

NUCLEAR REGULATORY COMMISSION OVERSIGHT

HEARING
BEFORE THE
SUBCOMMITTEE ON
CLEAN AIR, WETLANDS, PRIVATE PROPERTY AND
NUCLEAR SAFETY
AND THE
COMMITTEE ON
ENVIRONMENT AND PUBLIC WORKS
UNITED STATES SENATE
ONE HUNDRED FIFTH CONGRESS
SECOND SESSION

JULY 30, 1998

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NUCLEAR REGULATORY COMMISSION OVERSIGHT

THURSDAY, JULY 30, 1998

U.S. SENATE,
COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS, ,
SUBCOMMITTEE ON CLEAN AIR, WETLANDS, PRIVATE
PROPERTY AND NUCLEAR SAFETY,
Washington, DC.

The subcommittee met, pursuant to notice, at 9 a.m. in room 406, Senate Dirksen Building, Hon. James Inhofe (chairman of the subcommittee) presiding.

Present: Senators Inhofe, Allard, Sessions, Hutchinson, Lieberman, and Chafee [ex officio].

OPENING STATEMENT OF HON. JAMES M. INHOFE, U.S. SENATOR FROM THE STATE OF OKLAHOMA

Senator INHOFE. The subcommittee will come to order.

Today's subcommittee hearing will focus on the Nuclear Regulatory Commission. This is the first oversight hearing that we have held on the NRC in over 4 years. I know that we have many issues to cover. This is kind of a pivotal point in our history. We haven't been able to focus on the NRC as much as we should since I've been chairman of this committee, primarily because of the fact that we have had to concentrate on the ambient air and wetland problems. There hasn't been time to get into this, but I think this is a subject that has been neglected.

In order to encourage growth in the industry, and this is coming about at a very important time that I think when we talk about the problems and we've been going through this thing of ozone and particulate matter and yet we have a way to produce energy that is clean and it is one now that I think we need to concentrate on. I recognize that it's going to take several years before we're able to really grow in this industry but our country does rely on nuclear energy for 20 percent of its electrical generation right now. If people are concerned about reducing air pollution, then they must admit that we need a viable nuclear industry and we must begin encouraging the development of new nuclear facilities.

So I think that this is a very appropriate time to have this meeting. There some things, some criticisms that I have heard in terms of the performance of the NRC and yet right now, the NRC is about to take on its most challenging task in years, the relicensing of plants, and I'm doubtful that they are currently up to the task and decisions sometimes take too long and never seem to come to a conclusion.

I'd like to cite two examples which I'll be asking for responses at the time we have questions that I believe we are somewhat out of control in the regulatory process. The first involves the transfer of a license for Plant Vogtle, the company which owns the facility and transferred ownership from one subsidiary to another. It didn't really change, it changed from one subsidiary to another. All the personnel remained unchanged and the only change is on paper. This process took 4-1/2 years.

The second involves the proposed uranium enrichment facility in Louisiana where a company 7 years and \$30 million trying to license a plant before giving up. The facility would have used well-known technology that has been used in England for 20 years. This should have been routine.

Both of these examples cause me great concern and to begin the licensing renewal process, if the NRC and the licensing boards take this long for these cases, then I'm convinced that unless some drastic changes are made, the relicensing process is doomed before we begin.

We'll have a good hearing today. I'm pleased we have several members here and of course we have the Chairman of our parent committee, Senator Chafee. I will recognize Senator Chafee at this time.

[The prepared statement of Senator Inhofe follows:]

PREPARED STATEMENT OF HON. JIM INHOFE, U.S. SENATOR FROM THE STATE OF OKLAHOMA

Today's subcommittee hearing will focus on the Nuclear Regulatory Commission. This is the first oversight hearing we have held on the NRC in over 4 years and I know that we have many issues to cover today.

We are at a pivotal point in the history of the nuclear industry. We have a mature industry that over the years has provided safe and environmentally friendly energy, much to the dismay of its biggest critics. As we begin the twenty-first century, the industry is beginning the relicensing process for their permits. Just this year the first two nuclear plants have filed for a license renewal. Because of this, the NRC is also at a pivotal point in its history, and we must determine if it is capable of functioning in the next century or if it needs an overhaul of its structure and function.

Over the last year and a half this subcommittee has spent the majority of its time in Clean Air oversight, debating ozone, particulate matter, and regional haze. Today we are examining a fuel source with basically zero emissions. Our country relies on nuclear energy for 20 percent of its electrical generation and if people are concerned about reducing air pollution then they must admit that we need a viable nuclear industry and we must begin encouraging the development of new nuclear facilities. I am a realist, I do not expect any new plants to begin construction in the next five years, but we must begin to reform our regulatory process in order to encourage new facilities in the next five to twenty years. If we do not begin today, then we will never achieve the pollution reductions many want without sacrificing our nation's economy.

In order to encourage growth in the industry we must reform the NRC. We will hear a number of "buzz" words today on how the NRC is reforming: phrases such as "risk-informed, performance-based standards", "stakeholder input", and "performance indicators". The trouble is these terms have been tossed around for years and we have seen no real change at the NRC. I am interested in hearing from the Commissioners and other witnesses on how we can ensure that real change will take place.

The NRC is about to undertake its biggest task in years, the relicensing of plants, and I am doubtful that they are currently up to the task. Decisions at the Commission take too long and sometimes never seem to come to a conclusion. I would like to cite two examples which I believe show an out-of-control regulatory process.

1. The first involves the transfer of a license for Plant Vogtle. The company which owes the facility transferred ownership from one of its subsidiaries to another. All

of the managers stayed the same and all of the personnel stayed the same. The only change was on paper. This process took 4 ½ years.

2. The second involves the proposed uranium enrichment facility in Louisiana. The company spent 7 years and \$30 million trying to license the plant before giving up. The facility would have used well-known technology that has been used in England for 20 years. This should have been routine.

Both of these examples cause me great concern as we begin the license renewal process. If the NRC and the licensing boards take this long for these cases then I am convinced that unless some drastic changes are made, the relicensing process is doomed before we begin.

I hope today's hearing will begin to examine these issues and we can begin a process of this committee working closely with the Commission in the months ahead.

**OPENING STATEMENT OF HON. JOHN H. CHAFEE,
U.S. SENATOR FROM THE STATE OF RHODE ISLAND**

Senator CHAFEE. Thank you very much, Mr. Chairman.

I want to thank you and the Ranking Member for holding this hearing today. I share your concern that we've been so preoccupied with a host of other things—whether the Endangered Species Act, the transportation legislation or Superfund—that we haven't spent the time on this matter which you so wisely have chosen today to embark upon.

The Nuclear Regulatory Commission has an important mission and that is to ensure civilian uses of nuclear materials are handled in a manner consistent with the public's health and safety, environmental quality and national security. Increasingly, however, the question has been whether or not the NRC is carrying out its mission in a fair and thorough manner. Some, including industry, say the agency is overregulating. Others, including the GAO and other watchdog groups, say it is not doing enough. This kind of criticism is not atypical for a regulatory agency. I know Chairman Jackson is familiar with that. This is an agency that oversees a major component of the Nation's energy supply along with many other duties.

I hope, Mr. Chairman, today we can begin to make further steps to improve the effectiveness of the NRC so as to allow efficient industry operations while at the same time insuring public safety and these need not be mutually exclusive.

I regret that I can't stay for the whole hearing but I certainly am interested in this and want to commend you again for what you're doing. I'll be following it closely and appreciate what you've undertaken here.

Senator INHOFE. Thank you, Mr. Chairman.

Senator Lieberman?

**OPENING STATEMENT OF HON. JOSEPH I. LIEBERMAN,
U.S. SENATOR FROM THE STATE OF CONNECTICUT**

Senator LIEBERMAN. Thanks, Mr. Chairman.

I join you and Senator Chafee in expressing interest in this oversight process. Thank you for convening it. It was my pleasure for a period of time earlier to serve as chairman of this subcommittee and I appreciate very much the focus of the subcommittee on the NRC because it's a critically important agency of our government.

I can speak to you from personal experience from my own State of Connecticut which is recent experience about the NRC. We're just now emerging from what has been and certainly seemed like a long, 3-year nightmare with respect to our four nuclear power

plants which were all down. We went from having among the best run nuclear plants in the industry to having all of them being placed on the NRC's watch list of the most problematic plants.

During that time, I was supposed to do my own personal form of oversight of the NRC led by Dr. Jackson and I must say I've been impressed. The NRC undertook one of the most extensive safety reviews ever of one of the plants which is known as Millstone 3 and just this month the plant received approval to restart.

The Chairwoman has also committed that there will be extensive, continuing oversight of the Millstone 3 operation and that review of Millstone 2 which is the next target of inquiry will be equally intensive before any decision to restart is made. Those two commitments mean a lot to the people of my State and to me.

In addition to the extensive and intensive nature of the review of the nuclear power plants in Connecticut, I do want to put on the record here my appreciation that the NRC process was a very fresh and open one. Dr. Jackson came to the State, spoke to the residents who lived near the plant, the workers at the plant, listened to them and made clear in every instance that she had one overriding responsibility which was to ensure that only safe nuclear power plants would be allowed to restart in Connecticut.

In that context, I have watched the NRC come under recent criticism both from some within the industry and some within the Senate for what is described as overregulation. Some critics apparently believe that the NRC seeks blind adherence with the regulations that don't have safety significance. And there are others in Connecticut and outside who think the Commission has been too soft on the industry. As Chairman Chafee said, that's the nature of the process here in Washington.

Mr. Chairman, I am a supporter of nuclear energy and I say that here and add that I am a supporter because I think it is not only part of our current balanced American energy policy but should be, and ultimately I think will have to be a part of the future balanced American energy program for reasons for energy independence as well as environmental protection, including working to inhibit the onward movement of global warming.

In order for there to be a place for nuclear power in America's energy future, it's critical that we have a regulatory operation that gives the public and those of us who serve the public reason to maintain confidence in the safety of nuclear power. That's why I think a strong and effective NRC is so important.

I'm interested in the testimony today but certainly in my recent experience in Connecticut with the Commission, I don't see reason to conclude that the current NRC overregulates or inspects or enforces too much, or it has adopted an overly restrictive body of regulations. In fact, the fear in Connecticut, until the recent experience, has been just the opposite.

I think with the new safety initiatives undertaken under Chairman Jackson, the NRC has moved toward regaining some of the public confidence that is so important. Those initiatives include limiting inappropriate use of enforcement discretion, requiring utilities to verify whether they are operating in accordance with their design basis, undertaking review of NRC oversight of changes made by utilities without prior NRC approval, improving the in-

spection process, paying increased attention to the use of quantitative performance indicators and reforming the senior management process. In fact, for better or worse for Connecticut, I think many of those processes were direct responses to what happened to nuclear power plants in Connecticut.

I'd also mention something relevant, but somewhat parenthetical to that—I appreciated that the NRC recently voted in favor of requiring States consider the use of potassium iodide, which can protect the residents against cancer in the event of an accident, as part of their emergency planning. That ends a long fight which I was privileged to become involved with 4 years ago with our former colleague, Senator Alan Simpson who had long advocated that this would happen.

While the NRC has taken some important steps forward, obviously there's a need to continue improving its approach to safety. A couple of years ago I requested a report from GAO and I'm glad Mr. Chairman the representative of GAO will testify. It was forwarded in May 1997 and the GAO then raised serious concerns about instances in the past in which the NRC had neither taken aggressive enforcement action nor held nuclear plant licensees accountable for correcting their problems on a timely basis.

The GAO also criticized the NRC for problems in the inspection process such as not including timetables for the completion of corrective action for not evaluating the competency of the licensee's plant managers as part of the ongoing inspection process.

The GAO also raised a concern that the NRC's regulations do not provide the public with specific definitions and conditions that define the safety of a plant and similar criticism has been raised by scientific groups.

To her credit, I do think Chairwoman Jackson has responded to most of the GAO recommendations positively and in a timely manner. Therefore, I look forward to hearing from her and the other witnesses today as we begin this effort to fulfill our oversight responsibility toward this important agency and hopefully to build public confidence not only in the operation of the plants that are providing power around the country today but to increase the confidence to a point where we might even contemplate building more nuclear power plants in America tomorrow.

I thank the Chair.

Senator INHOFE. Thank you, Senator Lieberman.

Senator Allard?

**OPENING STATEMENT OF HON. WAYNE ALLARD,
U.S. SENATOR FROM THE STATE OF COLORADO**

Senator ALLARD. Thank you, Mr. Chairman.

I would like to associate myself with your remarks and the Chairman of the full committee and what he had to say this morning.

I want to thank you for holding this hearing. There's been a directive from the leadership in the Senate that committees ought to be reviewing carefully those agencies under their jurisdiction. Obviously, you've taken that very seriously. I know a lot of chairmen in the Senate have taken the time to go ahead and do these types

of important reviews. So I think it's commendable to you that you've taken on this responsibility.

I'm anxious to hear both from the industry as well as the regulators. I want to see good science applied in the regulatory process. I've looked at what's been happening here in this country and I don't see much building of new plants, I see what we have on-line as aging plants so we need to watch carefully with aging technology because equipment wears out and there obviously is some opportunity with the wearing out of equipment for perhaps some increased risk. So I'm looking forward to this testimony.

I also want to see a balance so that the regulators don't get so carried away that they actually get too involved in the day-to-day operation that it becomes impossible to provide a fifth of the electrical energy that this country uses to meet its needs. Personally, I want to see a balance in the way we provide electricity to this country. I want to see a combination of natural gas, a combination of coal-fired and nuclear power plants and any other energy resources that we can get out there. The more diffuse we keep the industry so we don't have monopolies, I think the better off America will be and the better off we will be competitively.

So I'm going to listen carefully to this testimony because I want to make sure that we're not placing a regulatory burden on the industry out there that doesn't warrant it based on public health risks and perhaps some risk to the environment.

So, Mr. Chairman, I'm looking forward to the comments and appreciate having an opportunity to serve with you on this committee.

Senator INHOFE. Thank you, Senator Allard.
Senator Sessions?

**OPENING STATEMENT OF HON. JEFF SESSIONS,
U.S. SENATOR FROM THE STATE OF ALABAMA**

Senator SESSIONS. Thank you, Mr. Chairman.

I'd like to associate myself with the remarks I've heard so far. It seems to me without any doubt that nuclear power is a critical part of our energy needs in America. This committee you chair deals with clean air. We talk on a regular basis about how to reduce particulate and other matter discharges into the air as a result of our need to produce power. Nuclear power produces no discharges into the air; it is a clean source of energy and it produces 20 percent of the electric power in America.

We have no plans, it seems to me, whatsoever, to re-energize that source of power, we have no new plants that appear to be on the way to being on the way to being brought on line and as a result, we can certainly predict that we're going to have to be using more fossil fuels instead of nuclear energy. One of the reasons for that I think is a genuine perception among leaders in private industry that you're overregulated; if you try to build a new plant, the inspection process could be so burdensome that it could not be economical. Maybe there are other factors in making it economical also. I know there are in oil and gas and in prices.

I think we've got to re-energize this energy source; we've got to expect our Nuclear Regulatory Commission to be a positive force in developing ways to allow this Nation to continue to develop nuclear

power. The rest of the world is. All over the world, they're doing this. We're not doing it. We're falling behind. It will have the potential of degrading our air and I don't believe among reasonable experts there is disagreement about the belief that there is excessive regulation in some areas that provide no safety benefit. That is a genuine perception I've heard throughout.

I'm new to this body; I'm not an expert in nuclear energy. Just as a citizen, it seems to me quite plain, we ought to be expanding our nuclear program like the rest of the world rather than having it dry up and disappear. I'd like to be a part of that. I think it's good for America. I think this Commission ought to be leading in that regard.

Mr. Diaz, I appreciate some of your remarks. I just read your testimony and I share much of what you say and I thank you for adding your comments to the Chairman's which I respect also.

Thank you, Mr. Chairman.

Senator INHOFE. Thank you, Senator Sessions.

Senator Hutchinson?

**OPENING STATEMENT OF HON. TIM HUTCHINSON,
U.S. SENATOR FROM THE STATE OF ARKANSAS**

Senator HUTCHINSON. Thank you, Mr. Chairman.

I have a longer statement I would like to have included in the record without objection.

[The prepared statement of Senator Hutchinson follows:]

PREPARED STATEMENT OF HON. TIM HUTCHINSON, U.S. SENATOR FROM THE STATE
OF ARKANSAS

Thank you, Mr. Chairman. I would also like to extend my thanks to the panel members for taking time out of their busy schedules to be with us. I am extremely pleased that we are having this hearing today. Everyone here knows of the great importance of the Nuclear Regulatory Commission, and I believe that it has been far too long since we have taken a close look at what is working well at the NRC and what we can improve upon.

I see today's hearing not as an end in and of itself, but as a starting point for dialog and reform that this Subcommittee and the entire Congress will continue to follow up on in the future.

Accounting for approximately 20 percent of the nation's electric power generation, nuclear power is generated in all but 18 states. In my home state of Arkansas, nuclear power accounts for nearly a third of all electricity generated.

Nuclear power has the potential to become even more important to the United States in the future. While scientists remain divided as to whether human activities are causing global warming, it is clear that nuclear power would be a, if not the only, viable alternative to fossil fuel generated power. Currently we derive 55 percent of our electricity just from coal and any shift away would require an increase in output from another source. The experiences of countries such as France and Sweden demonstrate that nuclear power could fill this void.

As the independent agency charged with ensuring the safety of nuclear plants, the NRC plays a vital role in nuclear power generation. Because of the great importance of nuclear power and the obvious need to maintain stringent levels of protection and safety, I am deeply concerned about the manner in which nuclear plants are currently being evaluated. I am worried about reports that assessments of nuclear plants are not being administered in a consistent and objective manner.

When assessments are made not on the basis of objective criteria, but on subjective and arbitrary measures, the very ability to the NRC to tell the difference between a safe and unsafe plant is called into question.

I believe we must do all we can to ensure that nuclear power is generated in a safe manner which protects the health of the public. I am not in favor of any relaxation or easement of safety standards. Quite to the contrary, I believe that nuclear plants should be required to maintain an extremely high standard of safety. The

NRC must do a better job, however, of assessing plants in a consistent and fair manner.

One of the most often heard criticisms of the NRC is that decisions take entirely too long to be made. I looked up the Nuclear Regulatory Commission in my U.S. Government Manual, and found that one of the Congressionally charged duties of the NRC is to make "timely regulatory judgments".

I understand that in response to recent criticisms the NRC has been examining ways in which it can do better job of regulating the nuclear industry. In testimony submitted for this hearing Chairman Jackson states that the NRC agrees that it must become more efficient and accelerate the pace of decisionmaking. I commend the NRC for its willingness to consider new ways to improve itself. I would caution, however, that such openness to criticism is meaningless, unless real change actually occurs.

I am confident that with the input of the NRC, the nuclear industry, other interested groups and of Congress, we will be able to effectively address those problems that will be discussed today. Again, I would like to thank the Chairman for calling this hearing today and I look forward to hearing the testimony of the witnesses.

Senator HUTCHINSON. I also want to commend you. I think it's been far too long since we've taken a close look at the NRC, what's working and what's not working, where we have improvements and I think you deserve a lot of credit for calling this hearing.

I see today's hearing not as an end in itself but as a starting point for dialogue and reform and that this subcommittee as well as the entire Congress will need to follow up and continue these efforts in the future.

As the Senator from Alabama said, one-fifth, 20 percent, of our Nation's energy is generated from nuclear power. In my home State of Arkansas, it's one-third which is quite amazing that one-third of all the power generated is from our nuclear power plants.

As the independent agency charged with ensuring the safety of nuclear plants, the NRC I think plays a very vital role and because of the great importance of nuclear power in this mix of our energy generation of this country, it is essential that we maintain stringent levels of protection and safety and that the public feel confident that nuclear power is in fact safe and that they can live in the vicinity of a power plant and know that their lives and the lives of their children are not endangered.

What I'm concerned about is the manner in which nuclear plants are currently being evaluated. I'm worried about reports that assessments of nuclear plants are not being administered in a consistent and objective manner. When assessments are made not on the basis of objective criteria but on subjective and arbitrary measures, the very ability of NRC to tell the difference between a safe and unsafe plant is called into question.

I think we must do all we can to ensure that nuclear power is generated in a safe manner which protects the health of the public safety. I want to emphasize that because I think when Senator Alard and Senator Sessions—and I didn't get to hear the Chairman's comments—but when we talk about our concern about how enforcement and regulations are being applied, that we immediately are sometimes placed in the category of wanting to deregulate or to somehow make these standards less stringent. That's not at all what I'm talking about.

I believe we should not relax easement of safety standards. I think nuclear plants should be required to maintain an extremely high standard of safety. The NRC must do a better job of assessing plants in a consistent and fair manner and in an expeditious man-

ner. One of the most often heard criticisms of the NRC is the decisions take entirely too long. I looked up the Nuclear Regulatory Commission in my United States Government Manual and found that one of the congressionally-charged duties of the NRC is to make 'timely regulatory judgments.' That is the charge; that's what we mandated.

So I think consistently, having objective criteria and making these decisions expeditiously are areas I'm concerned about and that I think this subcommittee must look closely at. I'm confident with the input of the NRC and the reforms that are already being implemented, we can not only reassure the public about safety but we can also ensure the industry that they can expect to have consistent, objective criteria and expeditious decisions from the Commission.

Thank you, Mr. Chairman.

Senator INHOFE. Thank you, Senator Hutchinson.

While I appreciate the comments and praise that we're having this, I frankly admit this is long overdue. I think this committee has been so busy. You know, here in Washington, we always put out the biggest fire first and there have been other bigger fires and we've gotten around to this one now.

Our first panel will consist of three Commissioners, our chairman and the other two commissioners. Since I want to be sure we get a full round of questioning, I'd like you to adhere to the time limit. We'll have the light system used for 5 minute opening statements because we want to get right to the questions in case some of our Senators have to leave.

I would mention that while some of the subcommittee members are not here, they are represented by staff. There will be questions submitted to all witnesses, the first panel and the second panel, in writing.

Let's start off with Chairman Jackson with your opening statement.

STATEMENT OF SHIRLEY A. JACKSON, CHAIRMAN, NUCLEAR REGULATORY COMMISSION

Commissioner JACKSON. Thank you, Mr. Chairman and members of the subcommittee.

The Commission is pleased to appear before you to discuss nuclear safety regulatory issues and the programs of the Nuclear Regulatory Commission, the NRC.

In recent months, as many of you stated, the NRC has been the subject of a number of external reviews, some of them sharply critical, from our congressional appropriations committees, the General Accounting Office, and other stakeholders. The critiques have not all been in one direction. Some groups have implied that nuclear energy has become economically burdened as a result of NRC over-regulation; others have cited the lack of NRC rigor in demanding adherence to clear safety standards and have demanded stronger NRC oversight of its power reactor licensees.

Whether or not one agrees with these observations, we believe that they do provide a useful opportunity to review improvements we already have put into place, to examine the initiatives we have started and to accelerate and adjust those initiatives and to ad-

dress newly-identified issues. That said, we also believe that given our regulatory health and safety mandate and given the nature of the industries we regulate, we must be careful and thoughtful but certainly not sluggish in analyzing, optimizing and accomplishing the needed changes to our processes.

The testimony we have submitted for the record summarizes this full spectrum of issues raised with our analysis and response. Most NRC observers are calling for a more rapid move through a regulatory framework that is more risk-informed with areas of highest risk receiving the greatest focus, and more performance-based, that is, more results oriented with licensee afforded more flexibility in meeting requirements.

The Commission has supported strongly and continues to support strongly this change in regulatory approach, and we agree that initiatives underway should be accelerated. Under our probabilistic risk assessment and implementation plan, we have published both generic and specific guidance to facilitate risk-informed plant changes through staff training, program reviews and stakeholder interactions. We continue to make our rulemaking, inspection, enforcement and assessment processes more risk-informed and where appropriate, performance-based. This will enhance our decision-making, improve efficiency, reduce licensee burden and provide a coherent and defensible framework for all of our functions.

In fact, we have invited the Nuclear Energy Institute, NEI, to submit to the Commission a petition for rulemaking outlining areas where it feels NRC regulations are duplicative, unnecessary in light of other rules or not sufficiently risk-informed. Similarly, our reactor oversight processes have been criticized for focus on issues of relatively low safety significance.

While we have, in fact, been working to improve each of these functional areas, we agree that additional enhancements are needed. We recognize the resource demands associated with NRC enforcement of low level violations and we are taking actions to simplify their disposition. We're nearing the completion of a full scope review of all of our reactor-related assessment processes that should improve their risk, focus and objectivity, enhance scrutability and reduce resource demands.

As we do so, we intend to interact strongly with NEI on a proposal recently submitted by them for a risk-informed, performance-based assessment process. We have taken measures to ensure that our more informal processes are subject to proper controls. The Commission also has taken strong action to streamline our licensing and adjudicatory processes.

Finally, observers have focused on our organization, management and self-assessment capabilities with specific suggestions for significant staffing and resource reductions. On these matters, let me simply say that the Commission has focused since late 1995 on ensuring a coherent, defensible and dynamic framework for strategic planning and resource management. We've used that framework to develop our strategic plan, performance plan and now program level operating plans.

Let me just say in summary that we are accelerating change where appropriate and necessary and we are working with our various stakeholders as we do so. We thank the members of this com-

mittee for the hearing, for the support they consistently provide to the Commission and for the opportunity for our perspectives to be heard.

Senator INHOFE. Thank you, Chairman Jackson.

Commissioner Diaz, did you want to make any statement or response? Your statement will be submitted in the record.

**STATEMENT OF NILS DIAZ, COMMISSIONER, NUCLEAR
REGULATORY COMMISSION**

Commissioner DIAZ. I would appreciate the opportunity.

Mr. Chairman and members of the subcommittee, I appreciate the opportunity to testify today. I have submitted a prepared statement which I would like to be included in the record. I will briefly summarize my testimony.

I believe there is a consensus for the need to change the United States Nuclear Regulatory Commission's licensing and regulatory framework and its implementation processes. This is not an indictment of the past, but a requirement of the present and a demand of the future. Why we should change is no longer the issue; the how and the rate of change are. The fundamental premise, and I believe the majority of stakeholders will agree, is that regulatory activities should have well-defined boundaries, be consistent and accountable, and result only in necessary burden. It is our job to assure adequate, requisite safety but not to impose requirements beyond this envelope of adequate safety without the most rigorous consideration of costs and benefits.

The task of establishing defined regulatory boundaries that reflect and accommodate application of risk insights could have been very difficult a few years ago, but the changes made by industry, the advances in risk methodologies and information technology, and yes, the pressures of the marketplace now make this task possible and needed.

The fundamental changes that have been envisioned can occur and must occur, and they should be timely. Many are now taking place. Some started years ago and others recently. There is no doubt that the oversight process the Congress has undertaken has rapidly accelerated change. I might digress here by stating that I am not requesting monthly oversight hearings but the compound effect of the inquiries, criticisms and recommendations from multiple sources has been healthy and is appreciated.

I assure you I will work to preserve the functional core of the agency and work to change what is needed. I do understand the bottom line is results, results, results. I look forward to the opportunity to return here with results.

I appreciate the opportunity to present my views. I would be pleased to answer any questions that you may have.

Senator INHOFE. Thank you, Commissioner Diaz.

Commissioner McGaffigan?

**STATEMENT OF EDWARD MC GAFFIGAN, COMMISSIONER,
NUCLEAR REGULATORY COMMISSION**

Commissioner MCGAFFIGAN. Mr. Chairman, I don't have prepared remarks, but I might respond to opening remarks of some of the Senators very briefly.

I very much appreciate the oversight hearing. I think such hearings are very useful. I came out of the Armed Services Committee where I worked for Senator Bingaman and with several of the members of this subcommittee. As you know, the Armed Services Committee conducts very thorough hearings on the Department of Defense and the Department of Energy.

I'd like to agree with the Chairman that we face some major challenges as we go forward in that our adjudicatory hearing process has not worked well in the specific instances that you cite. The challenge is even larger in some ways than you allude to because not only are we faced with relicensing, but next year we expect the U.S. Enrichment Corporation will apply for an atomic vapor laser isotope separation enrichment plant and we will face a very major challenge there.

We have requests for license transfers coming forward, Three Mile Island's transfer from GPU to Peco. We will license the high level waste repository either under current law or any new law that is passed. So we face major challenges and we are trying to face those challenges within the legal framework that we have, but in all honesty, in the case of the enrichment plant, for example, we have no flexibility but to conduct a very likely long and resource intensive adjudicatory hearing because Section 193 of the Atomic Energy Act specifically requires an adjudicatory hearing.

We have strengths as an agency, and Senator Lieberman referred to one of them, the openness of this agency. I think it is a tremendous strength. Senator Allard referred to another one of our strengths, which is that we are well-founded in science. I think that the agency has a tremendous repository of knowledge on the issues. We sometimes get into arguments with our sister regulatory agency, the EPA, and we generally argue, as Senator Lieberman knows, that our science is well-founded on those matters.

With regard to the issue of excessive regulation and regulatory reform, that is an issue, not just for our agency, but really across government. It is very difficult to make regulatory reform a priority. I was involved in working for Senator Bingaman in partnership with Senator Wallop on the Section 800 requirement, which led to regulatory reform in the procurement system. It was very hard to get the Pentagon to come forward with proposals to fix itself. We eventually went to another body, Admiral Vincent chaired it and in 1993, we got recommendations and in 1994-1995, Congress passed far-reaching reforms. So self-criticism is hard; making regulatory reform a priority is hard.

I think the approach the Chairman has outlined of trying to get a very significant petition for rulemaking from the Institute that we would then give high priority to makes sense. There were attempts made in the Reagan Administration and the Bush Administration and in the Clinton Administration towards regulatory reform and I think the results have been less than you would have liked, than we would have liked, than I would have liked.

Finally, with regard to evaluation and the consistency of the evaluation of our plants, we are trying to improve our assessment of plants but as a general defense of where we are and the openness of our process, I think we do very well and generally our plant evaluations are very consistent within INPOs. You'll hear from

INPO later, the Institute for Nuclear Power Operations. And we are very open, going back to Senator Lieberman's point, in discussing these assessments.

Are they perfectly objective? Can I justify why each plant gets the number it gets? I think the staff can but there is some subjectivity there. We can do better, we will do better, but we don't do badly, especially in comparison say with the FAA or other agencies which are often criticized for you not knowing where the licensed bodies stand vis a vis the regulator. You know where our licensees stand vis a vis us.

So I leave it with that and look forward to the questioning. As I said at the outset, I very much appreciate the chance to have the hearing.

Senator INHOFE. Thank you, Commissioner. I appreciate all your comments.

Ms. Jackson, in my opening statement, I talked about the very long delays that I didn't understand and I've talked it over with my staff in the case of the uranium enrichment in Louisiana about 7 years and the Vogtle operation, about 4-1/2 years, the latter being as near as I can determine only a name change because you had the same company, the same employees, the same parent company but just changing subsidiaries. I know there's such things as the whistleblower and some claims, but I'd like to ask you specifically how you react to these long delays?

Commissioner JACKSON. I think that as a group the Commission would clearly say that long, unnecessary delays in licensing proceedings, including license transfers, are unacceptable. I believe you know that none of the current members of the Commission were members of the Commission at the time of the Vogtle transfer. In addition, the LES, the Louisiana Enrichment Services proceeding was well underway and/or completed before we got here.

Nonetheless, I had asked our Atomic Safety Licensing Board to generate lessons learned, particularly relative to the Louisiana Enrichment Services proceeding because that overlapped with my tenure and the tenure of some of the Commission members at the NRC. I think what we have learned and what we are now intending to apply, particularly for license renewal, are these. That is, that we have an opportunity to be more clear, as clear as possible, up front on acceptance criteria and the information needed to reach safety decisions so that licensees can make high quality submittals to us and thereby minimize the number of interactions for review.

The Commission itself, because we have an inherent supervisory authority, needs to monitor its adjudicatory process more carefully, including setting reasonable schedules for decisions to be made and to have a process for the identification as early in the process as possible of policy issues so that it can give appropriate guidance.

Senator INHOFE. Madam Chairman, let me just say and I recognize, of course, that you folks weren't there but it's been my experience that when you have a commission that is in charge of its staff and perhaps in the staff there were some frailties there that caused the unnecessary delays, I just would want to know what plans you have to preclude that from happening again and what caused those, specifically answering that question.

Commissioner JACKSON. Well, what I'm trying to say to you is that there are a number of complexities in the particular case of the Vogtle license transfer that involved accusations of significant wrongdoing involving very high level officials in the company. My understanding is that the delays in the proceeding relative to the Vogtle license transfer had much to do with that.

Senator INHOFE. Yes, I understand, the whistleblower and that, but this is going to happen, isn't it, in almost every case that comes up, or in many cases, as it will?

Commissioner JACKSON. That's right and so what I'm saying is what the Commission has the opportunity and responsibility to do is to exercise its inherent supervisory authority over its licensing panels so that it doesn't happen and that specifically is what this Commission has taken steps to do.

Senator INHOFE. We are coming up with this license process and this is something that deeply disturbs me because we're talking about something that happens very 40 years and now I understand you already have applications in for a couple of license renewals some 10 years in advance. It's my understanding that the reason they're coming in 10 years in advance is they figure it's going to take that long to do it.

We're not talking about new companies. I think Senator Allard brought up a very good point about some aging machinery and things that might have to be looked at, but then again, it's not as if we're licensing for the first time.. How long do you anticipate the process to last for each renewal?

Commissioner JACKSON. We've set a schedule for the initial renewals of 30 to 36 months.

Senator INHOFE. Senator Chafee?

Senator CHAFEE. I'd like to just ask one quick question.

I missed part of your statement, Madam Chairman, but I would ask you as I understand, you asked industry for comments, what you could do to improve your operations from their point of view. Did you get those comments?

Commissioner JACKSON. No. What I've had discussions with the NEI about, in particular Mr. Colvin, is that I've invited NEI to submit a petition for rulemaking to the NRC to point out instances where they feel that we have regulations that are duplicative, unnecessary or not sufficiently risk-informed so that we can in fact focus on those areas and do a systematic review and use that as a mechanism to come out with a set of regulations that are more sharply focused, more risk-informed and are not duplicative.

I'm sure as you understand when you have an agency that is essentially the derivative agency of a 40-year-old agency, starting back with the Atomic Energy Commission when it had its regulatory side, there is a body of regulations that developed over time that are piecemeal. It's time for a coherent review of those regulations. I have always maintained that regulatory effectiveness demands that our regulations are risk-informed, that our regulations aren't duplicative, that they don't unnecessarily overlap. The issue becomes what is an effective mechanism to have that kind of systematic review.

Senator CHAFEE. I would think they'd take you up on your proposal. It seems to me to make sense. When did you make the offer?

Commissioner JACKSON. This specific one has come out of discussions that we've had with NEI in recent weeks. Nonetheless, I have consistently asked for strawmen. My point of view is the following. That if there are problems, then the easiest way to address them is to come up with solutions and solutions, to me, that are efficacious are ones that present proposals. That's what I call strawmen.

We've invited that with respect to our rule change on 50.59 which is the rule change that allows licensees to make changes to their plants without coming to the NRC first, as well as in a host of other areas. We're going to be interacting with the NEI on a proposal they recently advanced on developing a risk-informed plant assessment process. That should complement and dovetail with our own review of our reactor assessment processes, my point being that nothing focuses the mind like a concrete proposal. What form it comes out to be depends upon the interactions with all of our stakeholders but the challenge is to clearly identify regulations where there is a belief that there is not the safety benefit that they should have.

I have my own list but we believe that in an effort to be responsive, it is useful to have the industry itself come forward with some kind of proposals.

Senator CHAFEE. Commissioner McGaffigan?

Commissioner MCGAFFIGAN. Just one addendum to the Chairman, anticipating your criticism and explaining why I said what I said earlier, NEI will tell you the past petitions for rulemaking submitted to the Commission historically did not receive much priority and indeed languished for years.

What we are saying is if this petition for rulemaking comes in this time asking for significant reform, and I presume reform is necessary, that we will devote the resources necessary to getting the rulemaking done. As I said earlier, if you look at the historical record, we have tended to let such petitions, which have never been comprehensive before, but have been piecemeal, languish at the bottom of the rulemaking to do list. This time we intend to give it very high priority.

Senator CHAFEE. Thank you, Mr. Chairman.

Senator INHOFE. Thank you, Mr. Chairman.

Senator Lieberman?

Senator LIEBERMAN. Thank you, Mr. Chairman.

Dr. Jackson, I wanted to ask you, at the outset, just some baseline questions about nuclear energy in the country. Some of my colleagues have mentioned this 20 percent figure and I've used it myself in the past, which is that 20 percent of our electric power comes from nuclear energy. Is that about right?

Commissioner JACKSON. It's 20 percent of net electrical generation.

Senator LIEBERMAN. Twenty percent of net electrical generation in the United States comes from nuclear power. Today, how many plants do we have operating?

Commissioner JACKSON. 104.

Senator LIEBERMAN. How many are on your watch list at this time of those 104?

Commissioner JACKSON. Three involving five units, five reactors.

Senator LIEBERMAN. To say the obvious, the overwhelming majority of nuclear power plants in the country are operating in a manner that the Commission deems to be fairly safe?

Commissioner JACKSON. Let me make the following statement. Even plants that are on the watch list may be operating. We may have significant concerns in terms of erosion of safety margins or other issues that warrant increased agency attention, which is the reason they're on the watch list.

I think there has often been a misunderstanding of what the watch list means. The watch list was developed and, in fact, in response to congressional desires some years ago to ensure that the agency had a consistent way of focusing appropriate attention on plants that we deemed to have problems beyond the norm.

It is not meant to say that the given plants are unsafe to operate or that the margins have come to a point that they need to be shut down. There are some plants—there's only one—that remains where the Commission has said that it will remain shut down until the Commission as a commission decides to let it start up, and as you know, that's the Millstone Unit 2.

Other plants are shut down for various reasons, not under orders from the Commission and when they work through the issues, they will restart. They may or may not come off the watch list depending upon the overall performance and the attention the agency has to give, but your statement is true, there are 5 out of 104.

Senator LIEBERMAN. I appreciate that clarification. That's an important point because if you thought they were unsafe, they wouldn't only be on the watch list, they'd be shut down.

Commissioner JACKSON. Right.

Senator LIEBERMAN. In fact, that's what happened in Connecticut.

I want to ask you a question which I want to ask for a written answer because I don't know that you have it now and it's probably more detailed, which is I'd be interested in seeing a projection out 10, 20 years, going with the current 104, the number of nuclear power plants over that period of time that in the normal order of business, assuming no crises, will continue to provide power, and to that extent, if you can estimate what will happen to that 20 percent net electricity generating capacity over a period of 20 years?

In other words, some of the plants are obviously aging. We've had one of the four closed in Connecticut as you know that we've all decided—the company and yourself—that it's not worth opening, it requires too much to invest to get it back to a point where it's going to produce.

I think that would be helpful to me and I hope certainly to the committee.

[The additional information follows:]

The NRC does not make its own estimates or projections of the impact of nuclear plant shutdowns on the contribution of nuclear power generation to total electricity supply because the development of such estimates does not fall within NRC'S regulatory jurisdiction. However, based on data from the Internet site of the Energy Information Administration (EIA) of the Department of Energy, the following projections of nuclear capacity (i.e., total potential generating capacity) are available through the year 2020 for reference, high, and low cases:

Total U.S. Nuclear Capacity
(Megawatts)

	1996 (Actual)	2000(Proj.)	2005(Proj.)	2010(Proj.)	2015(Proj.)	2020 (Proj.)
Reference case	100,817	95,605	86,800	80,357	63,881	49,217
High case	100,817	97,635	95,555	93,525	86,800	80,357
Low case	100,817	92,653	63,811	49,217	22,154	2,320

The assumptions of the reference case include most plants operating until their 40-year operating license term ends, with some plants obtaining license extension and some shutting down prematurely because of economic or other conditions. The high case assumes that relatively more plants obtain license extensions and relatively fewer plants shut down prematurely. In the low case, there are relatively more premature shutdowns and relatively fewer license extensions. Thus, over approximately the next 20 years (i.e., given that the EIA projections are in 5-year increments, until 2015), U.S. nuclear generating capacity could decline by as little as 13.9 percent in the high case, to 36.6 percent in the reference case, to 78.0 percent in the low case.

Currently, nuclear generating capacity is approximately 14 percent of total U.S. generating capacity. If it is assumed that U.S. generating capacity from all fuel sources grows at approximately 1.5 percent annually to 2015, total U.S. generating capacity would increase from approximately 700 gigawatts in 1995 to 950 gigawatts in 2015. Using the EIA projections, nuclear power's contribution to total generating capacity in 2015 would range from 2.3 percent for EIA's low case, to 6.7 percent for the reference case, to 9.1 percent for the high case.

In terms of actual generation (i.e. total megawatt-hours generated), nuclear power plants currently constitute approximately 20 percent of total U.S. electricity generation. This is because nuclear plants are designed to be baseload plants and run most of the time; whereas some other fuel sources (e.g., natural gas) are used as peaking facilities to satisfy high demand periods and thus are not run as much of the year. With other factors being equal, the decline in nuclear generation as a percent of total U.S. generation would be closely related to EIA's projections of the decline in nuclear capacity. However, in recent years, average nuclear plant capacity factors have increased to about 75 percent. It would be expected that less efficient nuclear plants with lower capacity factors would be relatively more vulnerable to premature shutdown. Further, those nuclear plants that continue to operate may be able to increase their capacity factors further. The likely result would be that even though there will likely be fewer nuclear plants operating in 2015, those nuclear plants that remain in operation will likely be more productive. Although the NRC cannot project future capacity factors of the nuclear plants that it licenses, such an increase in productivity would tend to mitigate a decline in nuclear generation's contribution to total U.S. generation.

Senator LIEBERMAN. Commissioner Diaz, I noticed you heading toward the mike when I was talking. Did you have something you wanted to say about that?

Commissioner DIAZ. I was just going back to the issue of how many plants are going to be on line and licensed and the time that it takes to renew a license. I just want to make the point that I don't think the licensees expect a 10-year license renewal period.

Senator INHOFE. Say that again?

Commissioner DIAZ. The licensees, when they submit an application, they are not doing it 10 years earlier because they think it's going to take 10 years to do it. I think there is a major economical reason to do that, which is, before they undertake major repairs, upgrades that cost \$100-\$200 million, they want to make sure the plant will be able to be operated. So that is what brings the issue forward of the license renewal. It's a very important issue to the Commission which we are addressing, and an issue for the industry—the loss of lead time—that they have to attack. They can make major changes if they get the license renewal. They can

change steam generators, they can spend \$100 million but not if they do not have the license.

Senator LIEBERMAN. Yes, absolutely.

Dr. Jackson, during the recent appropriations process this session, it obviously became clear that there are people who believe the NRC has too many inspectors, or are concerned the NRC has too many inspectors and spends too much time on reactor safety.

I've heard you say that you're often asked why if nuclear safety performance is improving at plants as it is, there isn't a corresponding decrease in the level of NRC regulation and inspections. I wanted to ask you that question and ask you to respond to it at this time.

Commissioner JACKSON. First, what I would like to say is that there has been a net decrease in the inspection in the sense of the number of inspection hours which, over the last 4 years, have gone from 3,100 on average per plant to 2,500. We do have a formula for assigning inspectors to nuclear power plants which is the so-called $n + 1$ formula which says if there are n reactors at a site, they have $n + 1$ inspectors.

We're looking at the numbers but we feel that they have to come out of some key decisions the Commission has to make on what constitutes a risk-informed, baseline inspection program. In the end, nuclear oversight will always require inspection. The question becomes what do we inspect and how many resources do we need.

Today, we do adjust the amount of inspection to the performance of nuclear facilities, but we feel we can make more refinement and we intend to do that, but in the end, there will always be a risk-informed baseline inspection program.

If I may make an analogy to the airline industry, even airlines that have not had an accident in 20 years get a certain amount of baseline inspection, but the question is making sure that inspection is focused on the right things, risk-informed, and that we adjust the resources accordingly.

Senator LIEBERMAN. Thank you, Dr. Jackson.

My time is up. Thank you, Mr. Chairman.

Senator INHOFE. Thank you, Senator Lieberman.

Senator Allard?

Senator ALLARD. Thank you, Mr. Chairman. I'd like to follow up on my Connecticut colleague's questioning on the number of employees you have.

You're familiar with the Martin Report which was an assessment, I assume, of the NRC fiscal year 1995 budget estimates. In that report, what they did is they looked at the number of employees in France and Japan, combined that with the number of employees that we have here, and looked at the number of plants they had in those countries, plus their safety record and said, it looks like they're getting the same job done with half as many employees as you have.

If I was in your position, I think that would disturb me to a certain degree because I'd want to know whether everybody was performing for the job we're paying. I think those figures are rather remarkable and the fact they compared that to other countries who have the same number of nuclear power plants, and have the same

performance record or the same safety record, and went so far as to say you could save \$90 million with that.

I'm wondering if you have done a study. Maybe if you're not building new power plants, maybe you don't need people there that get involved in construction of new power plants. Maybe there is an opportunity for savings there. Have you looked at those kinds of areas? Have you looked at the qualifications of your inspectors? Maybe there is a need to do that.

Have you looked at your personnel file to see if you have somebody that once on board, how difficult is it to get them reassigned or to eliminate their position. I'd like to have your comment on that.

Commissioner JACKSON. Thank you for asking that question. Let me talk directly to this issue of comparisons between the Nuclear Regulatory Commission and its staffing levels and a sum of staffing levels with Japan and France. It is true that if you add up the number of nuclear reactors in France and Japan, you come out with roughly the same.

What we have said is that the comparison is not as simple as that because of the fact that first of all, in those countries, what you call the regulatory body is a very different body than what the NRC is, and let me explain that to you.

The regulatory body which may look very thinly staffed is supported in those countries by so-called technical support organizations, so that is No. 1.

Senator ALLARD. So they work closely with the industry and they do a lot of self-inspection? Is that what happens?

Commissioner JACKSON. No, it is not that. They actually have governmental technical support organizations which actually do the technical work. Then they have research organizations.

Senator ALLARD. And those were not included in the figures?

Commissioner JACKSON. They were not included in those figures.

Senator ALLARD. Did you try and bring those into the figures?

Commissioner JACKSON. Absolutely.

Senator ALLARD. Do you have a corrected number?

Commissioner JACKSON. I can provide you with a number but I got calls from my colleagues from abroad who read about some of this in the press and they said that's a comparison that you cannot make because there is a difference.

Senator ALLARD. Don't you think it would be helpful though to follow up and try and correct those numbers?

Commissioner JACKSON. I agree with you but I do believe there is utility in benchmarking how we handle our regulatory program with how other countries handle their's, but being mindful of commonalities and differences between not only the regulatory regimes but how those regulatory regimes are rooted in the legal and institutional framework of those countries.

Having said that, we are looking at our staffing as part of our strategic assessment and re-baselining. We've been looking very broadly at our core competencies and key skills. We've had a specific study done of our inspection—it's called a job task analysis. We also are going to do a more comprehensive review of our inspection program beginning this fall.

Nonetheless, we are doing and planning to make targeted reductions in certain areas and/or reassignments because as plants shut down and decommission, the nature of the work changes. So we have some opportunities in that regard.

Again, I would just say, and I'll be happy to provide the best figures that I can dig up, that the strict comparisons to what is called the regulatory body to the NRC, one has to be careful.

The final comment I would make is that our range of responsibilities encompass more than the regulators do in other countries; what they do and what they're required to do under the law is very different.

Senator ALLARD. It would be helpful to me if you could get to this committee just what your scope of responsibility would be in comparison to these other countries.

Commissioner JACKSON. I would be happy to provide that.

Senator ALLARD. I think if you're at that place where you've got a great opportunity to upgrade your work force, take those that are nonperforming employees and take those that are perhaps not as qualified and you take your more qualified and move those into your most needed positions, your most responsible positions and take those that are less qualified and nonperforming and get rid of them.

Commissioner JACKSON. Let me say this quickly. We have a very high quality work force. Nonetheless, there's always opportunity for improvement. In fact, one of the initiatives that has occurred coming out of a reorganization that we had a couple of years ago is also a revamping of how we do a performance appraisal, consistent with the laws of the government, but particularly with respect to managers. So we're doing a lot of that. It's less obvious and transparent than some other things because you're dealing with personnel policy, but I appreciate your comment.

Senator ALLARD. Mr. Chairman, my time is running out, but I'd like to give the other Commissioner an opportunity. He's been looking to respond to my question, I'd like to give him the time to do that.

Commissioner MCGAFFIGAN. If I could just very briefly comment on Senator Allard's question about the Martin Report. In France, one of the countries that the Martin Report compared us to, there is a recent report of a member of Parliament, and apparently there is going to be legislation later this year reorganizing France's nuclear regulation, but the press reports I saw—I think it's Monsieur Le Deout's report—may tip the balance in the other direction. We may be cost effective compared to the French once you do an apples and apples comparison of what he is proposing. He is now bringing everything together into one regulatory body that looks more similar to us.

So once this reform is completed in France later this year, we may look cost effective compared to the French, is the first point.

Point two on the quality of our personnel, I want to second the Chairman. I had a lot of experience overseeing the Department of Defense and the Department of Energy's nuclear programs over many years working for Senator Bingaman and I would compare our staff to DARPA's which I think is one of the best staffs in the Pentagon.

We have very effective, very dedicated civil servants with very high technical credentials. The question we have to address is how to best utilize those credentials going forward, but I think we need them to meet all the challenges that we face, not that we haven't made reductions and won't continue to make reductions to adjust to budget realities and to adjust to workload realities. We have very, very good people. The challenge I think we face is managing them well and getting on with things like this rulemaking that's required and speeding up our processes.

Senator ALLARD. Thank you, Mr. Chairman.

Senator INHOFE. Senator Sessions?

Senator SESSIONS. A little bit on that point, according to the study you referred to, in England, there was 5.7 inspectors to 1 plant where we're at 14.5. That's closer to three times as many.

I would just encourage you because it's not easy. I took over the Attorney General's Office of Alabama in 1994 and we faced a budget crisis and the hardest thing I ever had to do was to terminate the employment of 25 percent of that office the day I took office and we still hardly managed to balance the budget, and we did more quality legal work, everybody reorganized, rethought, challenged ourselves, and I couldn't have been more pleased.

I would just say to you, as you indicated, this is a 40-year-old process, it's built up, you've got regulations, some of which no longer are relevant. You're saying the things that I think are right. We want to help you, we want to see you move this to a lean, effective, rational, scientifically-based review process that will not only allow the industry to function and keep the rates as low as possible, but perhaps will allow us to bring on more plants in the future.

With regard to that, Chairman Jackson, let me ask you, what prospects do you see in this country that we can have the rebirth of the nuclear industry and the building of some new plants? What prospects are there?

Commissioner JACKSON. Let me state for the record that I am a supporter of nuclear power. In fact, I was on the board of a nuclear utility company for 8 years before I came to this job and that gave me some perspective, not the ultimate perspective but some perspective in terms of some of the thinking.

I think what will affect the future course of nuclear power—I never make predictions about absolute numbers. I think that's dangerous as the Chairman of the Nuclear Regulatory Commission, but I think we have three opportunities before us.

One is license renewal. Why license renewal? Because it allows licensees to get the maximum return out of their already sunk investments. It also is what I would call a confidence builder, confidence relative to the industry itself in terms of the future of nuclear power, but confidence in the regulatory process, that we can in fact do a timely but effective review of renewal of a license. So I call that a gating function.

The second key opportunity relates to the fact that we do have a new regulation, Part 52, for streamlined licensing of new reactor technology and it includes as part of that, prior certification of the designs of more evolutionary, advanced reactors. We have, in fact, design certified two new reactors, one designed by General Electric

and one by ABB Combustion Engineering. We're in the process of doing the final design approval on a Westinghouse design which we expect to have done by the end of the third quarter of this year.

What's different about that is that it allows for one step licensing, the issuance of a combined construction and operating license at one time provided what's built is one of these certified designs. I think what we're putting into place for license renewal will allow us to propagate the lessons learned into licensing a new reactor design.

The third opportunity, but it's a problem today, has to do with resolving the high level waste issue. If we can do that, then I think these are what I call the top three.

Senator SESSIONS. I think we can do that. I think we probably ought to be removed from office if we can't take nuclear wastes and store them safe in this country. That is, to me, beyond rationality, if this Government can't find a place to store spent nuclear materials is beyond belief. So I think we can solve that problem or we all ought to be removed from office, it seems to me.

You really didn't kind of answer my question. I think you're right that we need to have some standard design approval so that a company can reasonably expect that their plant, once built, will be approved because we do have plants that have had problems in that regard, but what is the prospect? How many plants now are on the drawing board moving toward development in the United States at this point?

Commissioner JACKSON. There are three advanced reactor designs. To my knowledge, no utility or power company is moving toward specifically applying to license the construction and operation.

Senator SESSIONS. That means the whole agency is going to be kaput pretty soon if we don't build a new one and all of them have to be shut down, they have a life span. That is a serious concern, isn't it—20 percent of our power that produces no air pollution is heading to extinction.

Do you consider that the NRC has any role in the future to try to develop ways we could make nuclear power feasible here where other countries apparently find it is?

Commissioner JACKSON. As you know, the NRC's role is legally or statutorily not promotional. Nonetheless, picking up on your earlier comments, I believe that the NRC's role in facilitating the safe use of nuclear power in this country has to do with having an efficient, timely, risk-informed, performance results-oriented and fair regulatory process as the key elements.

That is what you're looking for from us and this is what our standard is for ourselves. I believe this Commission is committed to making a change.

Senator SESSIONS. I hear you saying that you're not worried about that and that's not a function—you don't have a staff on board studying this phenomenon of no more plants and developing any thought to it as to what we ought to do?

Commissioner JACKSON. The decision to build the plants is going to come out of business decisions.

Senator SESSIONS. But the agency itself does not have a team that's analyzing this problem and proposing any solutions to it?

Commissioner JACKSON. Our way of having a solution is to do our job in the way that is as least burdensome as possible, is risk-informed, is timely.

Senator SESSIONS. I respect that.

Senator INHOFE. Thank you, Senator Sessions.

We do have another panel. I think since we're down to three Senators, I'd like to do one more round. We will be having to vacate this room at 11:45 a.m., so we want to give adequate time for our next panel and I've completely rewritten all my questions for them after hearing this testimony here.

I think we've already accomplished a great deal today and I appreciate your response of 30 to 36 months on your license renewal plan. I would like to ask would it be unreasonable to ask you to supply us with a detailed license renewal plan by sometime this fall?

Commissioner JACKSON. I would be happy to do that because we've done integrative planning for both the technical reviews and the adjudicatory process.

Senator INHOFE. All right. Thank you very much.

I'm concerned also about the streamlining. I don't mean this critically but when I saw your testimony come in and it was 80 pages long, I thought it might be kind of difficult to streamline anything around here.

Commissioner JACKSON. That was the streamlined testimony.

[Laughter.]

Senator INHOFE. Commissioner Diaz, I'd like to read to you a statement that was made by former Commissioner Remick, "You"—meaning the NRC—"are seen as having lost focus and perspective on what constitutes safety and adequate protection of the public and are striving instead to duplicate industry's initiative of seeking excellence in plant operation. You speak of striving to be risk-informed and you speak of the need for performance-based, regulatory implementation but little impact is seen in the field." Is Dr. Remick correct?

Commissioner DIAZ. He's reasonably correct. I would say that there has been a change in the last year. We have accelerated significantly our emphasis on one part of that statement which is risk-informed regulations.

We can do risk information much easier across the board of many of our activities than we can do performance based. It is possible that in the last few years, a bit of the focus on safety was lost and emphasis was put in areas of what we call compliance, meaning that the processes became so important, and the detail in the processes became overwhelmingly a concern for the agency.

I believe that the Commission has taken the necessary steps to stop that from happening. This is an issue that has been called safety and compliance. I think that's now better defined. I think that the agency—and I believe I speak for all my colleagues—have now placed "risk-informed and performance-based" on a separate basis so they can be dealt with as the circumstances permit. That's an important thing.

Senator INHOFE. Thank you, Commissioner.

I'd like to have a reaction from the rest of you but I'm going to go ahead and read a couple of other statements. If you would make

some notes and give us your response. This is from Dr. Pate, former head of INPO.

He said, "Headquarters and regional personnel routinely every day and indeed every hour impose requirements on the plants that the Commission or other senior managers would not support if in each instance you knew what was happening."

Further from Commissioner Remick, "To be blunt, the Commission does not know in detail how the agency's programs are being preformed in the field. The over emphasis on blind adherence to strict compliance in every confusing regulation and strict compliance with documents never intended for that purpose is, in some cases, diverting attention from more safety related activities." Anyone want to respond to that?

Commissioner JACKSON. Let me talk about some specific steps that the agency has taken with respect to what many perceive as an apparent disconnect between headquarters or Commission expectations and what goes on in the field. I'd like to preface what I say by reiterating an earlier statement which is that NRC has a very focused and dedicated staff. The job for the Commission and the senior managers is to provide the appropriate leadership.

We have given increased focus to providing appropriate guidance, appropriate training of our people in the field and particularly management oversight and leadership. That is what needs to happen.

If I may take one additional moment, the Commission promulgated a statement on safety and compliance because there were discussions in the agency of safety versus compliance, and for a regulatory agency, that doesn't make sense. I've always said that if we have regulations or requirements that don't make safety sense, we should change them. It's our job to do. If the industry is aware of them, they should do it.

I just have one minor correction to what my colleague, Commissioner Diaz, says. We have accelerated a number of things within the last year but 3 years ago, the Commission directed the staff to develop specific regulatory guidance documents on the use of probabilistic risk assessment, regulatory decisionmaking, to use them to review pilot submittals from our licensees on risk-informed changed to in-service inspection, in-service testing, technical specifications, as well as graded quality assurance.

So there is a comprehensive program underway. It has been underway since before my time. It has gotten sharper focus and acceleration recently.

Senator INHOFE. Would you like to respond to that, Commissioner Diaz?

Commissioner DIAZ. Just briefly. I completely agree that Chairman Jackson started an overlaying program that should provide this but the gist of what you read was right. Where there are problems in emphasizing compliance or safety, I think the answer has to be yes. Are we aware of it? Yes. Are we responding to it? Yes. Do we expect that we will be able to fix it? I believe the answer is yes.

Senator INHOFE. Very good. I know my time is expired but I'd like to give Commissioner McGaffigan a chance to respond.

Commissioner MCGAFFIGAN. These issues that are coming up unfortunately are not new. Mr. Colvin, who is on the next panel and I'll help pave the way for him, used at the July 17 public meeting, his 1989 viewgraphs which he told us were on point for the 1998 Commission as well.

So I welcome the spotlight that is being shined on us, or the floodlight that is being shined on us. We need to make commitments to change and to be the agents of change. We have made some progress, but there are things we have to fix.

He'll talk about our enforcement policy and the Chairman's testimony talks about it but there are some things that have happened on our watch—this increase in nonescalated enforcement actions—that we need to fix and we've made commitments that we will fix and do it relatively promptly.

The final point I'll make is we need to move forward. Unfortunately, Mr. Colvin can use 1989 viewgraphs and they are still relevant in 1998. That means that something has gone wrong in the intervening 9 years that needs to be addressed.

Senator INHOFE. Senator Lieberman?

Senator LIEBERMAN. Thanks again, Mr. Chairman.

I do want to pick up for a moment before I ask a question on Senator Sessions' conversation with you. I do think there is agreement here across party lines at least on this subcommittee about what is really a pressing matter of national energy policy which is that no new nuclear power plants are being built in this country today and they are being built in most of the major industrial powers and the developing industrial powers such as China.

The reason for that I think is that it's more complicated than this but my own sense is that the most important reason for that is that the nuclear power industry has decided that the public will not support the building of additional nuclear power plants because of safety fears, the Three Mile Island era situation and to a certain extent, I suppose, Chernobyl where there is no real, accurate or fair comparison to our nuclear power plants and what was happening at Chernobyl.

That is where I think your work, the NRC's work, is so critically important, to restore public confidence in the safety of nuclear power. Then I think we have an obligation and the people in the industry have an obligation to go out and make the case to the public that we've got a source of power here that will help us to be more energy independent with all of the implications for our national security involved in that and in fact, will help protect our environment.

Okay, there were some mistakes made at an earlier point but you said it, 104 plants are operating today, they're operating safely. If they weren't operating safely, you would shut them down, which you did in Connecticut.

The other side of it is who forms the national energy policy and of course that is the responsibility, I believe, more of the Department of Energy and perhaps Administration officials generally than of the NRC. And it's our responsibility in Congress to help form that policy and in that sense to educate, inform and build a climate where we can see some of those standardized designs, big advance over the future.

We've got four nuclear power plants in Connecticut, each of them a different design. That complicates not only their operation but your responsibilities in ensuring their safety. So we're taking a critical step here in having at least three standardized designs.

I know there is some work going on over at the Department of Energy to encourage next generation nuclear power plants but I hope that one of the results of our oversight of NRC will be to have a broader understanding of why your regulatory authority is so critical not only to the safety of the current plants but to building a public constituency or at least public acceptance of the need for a next generation of plants and then the rest of it is up to the DOE and us, really, to make the case to the public.

On the question of safety, I want to come to a different point. There as a GAO report that Congressman Dingell and I requested a while back that reviewed the process at NRC and the Department of Labor for protecting whistleblowers and contained a number of recommendations for improving the process.

This whole nightmare we went through in Connecticut, part of it was the result of whistleblowers, the people who work in the plants who, in a sense—when I was attorney general of Connecticut, Senator Sessions was attorney general before—we used to have what we called the Private AG's Act, the sort of baby attorneys general where we'd give private litigants the authority to help us enforce the law. In a way, every employee in a nuclear power plant has the ability to assist in guaranteeing the safety of those plants and whistleblowers are a part of that.

I wanted to ask you what changes to the whistleblower protection system has the NRC made in response to the GAO report or your own evaluation and do you think there is any additional legislative authority you need to improve the rights and opportunities of whistleblowers to help you do your job?

Commissioner JACKSON. We've taken action at three levels. One is the policy level; the second is the functional level; and the third is on the legislative front.

At the policy level, the Commission itself issued a policy statement relating to the freedom of employees, it's expectations relative to the freedom of employees in the nuclear industry to raise safety concerns without fear of retaliation. We thought it was important to send a clear message in that regard, that people have the opportunity and the right to raise safety issues without being harassed and intimidated.

On the implementation side, we've taken a number of steps. There were a number of specific GAO recommendations related to protecting the identity of alleged and we've taken explicit process and management steps to do that. With respect to the tracking of allegations, we've implemented a new system using information technology to do better tracking of allegations. We've created the position of an agency allegation advisor who has a specific point of accountability with respect to allegation issues, but also has the responsibility to not just bean count but to extract what is safety significant. We then use that information as part of our senior management meeting and plant assessment process, not bean counting but what underlies the allegations.

We had a recent hiccup because of a conflict between the FOIA requirements and the protection of allegeders at one of the nuclear plant where some names were inadvertently released and that has made us step back and reinstitute certain management controls and have special document handling requirements for FOIA requests vis a vis protecting allegeders' identities, et cetera. So we've taken a number of very concrete steps in that regard.

Finally, we've been working with the Department of Labor to get them to transfer the treatment of harassment and intimidation cases from their Wage and Hour Division to OSHA and also working with them on legislation for methods to speed up the proceedings relative to harassment and discrimination cases.

Senator LIEBERMAN. I look forward to seeing the results of those inquiries and possible legislation when they are completed.

I want to thank you, Dr. Jackson, and Commissioner McGaffigan and Commissioner Diaz for the very important and I think extraordinary able job you're doing.

Thank you very much, Mr. Chairman.

Senator INHOFE. Thank you, Senator Lieberman.

Senator SESSIONS?

Senator SESSIONS. Thank you.

Senator Lieberman, you do suggest something that is a perception that I think is not really true and that is that people are terrified of nuclear power. Tennessee Valley Authority is seeking to bring on a Bellefont plant that was nearly completed and stopped because of various things a number of years ago.

Every city council, the county commissioners and everybody in that area is supporting bringing on that plant. We got almost no objection from the people who live within a significant radius of that community and they universally recognize the benefits of a clean nuclear plant, well-paying jobs, no truckloads of coal, no pipelines of natural gas, no pollution into the atmosphere. It's just a win-win prospect if it's economically feasible.

Chairman Jackson, I have one thing let's see if we can tie down a bit. You did say in your public hearing on July 17 at Rockville, a little self criticism on the endorsement process, "A number of our enforcement actions, for instance, frequently are not focused on what is safety significant and can serve unwittingly the misdirected purpose of misdirecting licensees' attention. There is a burden that we place on our licensees for relatively low level, non-safety significant violations and we need to look at that."

That is consistent with this report that has been referred to earlier where you've got an increased number of severity Level 4 violations which are the least significant violations and not the more serious ones.

I guess my question is—and we are behind you on this—will you take steps to deal with this and are you doing so now, and when can we expect results?

Commissioner JACKSON. Let me take the question in inverse order. I think you can expect results within the next 6 months. Yes, we are taking specific steps, particularly with respect to severity Level 4 violations in terms of how they are dispositioned and how much burden we place on our licensees to respond to them. The actual change, the staff is working on that and it has to come

to the Commission for its approval in terms of this change in how we implement our enforcement policy.

In addition, we had earlier but we see a need to enhance the connectivity between our various severity levels and consideration of risk significance. So we're taking specific short-term steps with respect, particularly, to severity Level 4 violations.

Having said that, it doesn't mean that there will not be those and it doesn't mean that we won't trend or track them because they can be, if one gets to the heart of them, precursors to the beginning of larger problems, but they do not need to be if they are not risk significant, the burden on our licensees that they have been. We want the plants safe, but we want the resources focused as effectively as possible. When you don't have new plants coming on line, which I could see would utilize a lot of people, and you've got mature plants with mature staffs, you should have less violations and probably need for less regulators.

Senator SESSIONS. Mr. McGaffigan?

Mr. MCGAFFIGAN. Senator Sessions, that's the point I made earlier in response to Senator Inhofe. The answer to your question is yes and soon and I hope we can do even better than the 6-months in terms of addressing this. Clearly, very little violations going up by a factor of three over the last 3 years doesn't make sense. We probably don't have the right threshold. Mr. Colvin will cite a few later with regard to books being left in the wrong place and if there were an earthquake, it might—we need to get out of citing those sorts of violations and focus on more significant things.

Senator SESSIONS. Mr. Diaz?

Mr. DIAZ. Senator, one problem you and Senator Lieberman referred to was public information and I didn't want to pass the opportunity to tell you that we are concerned and we believe that the Commission has a responsibility to present factual information to the public, that we cannot let information that does not reflect the safety significance of each use to be propagated and actually scare the people of this country.

A year ago, the Commission took steps to analyze how do we address this interface. We are now finishing or have finished the analysis and I'm sure my colleagues are looking forward to presenting a better way to deal with public information that is very responsive to the needs of the public.

Commissioner JACKSON. May I make just two additional comments?

What my colleague says is true. Coming out of our strategic assessment and rebaselining, we had a specific public communications initiative. There were certain points that Commissioner Diaz particularly brought up with regard to how the agency presents results of its inspections, assessments, et cetera that were folded into that, and we expect to see some major change.

We have an agency of engineers——

Senator SESSIONS. They don't like change? Lawyers don't like change.

Commissioner JACKSON. We have lawyers too.

My final comment is that it may be true, and it is true, that there has been a run-up obviously in the severity Level 4 violations, but interestingly enough they actually came out of steps

taken to correct a different problem. That problem had to do with consistency, consistency of documentation, consistency of what gets reported through inspections, consistency in approach from region to region. That had been a problem at NRC.

In doing that, coupled with the rising ability level of our inspectors and more of a focus in certain areas on compliance, has led to a run-up in these severity Level 4 violations. The Commission has been taking a look at that and I already outlined the steps the staff is taking to address that issue but we still have to maintain the consistency.

Senator SESSIONS. You have to be strong because established governmental agencies don't like change and you're going to have to be strong and we will back you. We expect some progress in this area since all of us agree that it is a problem and I hope that you can report soon that you have made progress.

Commissioner JACKSON. Thank you.

Senator INHOFE. Thank you, Senator Sessions.

I have one last question. I understand the meeting you had on July 17 was with industry and the purpose was to have a dialogue to bring out these problems. When was there one before that?

Commissioner JACKSON. We had a meeting earlier in the summer with NEI to talk about design basis issues.

Senator INHOFE. So you have had regular meetings with industry, this is not just a first?

Commissioner JACKSON. Well, we have meetings, public meetings, as a commission, sitting as a commission.

Senator INHOFE. No, I'm talking about meetings like the July 17 meeting?

Commissioner JACKSON. We don't always have Commission meetings with industry but industry representatives——

Senator INHOFE. Was this a meeting with industry?

Commissioner JACKSON. This was an open Commission meeting.

Senator INHOFE. You've been there since 1995, have you had other ones like this?

Commissioner JACKSON. We have had meetings on specific topics with industry, yes.

Senator INHOFE. I'm very pleased. We're going to be hearing back on specific things. I like the idea of the 6-months. Let me go ahead and announce right now that we will be having a meeting of this committee which will be 6 months from today, the 28th of January, to follow up. We look forward to seeing you and having a lot of streamlining and a lot of progress made at that time.

Thank you so much for taking the time to come and we'd now invite the second panel to appear.

I would introduce our second panel. We have, first of all, Mr. Joe F. Colvin, President and CEO, NEI; Dr. James T. Rhodes, Chairman and CEO, Institute for Nuclear Power Operations; Ms. Gary Jones, Associate Director, Energy Resources and Science Issues, GAO; Mr. David Lochbaum, Nuclear Safety Engineer, Union of Concerned Scientists; and Mr. Steven M. Fetter, Managing Director, Global Power Group.

Ladies and gentlemen, you heard the instructions to the first panel. We will have 1 hour and 5 minutes here and I know that we probably took too long for the first panel, but we have a lot of

things to ask you. If you could hold your opening statements to a minimum, hopefully we won't have to worry about the red light coming on.

We will start with you, Mr. Colvin.

**STATEMENT OF JOE F. COLVIN, PRESIDENT AND CEO,
NUCLEAR ENERGY INSTITUTE**

Mr. COLVIN. Thank you, Mr. Chairman.

I'll try to keep my comments brief.

We've had considerable comments about the important role of nuclear energy in the United States as it relates to energy supply and energy security, diversity and its emission-free basis. The point I'd like to make in that area is that as we move forward in our industry and as we move to a competitive electricity market, the most significant business uncertainty that we face from the industry standpoint is not the cost of fuel or other parameters as we go into competition, it's really the uncertainty of the regulatory process that we face. This is the safety regulatory process and the requirements that are imposed that really do not directly relate to public health and safety.

In response to Senator Lieberman's statement about the public and subsequent statements, we really see that 70 percent of the public at large supports nuclear energy both now and in the future in the United States and yet they are somewhat confused by the messages they receive from the media, from reports from the Nuclear Regulatory Commission and others which cause some uncertainty in this process. I think Mr. Fetter will likely talk about the uncertainty that causes within the financial community.

The second point I'd like to talk about is we have seen important change in the regulatory program, a program that has really evolved over 40 years. However, that change has not been effective in making the transition that needs to be made given the levels of performance in the industry.

While we see comments by this Commission and initiatives by this Commission, the reality is, as Mr. McGaffigan pointed out, I've testified before committees such as yours over the past 15 years and I've been involved in five previous initiatives with the Commission to effect change in these fundamental areas, and we really haven't seen that change.

That is why I think it is essential that this committee and you, Mr. Chairman, participate and support these changes that are necessary to correct these underlying cultural and fundamental issues that exist within the process. While we focus primarily on the discussion of regulations, the reality, in my view, is that the problem is not just with the regulations. It goes much deeper than that, and we have to look at how regulations are interpreted, reinterpreted and how they really are carried out by people in the field.

I think that there is an issue of burden of proof, issues of various documents and processes that are used that go outside the formal regulatory process, that really need to be looked at that would bring some stability within the agency.

I'd like to make three recommendations in this regard and I'll be happy to talk about these in more detail. First, we believe that this committee should reauthorize the agency's budget in 1 year incre-

ments until this committee and the appropriations committees are satisfied that these changes are being brought about.

My second recommendation, Mr. Chairman, you have already taken to heart, and that is that the NRC should regularly report to Congress, and you should continue to have oversight hearings. You've already scheduled the first one of those for early next year.

The last thing, which I think is a very important point and a point that was made by members of the Commission, there needs to be an independent review of the NRC's activities. I stress the word independent. As Commissioner McGaffigan indicated, we've been at this a long time, and there needs to be some fundamental change. It hasn't changed, and there needs to be an external look at how the agency does its business and how it can improve its efficiency and effectiveness and how it can carry out its important role in regulating the safety of nuclear power today and into the future.

Thank you, Mr. Chairman.

Senator INHOFE. Thank you, Mr. Colvin.

Dr. Rhodes?

**STATEMENT OF JAMES T. RHODES, CHAIRMAN AND CEO,
INSTITUTE OF NUCLEAR POWER OPERATIONS**

Mr. RHODES. Thank you, Mr. Chairman.

I am Jim Rhodes, Chairman and CEO of the Institute of Nuclear Power Operations, INPO, headquartered in Atlanta.

For those of you who may not know, INPO is a technical, non-profit organization with all U.S. utilities that operate nuclear plants being a member. INPO was formed in 1979 in the aftermath of the Three Mile Island nuclear accident. Its goal is to promote the highest levels of safety and reliability in operating nuclear power plants—to promote excellence, as we say.

We have four cornerstone programs. First, we do periodic evaluations of all the nuclear power plants in the United States every 12 to 24 months; second, we provide a great deal of training to nuclear plant personnel and accredited training programs that are sites for training nuclear folks; third, we analyze events that occur at various nuclear plants and make sure that the lessons learned from these events are communicated throughout the industry; and finally, we also provide a range of assistance activity to all the nuclear plants in the country.

We do not engage in public, media or legislative activities to promote nuclear power.

Let me say a word about our relationship with the NRC. INPO is independent from but its role is complementary to the NRC. The ultimate goal of both organizations is the same, to protect the health and safety of the public in operating nuclear power plants. However, INPO is different in the sense that we promote the highest standards in the operation of nuclear power plants—beyond the basic regulatory requirements. As I mentioned, we also share information among nuclear power plants to enhance the safety and reliability of the operation of those plants.

INPO grew out of a commission that President Carter appointed in 1979, the so-called Kemeny Commission on the Three Mile accident that said the industry should go beyond regulations in operating nuclear plants.

Let me turn to the performance of the nuclear plants in the United States. This has been alluded to as having greatly improved over the last decade, and I just want to give you some examples.

First of all, we in the industry have ten so-called performance indicators that are objective and performance-based. I have in my written testimony the record of those indicators. It is INPO's annual report. I won't go into detail, but as you can imagine, they cover virtually all areas in the operation and performance of a nuclear plant: such as, what percentage of the time is a plant forced off-line over the period of a year.

I'd like to show you some examples to give you an indication of how the industry performance has improved. If you'll look over to your right, one of the performance indicators is a so-called safety system performance. As you well know, there are many safety systems in a nuclear power plant, redundant systems. This indicator is a measure of the percentage of those systems that meet very high standards of availability, over 97 percent in most cases.

As you can see, over the last 8 years or so, this indicator has gone from about 70 percent to 94 percent and exceeds the goal the industry set some years ago of 85 percent, a goal that we obviously should also achieve in the year 2000 because we're beating it now. This is just one indication of the improvement in performance in the industry.

The second chart is what we call our performance indicator index. This is really a composite of all ten indicators on a relative scale. This particular chart goes back to 1985, some 12 or 13 years ago. This shows on a scale of 100 the composite improvement in the industry of these ten objective indicators. It goes from 43 to 86.

Senator INHOFE. From what year to what year?

Mr. RHODES. 1985 through 1997. It shows a tremendous record of improvement in performance by our overall objective assessment.

The third chart has information which really comes from the Nuclear Regulatory Commission and it gives the significant events which may be personnel errors, loss in some function of safety equipment, or whatever, over the same period, 1985 to 1997. As you can see, there has been a tremendous improvement, in fact an improvement by a factor of 20 between 1985 and 1997.

As I said, this is NRC data. INPO has data that corroborates this very much, so this just gives an indication of how much the industry performance has improved in the nuclear area over the last decade or so.

Let me conclude my remarks by saying the industry, as you well know, does face challenges. We've talked about the need for nuclear power from the standpoint of environmental favorability. Also, I don't think it has been mentioned, but I think the pressures on nuclear power are increasing from an economic standpoint because of the economic deregulation in the electric utility industry that has been going on several years now.

I think it is really incumbent upon all of us involved in the industry to make sure that plants are certainly safe and reliable, but also economic. The three are very compatible. Prior to coming to INPO a few months ago, I was head of Virginia Power for 26 years and about a third of our electricity is generated by nuclear power. I'm proud to say, at least in the decade of the 1990's, Virginia's

power plants operate very safely and also very economically, and they are very compatible factors.

I think all of us, including the NRC, need to focus on the most efficient way to operate and regulate these plants as we go forward.

Senator INHOFE. Thank you, Dr. Rhodes.

Ms. Jones?

STATEMENT OF GARY JONES, ASSOCIATE DIRECTOR, ENERGY, RESOURCES AND SCIENCE ISSUES, RESOURCES, COMMUNITY AND ECONOMIC DEVELOPMENT DIVISION, GENERAL ACCOUNTING OFFICE

Ms. JONES. Thank you for the opportunity to be here this morning, Mr. Chairman, to highlight several points from our report issued last year on aspects of NRC's nuclear regulatory program.

As I think all the members of the subcommittee mentioned this morning, and as our report also points out, the Congress and the public need confidence in NRC's ability to ensure that the nuclear industry performs to high safety standards. While we did not make judgments about the safety of nuclear plants or the appropriateness of NRC's current regulatory structure, the many safety problems identified at plants we examined raised questions about whether NRC's regulatory program was working as it should.

One of the reasons we couldn't make judgments about the safety of plants is that GAO starts its work by looking at the criteria that underpins any program. The difficulty in this situation is that NRC does not precisely define safety. Instead, it presumes that nuclear plants are safe if they operate within their approved design basis and meet NRC's regulations.

The foundation of NRC's confidence that nuclear plants are safe is the redundancy of safety systems or as they call it, defense in-depth. As a result, safety significance is difficult to determine and becomes largely subjective because NRC does not have an effective way to quantify the safety of plants that deviate from their approved designs or violate regulations.

The conditions found at the three plants we reviewed challenged NRC's confidence that plants are operating as designed. It recently completed inspections focused on design basis at 16 other sites and found significant problems, including instances in which licensees had not properly tested safety-related components or documented design modifications related to safety systems.

Let me turn to NRC's inspection program for a moment. One goal of that program is to ensure that deficiencies will be corrected in a timely way. However, we found that the licensees of the three facilities we examined failed to fix substantial and recurring safety problems in a timely manner. NRC allowed these licensees repeated opportunities to correct their safety problems. However, implementation of corrective action plans were never fully completed and although management promised to fix problems but did not always follow through. Also, NRC used enforcement actions too late to effect change.

For example, all but 5 of the 43 deficiencies that NRC required Salem to fix before its reactors can be restarted had been cited as problems before the plant shut down. NRC allowed Cooper to restart its reactors because the licensee promised to fix recurrent

problems, but after restart, NRC found problems that had not been corrected.

The nuclear industry and NRC officials widely agree that the competency of a nuclear plant's management is perhaps the most critical factor in safe performance. NRC cited management weaknesses as a cause for safety problems at the three plants we reviewed and recently found weak management processes and a lack of management involvement as the principal reasons for safety problems found at two plants in Illinois.

Despite the importance of competent management to safe operations, NRC does not assess management as it relates to safety in its plant inspection program. Individual inspection reports specifically avoid any references to management's competency. NRC's references to management weaknesses are usually made retrospectively, often after the licensee admits to management deficiencies and after the window of opportunity to provide an early warning has closed.

Although NRC's watch list targets regulatory emphasis to correcting problems before they lead to shutdown, NRC has been slow to place problem plants on this list. For example, the Salem and Millstone plants were under discussion by NRC for at least three to 4 years before they were placed on the watch list. Further, an Arthur Andersen report identified 10 plants that were not placed on the watch list but whose performance indicators were similar to those that are listed. This inconsistency has been attributed in part to the lack of specific criteria for making decisions on a consistent basis and the subjective nature of the process.

As others have clearly articulated this morning, Mr. Chairman, the world is changing for the nuclear industry. However, that underscores for us the need to ensure that NRC's regulatory program works effectively to protect the health and safety of the public.

The NRC said this morning it is assessing change on a number of fronts, but we believe that NRC's future direction needs to be anchored in goals and objectives that are clearly articulated and performance measures that hold NRC managers as well as licensees accountable. In addition, NRC needs reliable information on which to determine safe operations and enforcement structure that clearly lays out a range of sanctions that will be imposed on the basis of potential seriousness of the safety problems found.

I also wanted to note, Mr. Chairman, that I think our work has been characterized this morning as being maybe counter to what the industry wants. I think the kinds of recommendations that we made to the NRC to clearly lay out the expectations, to hold licensees accountable for what they say they're going to do in the time frames they say they're going to do it, and also to lay out sanctions associated with various levels of safety risk is consistent with what the industry is looking for.

Thank you, Mr. Chairman.

Senator INHOFE. Thank you, Ms. Jones.

We're going to go to the next witness but I want to make sure I wrote this down correctly. I'm still in a little bit of a shock here. Did I understand you to say that the NRC should assess the performance and competency of the licensee's management? Is that correct?

Ms. JONES. Yes, sir. What we're talking about is as the inspectors go out, if they have observations about management, the safety culture.

Senator INHOFE. I'll have some questions about that at the appropriate time.

Mr. Lochbaum?

**STATEMENT OF DAVID LOCHBAUM, NUCLEAR SAFETY
ENGINEER, UNION OF CONCERNED SCIENTISTS**

Mr. LOCHBAUM. I appreciate this opportunity to testify before the subcommittee regarding this important topic.

The industry representatives on this panel are justifiably proud of nuclear power's record over the past decade and indeed they paint a very rosy picture in our view that the industry's healthy performance warrants redirected NRC oversight effort. My objective today is to caution you to watch out for the thorns as you enjoy these roses.

The industry sometimes touts its record in ways that implies it was achieved in spite of the NRC. That is not fair or accurate. The industry's performance over the past 10 years benefited from NRC initiatives such as the maintenance rule and its need for plant-specific risk assessments and also from the NRC's support for industry initiatives such as cost beneficial licensing actions.

The industry cites data such as higher plant capacity factors, fewer plant trips and fewer safety system actuations as evidence of healthy performance. This information is valid but does not provide the complete picture. At this moment, there are nine nuclear plants shut down in the United States protracted shutdowns of many months. These plants are not shut down because the NRC issued them too many uncited and Level 4 violations or because the NRC is dragging its feet on risk-informed regulation. These plants are shutdown because their owners failed to properly discharge their recordkeeping of how, what, when and why information for their emergency equipment which is also known as design control and configuration management.

In the late 1980's, NRC inspections at several plants revealed that their owners had made physical changes to emergency equipment to solve one problem only to create other problems. These errors occurred because these owners had not fully understood or had lost track of the design basis for this emergency equipment.

The NRC proposed a new rule that would have required all plant owners to fully document the design basis for their emergency equipment and to recreate any information that was missing. The industry opposed this rule and convinced the NRC that they could handle the problem internally. So the NRC dropped its plans for the rule.

The industry was wrong. Millstone has clearly demonstrated that some nuclear plants have operated with vital safety systems that would not or may not have functioned had there been an accident. For example, owners of the Big Rock Point plant in Michigan reported just 2 weeks ago that one of its safety systems would not have functioned during the last 13 years of this plant's life.

An NRC team discovered in 1996 that the piping for safety systems at the Head of Neck plant in Connecticut was too small to en-

sure adequate cooling of the reactor core during that plant's entire 28 year operating lifetime. The nine plants shutdown today are fixing design control problems like these.

We should not be operating nuclear power plants unless we know with reasonable certainty that they are safe, their systems needed to protect the public during an accident will work. There have been an alarming number of reports in recent years which clearly show that several plants have operated without fully functional safety systems. These cases are Maine Yankee, the Donald C. Cook plant in Michigan, Beaver Valley in Pennsylvania, Millstone and Big Rock Point. In these cases, the public was protected by luck as much as by defense in depth.

Speaking of being protected by luck, the industry wants to push the NRC more rapidly towards risk-informed regulation. The development of plant-specific risk assessments this past decade has provided valuable insights which promoted many plant owners to voluntarily make physical changes to their facilities that increased their safety margins. Unfortunately, these risk assessments assume that the plants have no design control and configuration management problems. For some plants, this is not a valid assumption. Thus, their risk assessments are inaccurate and nonconservative. Design, control and configuration management problems must be corrected at all nuclear plants before risk-informed regulation can advance.

The industry cites examples of NRC overregulation but there are examples of underregulation as well. Both sets of these examples are probably valid because the NRC regulates subjectively and inconsistently. In a report entitled, "The Good, the Bad and the Ugly," which we issued last month, we documented a wide gap in safety performance in our ten plant focus group. This discernible difference is due to the NRC's subjectivity. We think instead the NRC should develop objective standards which it consistently enforces, particularly when it comes to decisions about whether problem plants should be shut down or allowed to restart. It is a daunting challenge but we think it can be done.

Commissioner McGaffigan pointed out during the July 17 stakeholders meeting that the NRC does a good job on matters in its spotlight. We fully agree with this contention, although we think the NRC needs a larger floodlight. This little penlight job isn't going to allow the NRC to handle the important items on its plate in a timely manner.

The NRC could do a better job if it developed and also used good procedures. Procedures are like the conveyor belt in a factory, they move work products from one station to another until the work is completed. Good procedures are like a strong, wide conveyor belt because they handle most of the work items. Bad procedures are like a thin, unreliable conveyor belt because too many items must be hand carried throughout the process. The NRC needs to have better and to follow better procedures.

I must comment briefly on an industry complaint about the service it gets from the NRC. In recent years, a top NRC priority has been its review and certification of advanced reactor division. To our knowledge, a line of potential buyers for advanced reactors is not forming anywhere in the country. However, there seems to be

a market for these things overseas. We do not oppose efforts to improve U.S. trade, it is simply incomprehensible to us that nuclear safety issues would linger while the certification of advanced reactor design gets fast tracked through the agency.

In closing, I'd like to thank the subcommittee for providing this opportunity to share our views with you.

Thank you very much.

Senator INHOFE. Thank you, Mr. Lochbaum.

Mr. Fetter?

**STATEMENT OF STEVEN M. FETTER, MANAGING DIRECTOR,
GLOBAL POWER GROUP, FITCH IBCA, INC.**

Mr. FETTER. Today I will offer my views based on my membership in the financial community at Fitch IBCA, which is an international rating agency based in New York and London, but also based on my experience as a former State utility regulator as Chairman of the Michigan Public Service Commission.

The Nuclear Regulatory Commission is at the center of investors' perceptions with regard to financial risks facing the nuclear industry. To the extent that the NRC carries out its responsibilities in a consistent and predictable manner, the financial community gains comfort and investors are more willing to put forward their dollars into the future.

I personally find it difficult to envision a competitive market developing around the country without nuclear power playing a significant role. As we heard earlier, it provides about 20 percent of electricity supply currently and with stranded cost reimbursement being provided, almost totally and completely by State regulators, many are counting on the low variable cost of nuclear power to support a competitive industry going forward.

To achieve that goal, the NRC will have to balance their oversight responsibilities versus the necessities that a free market requires. In the past, it's been difficult for investors to predict with any certainty just what factors the NRC would use in rating plants, in modifying SALP ratings, or in putting plants on or off the watch list.

As a former regulator, I can appreciate the pressures that the NRC operates under. It has a statutory scheme that seems aimed at strict adherence as a goal, but when operating such a system with so many standards and requirements, it makes it very difficult for utilities to allocate resources and it also makes it difficult for the financial community to assess risk.

This is very important from the financial community's point of view because the repercussions are so severe. For example, when a plant goes on the watch list, the utility owning that plant usually ends up with a lower stock price, reduced access to equity markets, weakening bond and commercial paper ratings and therefore, a higher cost of debt.

Probably the biggest fear is that once something goes wrong at a nuclear facility, there are so many regulations and standards that the NRC has the ability to find many other violations or potential violations and this could result, and often does result, in prolonged outages.

The situation probably applies to every plant in the country. As one CEO confided to me, and this is someone who praises Chairman Jackson's leadership at the NRC, "Under the current system, every nuclear plant in the country is 10 minutes away from being off line for a year or two." Needless to say, a situation like this creates a great deal of unease among debt and equity investors and inhibits new investment in nuclear as competition comes to the electric sector.

Interestingly, I called a few utilities that have had close interaction with the NRC over the last few years. I asked them for the pros and cons of their experience and they said, thanks but no thanks, they would just as soon keep their heads down for fear that if the NRC or the staff so desired, there are so many regulations, requirements and standards that they could find something wrong at any utility plant, nuclear plant in the country.

What this points to is the crucial nature of the sensitivity the NRC will have to bring to companies, utilities, that will be moving into a competitive environment with nuclear plants. It is incumbent upon the NRC to differentiate between safety items and non-safety items with strict and strong vigilance on safety and more flexibility on nonsafety.

During my time as chairman of the Michigan Public Service Commission, we had great success with performance-based rate-making which provides more discretion to the utilities within limits and it brings mutual benefits to shareholders and ratepayers. The time is right for risk-informed, performance-based regulation at the NRC and I'm encouraged by Chairman Jackson's comments earlier today.

In closing, let me say that the financial community is watching closely the license renewal process and also the potential transfers of licenses from one company to another. If the NRC can deliver on its promise of a fair, effective and efficient license renewal process and shows a similar resolve with regard to the potential transfers of licenses, it points toward continued financial support for nuclear which would ensure a place for nuclear power in the new competitive electricity environment.

Thank you, Mr. Chairman.

Senator INHOFE. Thank you, Mr. Fetter.

Ms. Jones, don't take this personally. One of the other committees that I chair is the Readiness Subcommittee to the Senate Armed Services Committee and we work so closely with the GAO and they've been a real godsend to us in making evaluations, but I just must be missing something here. It's never occurred to me that it could be the function of a regulator to assess the performance and competency of management.

The bureaucracy normally who is in front of this committee is the EPA and I can't imagine Carol Browner assessing the competency of the management of Halliburton or OxyUSA or the FAA assessing the competency of the management of Boeing.

I would just like to ask any of the other four if you believe that it's either appropriate or if they have the necessary skills to do what has been suggested here, and particularly you, Mr. Fetter, where does the market fit into this?

Mr. FETTER. I should say first, as a former regulator, I certainly had opinions on the quality of the management of the utilities within my State. As to my ability to make public assessments and pronouncements, I would be much less comfortable with regard to that.

As far as the market, the markets make assessments on management—.

Senator INHOFE. Yes, the market can. The government, no.

Mr. FETTER. And I would expect that would continue. But I would not think the market would support the NRC coming out with a report card of management on a regular basis.

Senator INHOFE. Anybody else want to respond to that? Mr. Colvin?

Mr. COLVIN. There is an appropriate role for the NRC to look at management and management's ability to safely operate their facilities. That role currently is embodied in the regulations. That is part of their initial review for licensing. The NRC looks at the experience levels of management, the background, and things of that nature. That's part of the licensing decisionmaking process. I think that certainly is appropriate.

The issue you raised, which is the competence of management in their day-to-day decisionmaking, is an inappropriate role for the agency.

Ms. JONES. Mr. Chairman, might I clarify in terms of GAO's position on that issue because when we talk about management competence, we are talking about safety culture as it directly relates to the safety operations of the plant.

I think our report points out that you've got inspectors at those plants on a day-to-day basis and if they have observations to make about decisions that are being made that would directly affect the safety culture, that is just another piece of information that senior NRC management can use to look at the safety of the plant.

Senator INHOFE. All right. Thank you for that clarification.

You heard me during the first panel quote two individuals. Does anyone want to respond to those quotes that I repeated to the first panel or were you listening?

Ms. JONES. We were listening but we didn't write them down.

Senator INHOFE. Let's go back to this July 17 meeting. I'd like to have someone from industry, probably you Mr. Colvin, characterize the nature of that meeting, what was accomplished at that meeting and comments about that meeting you can share with us.

Mr. COLVIN. As a participant of that meeting, I would first say thanks to the Chairman and the Commission and to NRC senior management for establishing that meeting. That was a very positive step, I think an initial step in trying to bring about a reflection and introspection about some of the changes that are necessary. I thought there was an excellent exchange of ideas and concepts at that meeting. I'd like to take that as a step to move forward in our dialogue with the agency.

Senator INHOFE. Was that the first such meeting that followed that format?

Mr. COLVIN. Yes, sir. That's the first such meeting that industry has participated in with the Commission since 1994 where we had

a meeting on industry concerns about the regulatory process with previous commissioners.

Senator INHOFE. Wouldn't you think it would be a good idea to add that to your list of three and make it a list of four when you said 1 year reassessment, oversight hearings and independent evaluation? Maybe this would be a good fourth thing to add to that list.

Mr. COLVIN. Yes, sir, it is an excellent opportunity.

Senator INHOFE. On the independent evaluation recommendation, a lot was said about the Martin Report and those recommendations. Does anyone have any comments to make about the Martin Report?

Mr. COLVIN. My understanding from reading the report is that Mr. Martin looked at the agency with a few basic tools used in organizational reviews. He looked at positions where there was a one-over-one reporting relationship. In most organizational reviews, that shows that one person is unnecessary. Then he looked at where there was duplication across branches of the agency where similar functions were done in different branches or departments.

That review came up with an approximate 700 full time employee equivalents, that could be reduced from the agency without really losing any process efficiencies. As Senator Sessions indicated, the Commission needs to undertake a very introspective look at its staffing levels and processes.

In order to do that, they have to go back to the basics. As I mentioned earlier, we've talked a lot about regulations and risk-informed and performance-based regulation models. In large part, the regulations are only part of the problem; it's the inconsistency of their implementation, it is the fact that I believe the staff does not abide by its own rules and regulations. Third, there are other means that are used to exercise commitments or extract commitments from the licensees—confirmatory action letters, responses to generic letters and bulletins, the SALP process, as well as the watch list, that tend to undermine this relationship and confidence.

Senator INHOFE. I had some other questions that I think probably Senator Sessions is going to follow up on since he brought it up insofar as the comparison. It's always helpful to us since we're not experts and normally people out there are to see how we compare whether it's to other countries, whether it's apples and apples as Chairman Jackson suggested maybe it wasn't in this case. I hope we can get a chance to pursue that.

Senator Sessions?

Senator SESSIONS. I think if you ask the people who populate NRC, they'll say they're not overstaffed, but management has got to challenge the culture, I believe, and find out exactly what the level is that is appropriate for the taxpayer and the industry who has to pay fees which is a form of tax, who should not pay more than they should pay. Certainly, I share that.

Let me ask those of you from the industry is there, in your opinion—first of all, I believe Mr. Fetter mentioned fear. I talked to someone recently and they were just very cautious. They didn't want anything said that they complained. That was clear.

Is there in private conversation a consensus fairly stated that regulations are not effective to accomplish what they want and the

regulators often are unwise in applying the regulations that exist and significant improvement could be accomplished?

Mr. FETTER. I wouldn't use the word unwise. They're going about the task to find anything that might be violating a huge list of regulations. Perhaps, in the old world, a developing nuclear industry had more of a place than in a more competitive world. I think the industry and the regulators have the ability to work together to figure out where their attention would be best focused in the future. For instance, Mr. Lochbaum mentioned a few safety systems that were uncovered that would not have operated properly.

I'm not sure if perhaps there were risk-informed, performance-based regulations, then more of the resources could go toward the more important aspects he points to and less of the resources would be put towards things that are not safety-related.

Senator SESSIONS. Do you agree with that, Mr. Colvin?

Mr. COLVIN. Absolutely, Senator Sessions. We have initiated on the industry's behalf a number of proposed changes over many years. There is a risk-informed, quality assurance program petition for rulemaking that's been under review by the NRC for over 4 years; we have other examples of where we are trying to focus our resources and the NRC's resources on what is really important.

I would like to add one comment to the issue. The issue is, in many ways, an uncertainty in what is required from the regulatory inspector perspective. That causes uncertainty for the licensee, the utilities and uncertainty even for the NRC staff.

That uncertainty then results in some tension and debate that ends up chilling the environment that Mr. Fetter has talked about and giving people concern about raising an issue because ultimately it will come back to you.

I think we also see that chilled environment within the staff. I talk to a number of NRC staff in the field who are unwilling to differ with agency management on what should and what should not be done. That's why I mention we really need to look deeply into the underlying issues that affect the relationship and affect how we regulate these plants. That's where we need to focus our energies.

Senator SESSIONS. Mr. Lochbaum, I appreciate your comments and concerns.

We could probably talk about this for a long time, but just briefly, as a concerned scientist, as you evaluate the utility of nuclear power, do you consider things such as black lung and so forth that is caused by coal mining or air pollution, or the danger of natural gas explosions and losses of life in that fashion? Have you considered that, at least within the United States, all the indications are that it's getting safer and safer. Presumably a newer plant would be even safer than the older plants because we've learned a lot about our designs. Isn't this a direction that the country ought to give serious consideration, that is utilizing nuclear power more rather than ending it?

Mr. LOCHBAUM. In my testimony, I point out that not all indications show that everything is getting safer, just some of the indications show that everything is getting safer, so I guess I wouldn't buy into that.

Senator SESSIONS. Well, we haven't lost any lives in nuclear power.

Mr. LOCHBAUM. That's true but the amount you could lose if there was an accident is such that we need to avoid that rather than prevent the next one.

Senator SESSIONS. We need to be careful.

Mr. LOCHBAUM. The Union of Concerned Scientists issued a study last June in conjunction with five other organizations that looked at this country's energy needs out through the year 2030 in order to meet environmental, economic and policy issues. For the purpose of that study, we considered that the current fleet of operating plants would run to the end of their 40-year lifetime. That assumption has turned out not to be good because some of the owners have chosen to shut the plants down early due to economics, but we assumed they would be there for all 40 years.

We found that you could achieve all of our economic needs, the environmental needs, objectives of the report without any new nuclear power plants. I think we stand behind that report in meeting global warming changes and climate change.

Senator SESSIONS. We're not turning our air conditioning up too much.

Mr. LOCHBAUM. No, and we didn't advocate that either.

Senator SESSIONS. We've got more people and more demand, so it's difficult for me to understand how we won't need more energy. So you're prepared to provide that energy with fossil fuel systems?

Mr. LOCHBAUM. No. It was renewable energy and energy efficiency. I'll be glad to get you a copy of that report.

Senator SESSIONS. It hasn't proven to be a reality yet.

Dr. Rhodes, are you confident that the nuclear power industry is safer today than it was 5 years ago or 10 years ago, the plants that are operating?

Mr. RHODES. Yes, Senator Sessions, I am. I think it's significantly safer than it was a decade or so ago.

Senator SESSIONS. Mr. Fetter and Mr. Colvin, you discussed the possibility of the problem of investors making decisions. Do you foresee investors in the near future making a decision to expand nuclear power? Do you see any immediate prospects of that?

Mr. FETTER. I think the decision facing investors right now is whether to invest in existing plants. That was the discussion earlier—about the long lead time and the license renewal process—whether investors will put up more money now for existing plants.

Senator SESSIONS. To keep them running at the current level?

Mr. FETTER. To keep them running or to have their licenses extended. If a plant is going to go off line 8 years from now and will not be extended, investors will view it differently than if they find out it can go on for another x number of years beyond that.

As far as a new round of nuclear, it would seem to me what investors would want to see prior to that would be greater sensitivity at the NRC. I described that they have to be sensitive to the new challenges of the competitive market that the utilities will face, some standardization or streamlined process for figuring out the right design for the next generation of reactors, and third, but probably most important, as to what you can do, Senator Sessions, would be solving the high level nuclear waste issue. Until that is solved, there can be no serious thought of investment for a new generation.

Senator SESSIONS. So you would say that not only do we have the obvious risk of nuclear materials all over the country stored on-site is not a healthy thing, but you're saying that until we get that solved, there's not going to be any serious evaluation of new nuclear plants?

Mr. FETTER. That would be my view.

Senator SESSIONS. I think that's a challenge for us, Mr. Chairman, because I do not feel that we have done a good enough job in bringing that problem to a conclusion.

Senator INHOFE. Thank you, Senator Sessions.

To show that Senator Lieberman is a man of his word, he said he'd be back and he's back. Senator Lieberman, take all the time you want.

Senator LIEBERMAN. Thanks, Mr. Chairman. I regret that I had a meeting associated with my responsibilities on the Armed Services Committee that I had to attend.

I invite the witnesses to tell me whether I'm asking questions that you've already covered and not force you to go through it again.

I want to start with a question to Ms. Jones and Mr. Lochbaum which is that each of you, in one way or another, has expressed concern that the NRC does not have a clear definition of safety when monitoring safety at nuclear power plants.

We had this come up in our experience in Connecticut and I wanted to ask you both what should the NRC be doing or have they done enough since your criticism to clarify the definition of the basic concept or goal which is the safety of these power plants?

Ms. JONES. Senator Lieberman, I think as the Chairman stated this morning, Chairman Jackson, they are moving in that direction but since our report was issued, they're just really starting to take steps in that direction.

I think what we were looking for was for them to clearly lay out expectations in terms of well-defined boundaries. We understand that it can't be a black and white; there is always going to be some subjective judgment made in terms of nuclear power plant safety but there needs to be better guidance so that the Commissioners, senior NRC managers, as well as the inspectors that are out there on a day-to-day basis, understand how safe is safe and be able to make judgments about that in an informed way.

Senator LIEBERMAN. Mr. Lochbaum?

Mr. LOCHBAUM. I would agree with that position. We think the NRC is sincere and is moving in the right direction, but we think they need to pick up the pace a bit because they are still quite a distance away from being at the point where they have subjective criteria that everybody could look at whether the industry, the public or within the staff itself to determine when a problem plant needs to be shut down for safety reasons or when is it safe enough to restart a problem plant. We think that criteria is lacking right now and it's a very subjective process. I think that is one of the reasons there is some uncertainty or some lack of confidence in the regulatory process.

Senator LIEBERMAN. Is it possible to make it more objective, less subjective?

Mr. LOCHBAUM. If we knew an equation that could do that, we would definitely provide it. We think, as a minimum, you could come up with an empirical database. There have been things that have shut down plants in the past. So, as a minimum, when a new issue comes up, you could say was this equal to what we shut down that plant last year for? If it was, then you'd consider shutting down the plant. We don't even see that standard being applied today.

Senator LIEBERMAN. Do any of the other three on the panel want to comment on that question which is how well or poorly the NRC defines safety, which is what they're supposed to be all about? Mr. Colvin?

Mr. COLVIN. Senator, I'd like to comment on an element of that. We need to move forward in that direction with criteria as objective as possible. I support Mr. Lochbaum's statements in that regard.

We need to move in that direction. In fact, as the Chairman indicated, the industry has proposed an assessment process that includes and overlaps the inspection and enforcement processes in a way that really ties it as directly to safety as we can conceive. I think if we can take out as much of the uncertainty or inconsistency in the application of the assessment process, we will make a significant step forward.

As one example, as pointed out by Mr. Lochbaum in the July 17 meeting, we have one criterion. We allow a plant to continue operating with some known deficiencies because we've evaluated those as not being important enough to safety to shut the plant down, and yet when the plant shuts down for any other reason, those deficiencies become barriers to allowing the plant to restart.

If there are issues which need to be dealt with from a safety perspective, they ought to be dealt with, and we would support that. I think it's that inconsistency and that change that takes place over time that brings about a lot of the uncertainty that we see in this process.

Senator LIEBERMAN. Mr. Fetter, Dr. Rhodes?

Mr. RHODES. I might just comment on the INPO experience over the last 18 or 19 years. I described the evaluations that we do and unfortunately, Senator, we do periodic evaluations of plants every year or two and use these performance indicators.

We have tried over the years to be performance-based, objective, and to minimize subjective evaluations. I think that has helped the industry a great deal. I submit that as a case study in what I think has been a very successful program.

Mr. FETTER. Senator, I should mention that I am not an expert on nuclear engineering or physics, so I'm a good representative from the financial community because there are not many experts on those issues on Wall Street.

Accordingly, to the extent that the NRC and the industry can help define what are the safety issues and what are less important issues, then Wall Street is able to react and not be so concerned. If the NRC brings something to the fore that is not safety related, but needs to be corrected, that would be important for us on Wall Street to know, that would affect our investment decisions.

The way it is now, we do not have a strong sense of the factors that lead to a plant moving onto the watch list—change in ratings,

rating of individual plants—and so we have to rely pretty much after the fact on NRC actions and decisions. Usually when that happens, the reaction of the financial markets is much more severe.

Senator LIEBERMAN. That's an important point. I'm going to come back to that in a minute.

Let me pose my hearing of a conversation related to the industry and ask any of you who want to respond to do so. I've heard some people on the industry side seeming to criticize the NRC for setting a standard for plant operation that is above compliance with the rules. To some extent, we've touched on this in the previous question about the definition of safety.

I think if I hear the industry, or at least these voices, it is that striving for excellence beyond compliance is an appropriate standard but it ought to be set by the industry itself by its own actions and not imposed as it were, even incentivized, by the NRC.

On the other side, I think those that would defend the NRC cite other regulatory agencies which are trying to create incentives, dare I mention EPA, to take regulated entities beyond simple compliance to a higher standard at least with incentives.

My question is, am I hearing this dialogue correctly but if I am, what is your reaction to it? What is the appropriate role for the NRC in setting a standard for nuclear power plant operation that may be above compliance with the specifics of law or regulation?

Mr. Colvin?

Mr. COLVIN. Senator Lieberman, I think the issue is if you look at the statutory underpinnings of the agency and the Atomic Energy Act, they have the statutory mandate to issue regulations necessary for the adequate protection of public health and safety. Those regulations are not the minimum levels necessary. There is margin, both in design and operating parameters, built in.

The NRC then issues regulations that it has have determined are a benefit to safety that is worth the cost of implementation and other sections of those regulations. So we have a mix of regulatory requirements that, in fact, have established a threshold level that has some margin in it, another set of regulations where there is an increased benefit above that level, and then we have the NRC's inspection activities and the utility's own management and other oversight activities from INPO and other inspection activities that provide an additional basis.

The real question comes down to how does the NRC know what is required of the licensee if in fact you are continually striving to do better and how does the licensee know what is expected of it by the regulatory agency.

So you're into an area where the individual inspectors or the individual operators are changing what the expectations are on a continuing basis. In a regulatory system, that does not work. It does work in the INPO model when the industry is setting standards and learning as we go on how to improve, because it's done by the utilities themselves.

Senator LIEBERMAN. Mr. Lochbaum, do you have a response?

Mr. LOCHBAUM. I guess the way we view that question is it gets back to the objective criteria. The NRC would come in and evaluate

a plant and if it feels that is a good performing plant, all the findings will be discounted or there would be no findings.

If that utility gets into regulatory distress for whatever reason, all of a sudden those findings which were discounted or not written up before are now given a violation stage or civil penalty stage.

Performance doesn't change like that overnight. The NRC's perception does. The NRC needs to have objective criteria to understand what plant performance is. They don't have that and that puts them into this box where a good performing plant overnight comes on the watch list or is headed for the watch list. That is not fair to anybody involved.

Senator LIEBERMAN. That leads me to my final question—I appreciate your courtesy, Mr. Chairman, with the time—and that is on the watch list process which you referred to, Mr. Fetter.

We all go about our lives and are not focused; we turn on the switches and a light comes on; and we are not focused on nuclear power plants in our respective States or jurisdictions. We were stunned when the actions were taken against the plants in Connecticut. We had high confidence in the management and it was a big surprise. To a certain extent, we had a little bit of a covert early warning system going through some of the whistleblowers, but still there was widespread surprise.

My question is about the watch list process. If you've talked about this at length, don't talk about it at length again, but the question is, is there something we should do, that the NRC should do to provide an early warning system regarding problem plants before they get on the watch list? Ms. Jones?

Ms. JONES. Senator Lieberman, I think the watch list was intended to be used to help plants not to become problems.

Senator LIEBERMAN. To be the early warning.

Ms. JONES. And I think the point is that the NRC is really taking too long to get plants on. They wait until a significant event to put them on the watch list, whereas if they had put them on earlier and maybe watched them, they wouldn't have gotten to that significant event.

Senator LIEBERMAN. Which might mean that there would be more plants on the watch list at any given time but it would have less—I don't want to say urgency but it would be for reasons that are less dire as it were.

Mr. Fetter?

Mr. FETTER. I think the fact that it's unpredictable from the point of view of the financial community leads us to treat every plant like it might be on the watch list tomorrow. That uncertainty does not help the industry and does not help the ultimate consumer.

Senator LIEBERMAN. Thanks to all of you and Mr. Chairman, thank you.

Senator INHOFE. Thank you, Senator Lieberman.

Let me make a couple of observations and ask a couple of questions.

One is safety is very important and we all understand that, but I think almost equally important is the perception of safety and I think we've come a long ways. When the percentage was used—I believe there was one member in the first panel, I'm not sure who

used it—it was 70 percent of the public approved of nuclear power. Is this a figure you've heard before? Is this a good figure?

Mr. COLVIN. The industry runs the public opinion polls routinely and over the years, certainly since the mid-1980's, somewhere between 65 to 75 percent of the public supports both current nuclear energy in the United States and future building of new plants as well as extending the licenses of these plants.

The most recent study identified a fact that we also have seen in our same reviews from the congressional staff perspective and that is there is a significant perception gap in what an individual thinks and what they believe their neighbors think. So while I might say I support nuclear energy and I'm part of that 70 percent, my good neighbor, Dr. Rhodes, I might think he would not support it and we identified two basic reasons. One is that it is somewhat controversial and the individuals have little substantive information on which to base any dialogue or debate. So we have to narrow this gap in perception.

As you pointed out, Senator Sessions, when you go to the local communities that have been and around these plants and the people work in those areas, even in your State, Senator, these people believe very strongly in that support and they are confident in the safety. Sometimes that is undermined, then that confidence gets rebuilt but as a matter of national policy, about 70 percent has been the number over the last 10–15 years.

Senator INHOFE. Do you think the heightened visibility of other forces of energy and power and the problems associated with them such as having gone through the particulate matter, the ozone and all of this might be contributing to the public acceptance of nuclear power?

Mr. COLVIN. I think there is an important relationship there that is being brought about the debate, the dialogue on the Kyoto protocol and other issues. I guess there are two factors that bring that about. One is certainly the environment, the realization that we have to protect the environment and what are the real means available to us to do that. The second issue is the drive towards competition because in the policy arena that drive is forcing a realistic debate and in many ways, an unemotional debate, on the technologies that exist to meet energy demand today and do it in an economic way.

Nuclear power is the second cheapest source of electricity in the United States on a marginal cost basis on average. It's slightly above coal and it's about half of natural gas. We have some factors like investment and other issues which are being dealt with.

To answer your question, Mr. Chairman, we have this debate that we're having on both competition and it's connection to the environment which are really bringing about a new way of thinking. I think that is being felt across the Nation by the public because of their desire to look at the environment for now and for the future.

Senator INHOFE. I would like, Dr. Rhodes, to have gone into some of the ten indicators that you have and perhaps we can get educated after this meeting on that. I'm very pleased with the results you have and I want to see how you developed those results.

Were all of you pretty pleased with the assessment in terms of 30 to 36 months in terms of the relicensing process that Chairman Jackson shared with us?

Mr. COLVIN. That's a good start, sir. We hope that with learning from the successes and obstacles in the first two license renewal applications, the agency will be able to improve that process significantly. I know that certainly is the desire of the Chairman and the Commission.

Senator INHOFE. I would just say that that's one of the reasons we will be having another oversight hearing and we will take into consideration your concern for a shorter period of time in terms of reauthorization. I think you probably know it's been the history of this committee to use the 5-year period. This might be an exception to that. We will be visiting with members of the committee as well as the Chairman.

We will complete our hearing with questions by Senator Sessions.

Senator SESSIONS. I'll just make a comment and see if anyone else would express their thoughts on it.

One issue we haven't talked about, Mr. Chairman, is the vacancies on the Commission. We have I believe two now. There has been a renomination of Ms. Dokas. I've had an opportunity to meet with her and I enjoyed that conversation.

I also know that there is another position that is considered a Republican-appointed position. A name has been submitted to the President for over a year and he has not acted on that. I think we need to deal with that.

We need a full Commission. I think it would not hurt the Commission to have another two Republican members of it. It might be helpful to it. I think it's a pretty serious issue and I think we ought to be pretty strong about this. We expect the President to cooperate and we'll try to cooperate and improve this agency. I just wonder would anyone else like to comment about that subject?

Mr. COLVIN. Here, here.

Senator SESSIONS. I would yield back my time, Mr. Chairman.

I would just say this. I think Chairman Jackson has recognized some of the problems and we need to encourage and support her in her efforts.

Senator INHOFE. Senator Sessions, I would say that privately Chairman Jackson has expressed a concern for filling those slots too. I think we'll try to use this committee to encourage that to be done.

Again, on the 28th of January, all of you who are participating today, I think it would be appropriate to have you on that list so you might be planning in advance.

We appreciate very much the time you've given from both panelists.

We are adjourned.

[Whereupon, at 11:47 a.m., the subcommittee was adjourned, to reconvene at the call of the Chair.]

[Additional statements submitted for the record follow:]

STATEMENT OF HON. JOSEPH R. BIDEN, JR., U.S. SENATOR FROM THE STATE OF
DELAWARE

Mr. Chairman, thank you for providing me the opportunity to testify before your committee today.

The NRC and its oversight responsibility of nuclear power plants has been a top concern of mine for the last 20 years. As you know, that's why I requested that this committee hold an oversight hearing to further investigate the NRC's safety enforcement record.

The NRC's lax safety record was detailed in a 1997 GAO report that I—along with Senator Lieberman—requested, which concluded that there was an attitude within the NRC, a “culture of tolerating problems,” that allowed nuclear plants to deteriorate, year after year.

Frankly, my concerns about the NRC originated back in the mid-1970's with the Salem Nuclear Generating Facility, which is located practically in my State's backyard—just across the Delaware River. Repeated serious incidents over years and years were met with what appeared to be reluctance on the part of the NRC to take the type of tough action needed to ensure the protection of the public health and safety.

Just a couple of examples: In 1983, an automatic safety system, designed to stop nuclear reactions when the plant's computer determines the reactor is approaching danger, failed twice in 4 days. NRC seemed unwilling to require improvements in the plant and allowed for a restart with no assurances that the plant was safe. In November 1991, a devastating accident shut down operations for months, after three control valves failed, allowing the main turbine and generator to spin to its destruction.

Just a year later, a computer glitch in the control room knocked out dozens of warning lights and alarms, freezing indicator panels for more than an hour and a half, without anyone noticing that something was wrong. And in 1994, operators lost partial control of the reactor pressure and temperature for more than 5 hours. Yet, despite this checkered past, NRC repeatedly avoided taking aggressive action. Let me briefly discuss the findings of the 1997 GAO report. The report investigated NRC's oversight and safety conditions at three nuclear generating facilities: the Salem Generating Station in Salem, New Jersey; the Millstone Nuclear Power Station near New London, Connecticut; and the Cooper Nuclear Station near Brownville, Nebraska.

Among the GAO's findings:

- The NRC failed to take aggressive enforcement action on safety requirements.
- When violations were uncovered, NRC often relied on the plants' promises to make changes—yet rarely followed up to ensure that corrective measures were taken.
- NRC's lack of aggressive action when problems were first reported made unsafe conditions at the plants worse. For example: GAO found that of the 43 deficiencies that must be addressed before the Salem reactors could be restarted, all but 5 existed when the reactor was operating. When the NRC did act, it was often too late.
- Finally, competent plant management, which everyone agrees is key to safe operations, was not even assessed directly in NRC inspections and reports.

So what can be done to rebuild the public's trust in the NRC and make sure that these plants are operated safely? This congressional hearing is one step to further explore NRC's shortcomings and what the Commission can do immediately to further address these failings.

I would urge my colleagues to keep the heat on the NRC; to demand a top-to-bottom review of its inspection processes and insist that this agency do a much better job of seeing to it that problems are detected and dealt with in a timely manner.

Finally, the NRC must assess the competency and performance of plant management. While we want to encourage more effective industry self-policing, we need more than that if we are going to be confident of the public's safety. We need to have the mechanisms in place to make sure that we never have a lax management team running any nuclear plant.

Now, to be fair, the NRC has taken some positive steps over the past year to address these problems. I also think the new management at the Salem Nuclear Power plants has made significant progress since it voluntarily shut down both units in 1995. Deficiencies at both Salem I and Salem II have been corrected and the units are operational once again. Nonetheless, I would hope the NRC would welcome this opportunity to restore the public's faith, and prove to us that we can rely on this regulatory agency to do its job of protecting the public health and safety.

Again, I want thank the chairman and committee for holding this hearing. I sincerely hope that it leads to a more effective NRC that places a greater importance on the safe operations at nuclear power plants.

STATEMENT OF HON. CHRISTOPHER J. DODD, U.S. SENATOR FROM THE STATE OF CONNECTICUT

I would like to thank Subcommittee Chairman Inhofe and Senator Graham for scheduling today's hearing on the Nuclear Regulatory Commission (NRC). Last year, I joined with Senator Lieberman in requesting a hearing to review management and oversight practices at the NRC, with specific regard to its regulation of Connecticut facilities. I look forward to hearing from the NRC and the General Accounting Office (GAO).

I have been a long-time supporter of nuclear energy. A safe, reliable source of power is critically important to the well being of my state. Unfortunately, through first-hand experience, I have learned what happens when the public loses confidence in the practices of the nuclear industry and the agency tasked to regulate that industry.

For many years, the nuclear industry in Connecticut was plagued by mismanagement and lax oversight, culminating with our four nuclear facilities being placed on the NRC Watch List. The four facilities were shut down and require NRC approval before being allowed to restart. In July, the newest and largest of the facilities was allowed to restart. Two of the older facilities have been permanently shut down and will be decommissioned, and the remaining facility is preparing for restart.

During this troubling time in Connecticut, both the nuclear industry and the NRC came under attack. The NRC levied millions of dollars in fines on the Connecticut facilities and others throughout the country, for a variety of safety and technical violations. In addition, in 1997, the GAO issued a report stating that the NRC was not aggressive enough in their enforcement action and allowed deficiencies to go uncorrected for too long a time, at the total discretion of the individual licensee.

As a result of the GAO report recommendations and the experiences in Connecticut, the NRC, under the direction of Dr. Jackson, has undertaken new initiatives to address oversight problems and be more responsive to concerns raised by whistle blowers. It is imperative that the NRC make internal changes to adequately regulate the operating facilities and those that are being decommissioned. Continued vigilance is imperative.

In specifically dealing with the situation in Connecticut, I want to thank Dr. Jackson for coming to Connecticut at my and Senator Lieberman's request. In an unprecedented practice, the NRC held public hearings in Connecticut, providing a forum for concerned citizens to directly interact with agency representatives to discuss the situation.

In response to the situation in Connecticut, I introduced S. 960, the Distressed Communities Support Act. This legislation would allow half of all fines levied by the NRC to be funneled back to communities impacted by plant problems or decommissioning. When a plant is poorly operated or inadequately regulated, towns and cities are left with exorbitant safety and economic concerns. This bill would help towns develop health, safety, environmental and economic programs. I would appreciate the committee's and the NRC's comments.

STATEMENT OF SHIRLEY ANN JACKSON, CHAIRMAN, NUCLEAR REGULATORY COMMISSION

Mr. Chairman and members of the Subcommittee, the Commission is pleased to appear before you to discuss nuclear safety regulatory issues and the programs of the Nuclear Regulatory Commission (NRC). I would like to begin by providing the Committee with a brief summary of topics that are of particular interest.

In the broadest sense, the mission of the NRC in fiscal year 1999 remains the same as when the Congress created the NRC with the Energy Reorganization Act of 1974: that is, to ensure the protection of public health and safety, the common defense and security, and the environment in the civilian use of source, byproduct, and special nuclear materials. Periodically, however, the NRC has engaged in self-examination and reassessment of its regulatory functions—both as a stimulus for continued improvement and in response to changes in the industries we regulate. The 3-years since the initiation of the NRC Strategic Assessment and Rebaselining effort in 1995 have been a time of self-evaluation, as we have prepared to realign our regulatory policies and programs in order to improve our own effectiveness and

efficiency, as well as to position the agency for changes in the regulated environment, such as those resulting from electric utility deregulation and restructuring.

In recent months, the NRC has been the subject of a number of external reviews, some of them sharply critical, from our Congressional appropriations committees, the General Accounting Office (GAO), the NRC Inspector General, the nuclear industry, and other stakeholders. Whether or not one agrees with these criticisms, we believe that they are worthy of careful consideration. They provide a useful opportunity to review the improvements we already have put into place; to examine the initiatives we have started and to evaluate the need for accelerating or adjusting the emphasis of those initiatives; and to address new issues where they have been identified. In addition, given the public manner in which the NRC conducts its affairs, we believe these critiques have provided a useful impetus for engaging in active dialogue with our stakeholders. Earlier this month, in fact, the Commission invited a number of these stakeholders, including some of our harshest critics, to engage in a round-table discussion, open to the NRC staff, the press, and the public. As anticipated, this meeting provided the Commission with beneficial insights, including a range of perspectives on the strengths and the weaknesses of NRC regulatory programs and policies.

We believe this Commission has been willing to tackle difficult technical and policy issues—many of which have become multi-dimensional and complex through a history of providing short-term or incomplete resolution. While this willingness to take on challenges may have uncovered or highlighted areas in need of change, we believe we also have pursued a solutions-oriented focus toward accomplishing those changes in a comprehensive and enduring manner.

Regarding the criticisms leveled recently, it is important to note that they have not been all from one direction. Certain critiques have been perceived to be driven by pressure from the nuclear power industry, with implied or overt accusations that nuclear energy has become economically burdened as the result of NRC over-regulation. On the other hand, the General Accounting Office (GAO), the Union of Concerned Scientists, and other groups have been vocal in criticizing the NRC for a lack of rigor in demanding strict adherence to clear safety standards. These organizations are demanding even stronger NRC regulatory oversight of its power reactor licensees.

We would submit that, as an independent regulatory agency, the NRC must be careful to maintain a focus on meeting its legislatively established health and safety mission. While we must be fair in considering the views of all our stakeholders, and while we must endeavor to accomplish our mission as effectively and efficiently as possible, we cannot afford to be propelled back and forth by every current in the river. Given our health and safety mandate, and given the nature of the industries we regulate, we believe there is virtue in being deliberate—not sluggish, but careful and thoughtful—in analyzing, optimizing, and accomplishing the necessary changes to our processes.

While this testimony is provided as input to an oversight hearing, it also is structured to provide, clearly and directly, the NRC analysis of and response to the critiques I have mentioned. A more complete discussion of the full spectrum of NRC programs is provided as background information in an appendix to this testimony. I will focus on the specific areas that have been criticized.

In May 1997, the GAO issued a report entitled “Nuclear Regulation—Preventing Problem Plants Requires More Effective NRC Action.” Criticisms in the GAO report focused on the perceived lack of early NRC intervention and enforcement action to prevent declines in nuclear plant performance. The GAO recommended an increased NRC focus on licensee responsiveness to identified problems, with specific strategies for NRC action when licensees allow problems to go uncorrected, and an increased NRC focus on licensee management competence as a component of NRC inspection and assessment.

We believe that changes we have initiated to our reactor inspection and performance assessment processes will address most of the GAO concerns. These changes include: (1) efforts to develop and rely on more objective performance indicators; (2) the integrated review of our reactor assessment processes (known as IRAP), which I will address in more detail shortly; (3) an increased emphasis on the FSAR as a current reference document; and (4) a review of NRC practices in following up on licensee commitments. In addition, the NRC will increase its focus on performance-based (i.e., outcomes-oriented) inspections as the basis for drawing conclusions related to licensee management processes and controls.

In a separate report, issued in March 1997, the GAO focused on the NRC system for handling the safety concerns, or allegations, raised by licensee employees. The GAO observations and recommendations covered a wide spectrum, generally centered around: (1) the timeliness of the Department of Labor (DOL) process for ad-

addressing discrimination complaints filed under Section 211 of the Energy Reorganization Act of 1974; (2) NRC capabilities for monitoring the allegation process; and (3) NRC knowledge of the work environment at nuclear power plants.

The NRC has taken aggressive action to improve its overall allegation program through increased management emphasis on the treatment of allegations and the protection of alleged identity, more effective and efficient allegation-related processes, improved timeliness and quality in communications with alleged, upgraded NRC employee training, a new software system for tracking and trending allegations, and specific process changes to incorporate allegation-related insights into the evaluation of licensee performance in NRC Senior Management Meetings. We have taken specific measures to eliminate a vulnerability related to protecting alleged identity in the release of documents under our Freedom of Information Act (FOIA) processes. In addition, in our interactions with the Department of Labor, we have undertaken a number of measures that will enhance the joint agency treatment of Section 211 complaints.

In June 1998, the NRC received a number of critiques, including reports from both the House and Senate Committees on Appropriations, that covered a broad range of NRC programs perceived to be in need of improvement. For treatment in this testimony, we have grouped these criticisms into the following categories: (1) risk-informed and performance-based regulation; (2) reactor inspection and enforcement; (3) reactor licensee performance assessment; (4) reactor licensing and oversight; (5) uranium recovery; and (6) NRC organization and management effectiveness and efficiency.

A major area of criticism focused on NRC processes that result in expending undue NRC and licensee resources to address NRC requirements that are of relatively low safety significance. NRC critics, in general, believe that the NRC needs to accelerate its move toward making the entire NRC regulatory framework more risk-informed (i.e., such that areas of highest risk receive the greatest focus), and more performance-based (i.e., more results-oriented, and more open to allowing licensee flexibility in how to meet NRC regulatory requirements).

The Commission has been very supportive of this adjustment in regulatory approach, as a means toward enhanced decision-making, improved efficiency, and reduced licensee burden in both the reactor and materials arenas. We agree, however, that the pace of current actions should be accelerated, and we are open to working with our stakeholders toward that end. Long-term NRC initiatives such as the Cost Beneficial Licensing Action program and Improved Standard Technical Specifications were designed to concentrate NRC and licensee resources on more safety significant aspects of nuclear power plant operation, and to remove or modify requirements with little safety benefit and high cost. Under the Probabilistic Risk Assessment (PRA) Implementation Plan, the NRC more recently published generic regulatory guidance to support risk-informed plant changes, as well as application-specific guidance in the areas of technical specifications, in-service testing, in-service inspection of piping, and graded quality assurance. The Commission also has emphasized an approach to rulemaking that is risk-informed and, where appropriate, performance-based, in order to reduce the burden associated with overly conservative or prescriptive requirements and to sharpen the focus on matters of highest risk. As one example, in September 1995 the Commission approved the issuance of a revision to 10 CFR Part 50, Appendix J, "Primary Reactor Containment Leakage Testing for Water-Cooled Power Reactors." The revision added an option entitled "Performance-Based Requirements," to allow licensees to replace voluntarily the prescriptive testing requirements of Appendix J with testing requirements, based both on overall performance and on the performance of individual components. Another example is the NRC Maintenance Rule—made effective in July 1996 and now being revised—which uses a risk-informed and performance-based approach to ensure the availability and reliability of key structures, systems, and components in power reactor facilities. Through training, program reviews, and stakeholder interactions, the NRC also is working to make its inspection, enforcement, and assessment processes more risk-informed and, where appropriate, performance-based, in order to provide a coherent, defensible, and consistent framework for the entire spectrum of NRC regulatory functions.

In the area of reactor inspection, the NRC has been criticized for failing to reduce the inspection-related licensee burden in a manner commensurate with overall industry improvements in safety and efficiency. Similarly, regarding NRC enforcement practices, critics have stated, among other contentions: (1) that the recent increase in non-escalated enforcement reflects a change in NRC culture rather than a decline in licensee performance; (2) that the cost of responding to violations of low severity is excessive; (3) that enforcement is not properly focused on safety and matters of high risk; and (4) that the NRC needs to abandon its reliance on an approach that

demands strict compliance with its regulations, without regard to the relative safety significance of individual issues.

While the NRC believes that the basic focus and emphases of its inspection and enforcement programs are sound, we agree that improvements are needed in both areas. The average number of inspection hours has, in fact, decreased, and the gradient has increased between the amount of inspection received by the best performing plants and plants experiencing performance problems. While short-term efforts are focused on increasing the incorporation of risk information into inspection planning and execution, we also plan to initiate, in October 1998, a review of the inspection program structure, focus, and procedures. The decision to perform this review was a result of initiatives which occurred over the past year that were aimed at achieving regulatory excellence. These include the ongoing review of our reactor performance assessment process, our improvements to the Senior Management Meeting process, and our performance of a job task analysis for personnel involved in our reactor inspection program.

Regarding the criticisms of our enforcement practices, we believe that the increase in non-escalated enforcement actions stems from an concerted effort to improve consistency, together with an increased focus on compliance, and a specific emphasis on ensuring that reactor plant design bases have been maintained. The NRC does not believe that this increase in violations reflects a decline in reactor safety performance. In fact, as part of the efforts described above, we may have inadvertently created too low a threshold for Severity Level IV violations, as compared to minor violations. The NRC recognizes the resource demands associated with relatively low-level violations, and we have taken several short-term actions to simplify the disposition of these non-compliances. We have increased the level of centralized oversight to ensure consistency in this area, and we have increased the headquarters oversight and coordination of the appeal process for disputing low-level violations. As directed by the Commission, the NRC staff has changed one of the criteria for distinguishing minor violations from Severity Level IV violations. As an overall effort to improve our enforcement practices, we also intend: (1) to continue to meet with stakeholders to consider the need for further change, including identifying unnecessary or duplicative regulations or requirements and removing the burden of responding to low severity level violations; (2) to improve guidance on factoring risk into enforcement decisions; (3) to use training, internal audits, and stronger management oversight to identify and correct inconsistencies and other problems; and (4) to provide closer coordination between inspection and enforcement activities.

In the area of reactor performance assessment, the strongest overall criticism has centered around the subjectivity and lack of scrutability of our assessment processes. In particular, critics have faulted these processes for the lack of clear, objective assessment criteria—including criteria used to place nuclear power plants on the NRC "Watch List." Taken as a whole, these processes have been characterized as being redundant and too resource-intensive, both for licensees and for the NRC.

The NRC agrees with the thrust of these criticisms. However, we would note that these flaws have been the focus of considerable Commission attention, and that specific agency initiatives are underway to address these very concerns. In 1996, the Commission directed a study of the Senior Management Meeting (SMM) process by Arthur Andersen, which resulted in an increased emphasis on objective, quantitative information, as well as a number of SMM process improvements. From that study, the increased scrutiny of the overall assessment function led to initiating the IRAP—a full-scope, integrated review encompassing all NRC reactor-related performance assessment processes—with the goal of developing a single, integrated process that is more objective, more scrutable, and less resource intensive than the current mix of processes. We expect to complete the IRAP by late this year. In the interim, the Commission has initiated several other changes, which include: (1) changing the frequency of the SMM from semiannual to annual; (2) requiring a more systematic processing and comparison of regulatory performance data in the areas of human performance, enforcement, allegations, and risk; (3) providing a structured analysis of performance data in a publicly released plant issues matrix for each plant; and (4) providing for Commission approval of actions taken at the Senior Management Meeting.

In the area of reactor licensing and oversight, the primary criticisms have been: (1) that the NRC has implemented informal processes that bypass formal procedures, thereby imposing requirements inappropriately; (2) that the NRC has reinterpreted improperly what constitutes design basis information, in a manner that is unclear, unduly burdensome, and unproductive; and (3) that NRC adjudicatory processes take too long and cost too much.

Once again, the NRC agrees with the general thrust of these issues, and we are taking action to address the concerns expressed. Regarding regulatory process con-

trols, we have adopted measures that internally challenge the need for each generic communication, to ensure that the licensee actions requested and responses required are commensurate with the safety significance of the issues involved. In addition, we will increase NRC management oversight of the issuance of Confirmatory Action Letters, to ensure that proper controls are exercised in NRC staff confirmation and documentation of licensee commitments, and that licensees are not pressured into actions in excess of regulatory requirements. Regarding our focus on design basis information, the Commission has issued revised guidance to clarify the evaluation process for resolving degraded and nonconforming conditions, and we are committed to providing more flexibility for our licensees to make facility changes without NRC approval (i.e., using 10 CFR 50.59). We will continue to work with the industry to bring clarity and a risk-informed approach to this area. Finally, regarding adjudicatory processes, the Commission has been working to implement several measures, including: (1) streamlining the hearing process, (2) clearly delineating Commission expectations for adjudicatory proceedings, such as schedules and sua sponte reviews; and (3) making provisions for Commission guidance to licensing boards on individual proceedings, timely identification of any open generic policy issues for Commission decision, and effective integration of the technical review and adjudicatory schedules. While these measures are designed to improve the timeliness of all NRC adjudicatory proceedings, we have given particular consideration to ensuring that the process for reactor license renewal will be efficient, fair to all parties involved, and focused on the technical merits of the applications. We also will examine whether changes (including legislation) would be appropriate to expand our use of more informal or legislative-style hearings in licensing proceedings.

Several criticisms have related to the overall topic of NRC organization, management effectiveness, and efficiency. Critics have called for an agency-wide review, contending that the NRC has been unresponsive to previous internal and external reviews, and faulting the agency for an overall lack of self-assessment capability. Significant NRC staffing and resource reductions have been suggested, targeting the areas of management and support, human resources, finance, professional staff (particularly in the area of reactor oversight), research, and international programs.

Perhaps the most compelling NRC response to these concerns is the extensive effort we have made, in recent years, to construct a coherent, defensible, and dynamic framework for strategic planning and resource management. In 1995, the Commission initiated the Strategic Assessment and Rebaselining review, which compared agency programs to Congressionally mandated NRC authorities and responsibilities, and provided the foundation for developing our fiscal year 1997–2002 Strategic Plan, the fiscal year 1999 Performance Plan, and program-level, outcomes-focused operating plans. We are developing and implementing an integrated, coherent, agency-wide process for planning, budgeting, and performance management, which builds in accountability and self-assessment, and provides a direct means to refocus work or re-deploy resources in response to change.

Moreover, as this Committee is aware, the NRC is already much smaller than it once was. The NRC's fiscal year 1998 budget, when adjusted for inflation, is the lowest in the 23-year history of the NRC. As an example, the current NRC research budget has been reduced by approximately 80 percent over the past 17 years. Since fiscal year 1994, the NRC has reduced Senior Executive Service managerial positions by 16 percent, from 220 to 185. We have improved the overall supervisor-to-employee ratio, and we are striving to reach our goal of 1:8 by the end of the next fiscal year.

We believe, further, that the NRC has been vigorous in its self-assessment, using both broad-scope and specifically focused reviews to uncover deficiencies and develop sensible solutions. Some of these reviews, such as the IRAP, have been internal, while others have employed external consultants, such as our recently initiated enlistment of Arthur Andersen and Company to evaluate our planning and self-assessment processes, beginning with the Office of Nuclear Reactor Regulation (NRR). In addition, we have made a concerted effort to be open and receptive to criticism, including the broad array of critiques outlined in this testimony. We actively seek interactions with our stakeholders to engender feedback and input on our performance in various regulatory functions, and to solicit suggestions for continued improvement.

Regarding the specific areas mentioned for staffing reductions, we will continue to seek areas in which greater organizational efficiency can be achieved. We expect that the enhancements resulting from our reactor oversight process reviews will allow a reduction in resources in some areas, while retaining the necessary level of expertise and a defensible level of oversight. We have made considerable progress in reducing our management and support staff, and we will continue to target reductions in these areas. Finally, we believe that our participation in international

activities is beneficial to the regulation of U.S. nuclear power plants, and not only augments our operational experience database, but, in fact, also plays an important role in leveraging our limited resources by allowing cooperative research.

We would like to thank the members of this Committee for the support they consistently provide to the Nuclear Regulatory Commission. As I have heard said, "a bend in the road is not the end of the road, unless you fail to make the turn." I believe I can say, with my Commission colleagues, that we intend to make the turn, if, in fact, we are facing a bend—or to modulate our trajectory, if that is the degree of adjustment needed.

To proceed with modifying the agency regulatory approach along the lines I have discussed requires that we have adequate resources. As you know, both the House and Senate have passed Energy and Water appropriations bills for fiscal year 1999. The Senate would appropriate \$470.8 million for the NRC, including the NRC Inspector General, and the House version would appropriate \$467.5 million. Either bill would constitute a sizeable reduction from the requested level of \$488.6 million. As requested, that level did little more than to enable the agency to maintain its resources in the face of inflation. The present reduction, if carried out, will require the NRC to reduce its planned fiscal year 1999 programs by at least \$17.8 million. As a result, the NRC will cut back on its reactor inspection and reactor oversight programs, curtail selected safety research, eliminate studies of nuclear materials operating experience, and substantially reduce many of its support activities.

With the Senate and House appropriations bills as a catalyst, our fiscal year 2000 budget proposal will reflect an approach that accelerates many of our efforts leading to a revised regulatory framework. We believe that accelerating our efforts toward a risk-informed and, where appropriate, performance-based regulatory approach will both enhance our safety decisions and provide a coherent basis for our regulatory processes. Through the full implementation of our Planning, Budgeting and Performance Management Process, our fiscal year 2000 program resource requirements will reflect additional efficiencies and more streamlined processes. Some of that streamlining already has begun, and is reflected in the current fiscal year 1999 budget estimate. As I have outlined earlier, we are committed to examining broad aspects of our reactor inspection, enforcement, and performance assessment processes (as well as other programs), and we will make the adjustments needed to optimize our performance in those areas. Where criticisms are found to be valid, our decisions to make additional adjustments—or to accelerate changes already in progress—may require further changes to the fiscal year 2000 program and the associated budgetary resources.

As you know, the Omnibus Budget Reconciliation Act of 1990, as amended, requires the NRC to recover 100 percent of its new budget authority, less the amount appropriated from the Nuclear Waste Fund for high level waste activities, by assessing fees. However, the NRC 100 percent fee recovery requirement reverts to 33 percent at the end of fiscal year 1998, if the current requirement is not extended. The Committee on Environment and Public Works has approved unanimously S. 2090, "NRC Fairness in Funding Act of 1998," which would extend the authority of the NRC to collect fees through 2003. Both the House and Senate appropriations bills for fiscal year 1999 contain general provisions extending approximately 100 percent fee recovery for fiscal year 1999 only. The Commission encourages the Congress to act on the fee authority extension in S. 2090 so as to provide a sound future funding base for NRC programs.

The Commission, NRC licensees, and the Congress have expressed concerns regarding the fairness and equity of charging licensees for certain agency expenses that cannot be attributed to individual licensees or classes of licensees. The Commission recently has considered issues associated with fees, and has concluded that reducing the fee-based portion of our budget would address these fairness and equity issues. Thus the Commission supports removing a portion of NRC funding from the fee base, and covering it with separate appropriations, as provided for in S. 2090.

In conclusion, the Commission is committed to making the changes necessary to maximize NRC regulatory effectiveness, and we are sensitive to the need to contain the costs of doing business in order to minimize the financial impact to our licensees. At the same time, we take very seriously our responsibility to provide reasonable assurance of adequate protection of public health and safety in the use of nuclear materials in the United States. The NRC greatly appreciates the support for its programs and resource needs that this Committee has afforded the agency in the past. We look forward to our continued interactions.

APPENDIX A: ENHANCED DISCUSSION AND ADDITIONAL INFORMATION

The discussions that follow provide the Subcommittee with further details on the activities that we have outlined in this testimony. A table of contents is provided for ready reference to areas of specific interest.

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I. Expectations for a Health and Safety Regulator

The United States Nuclear Regulatory Commission (NRC) was established in 1975 principally because the evolution and development of the nuclear power industry had created a new set of regulatory challenges, requiring the attention of an exclusively regulatory agency to ensure the health and safety of the American public. Created in a time of change, the NRC throughout its existence has engaged repeatedly in reassessment and recalibration in the light of new data and new understanding. In the same way that it demands objective self-examination and effective cor-

rective action on the part of the regulated industry, the NRC recognizes that it must require the same of itself. The 3-years since the initiation of the NRC Strategic Planning and Rebaselining effort in 1995 have been a time of searching self-evaluation, as the agency has prepared to realign its regulatory policies and programs for nuclear power plants, to take into account the variety of changes that will result from the shift to electric utility deregulation and associated utility restructuring.

In recent months, the NRC has been the subject of a number of critiques, some of them sharply critical, from our Congressional appropriations committees, the General Accounting Office (GAO), the NRC Inspector General, the nuclear industry, and other stakeholders. Whether or not one agrees with these criticisms, the NRC believes that they represent valuable input worthy of careful consideration. They also are an appropriate occasion for the agency to continue its own rigorous stock-taking; to assess objectively both the strengths and the weaknesses of NRC regulatory programs and policies; to understand better the impact of those programs and policies on those we regulate; to consider how effectively we have responded to change in the regulatory environment; and to give open-minded and objective consideration to the views and interests of our various constituents.

Many of the criticisms leveled recently have been perceived as driven by pressure from the nuclear power industry, with implied or overt accusations that nuclear power has become economically burdened as the result of NRC over-regulation. On the other hand, the May 1997 General Accounting Office (GAO) report ("Nuclear Regulation—Preventing Problem Plants Requires More Effective NRC Action"), as well as the Union of Concerned Scientists and other constituent groups, have been vocal in criticizing the NRC for a lack of rigor in demanding strict adherence to clear safety standards, and in demanding, if anything, stronger NRC regulatory oversight of its power reactor licensees.

We would submit that, as an independent regulatory agency—regardless of the source of our fees—the NRC must be careful to focus on meeting our legislatively established health and safety mission. While we must be fair in considering the views of all our stakeholders, and while we must endeavor to accomplish our mission as effectively and efficiently as possible, we cannot afford to be propelled back and forth by every current in the river. In other words, given our health and safety mandate, and given the nature of the industries we regulate, we believe there is virtue in being deliberate—not sluggish, but careful and thoughtful—in analyzing, optimizing, and accomplishing the necessary changes to our processes.

In addition, in reviewing the criticisms that have been directed at the NRC regulatory process, it is important both for the NRC and for our stakeholders to keep in mind that the basic processes under criticism are the same processes that have resulted in the licensing and operation of 110 safe nuclear power plants. Today, 104 plants are operating to produce 20 percent of our nation's electricity, with an enviable record in terms of protecting the health and safety of the American people. That should not be taken to imply, by any means, that NRC processes are or should be above criticism—far from it. It does, however, suggest that caution should be exercised before making sweeping changes to ensure that seemingly desirable improvements, made in the interest of increased efficiency or diminished regulatory burdens, do not turn out to have unforeseen adverse effects on the overall objective of ensuring nuclear safety.

II. NRC Response to the May 1997 GAO Report, "Nuclear Regulation—Preventing Problem Plants Requires More Effective NRC Action"

In its May 1997 report, "Nuclear Regulation—Preventing Problem Plants Requires More Effective NRC Action," the General Accounting Office (GAO) emphasized that, in order to achieve the NRC safety mission, it was critical for the Commission to have a high degree of confidence in the ability of its regulatory program to ensure that the nuclear industry performs to high safety standards. The GAO observed that the NRC determination of adequate protection of public health and safety presumptively assumes that licensees will operate their facilities within approved designs and in accordance with NRC regulations. Within this context, the GAO report gave a number of specific criticisms, which included contending:

- that, for some plants, the NRC had not taken aggressive enforcement action to require licensee correction of safety problems on a timely basis;
- that the NRC needed to improve on early intervention and aggressive enforcement action, in order to prevent declines in nuclear plant long-term performance, and in order to increase the assurance that licensees are meeting high safety standards; and
- that the NRC was slow to place plants on the NRC "Watch List."

The GAO report recommended that the NRC develop strategies to take more aggressive action on safety deficiencies when they are discovered. Specific rec-

ommendations included: (1) that NRC inspectors be required to document fully the status of licensee actions to address identified problems, including timetables for the completion of corrective actions and statements as to how the NRC will respond to nonconformances with planned actions; (2) that the NRC make licensee responsiveness to identified problems a major feature of the Senior Management Meetings, to include clarifying the intended NRC response when problems go uncorrected; and (3) that the NRC assess licensee management competency as a mandatory component of the NRC inspection and assessment processes.

As indicated in its written response to the GAO report, the NRC has been developing—and in many cases already has instituted—a variety of improvements to its reactor performance assessment processes that will address most of the GAO concerns. The NRC staff has worked extensively to develop improved performance indicators for use in the assessment of reactor licensees—including performance indicators that focus on the adequacy of licensee corrective actions. The Integrated Review of the NRC Assessment Process for Operating Commercial Nuclear Reactors (referred to as IRAP), is an extensive review by the NRC staff of all existing reactor-related assessment processes. This review is still ongoing, and the final form of the IRAP has yet to be determined; however, in keeping with the recommendations made by the GAO and others, early stages of the IRAP have considered such changes as: (1) streamlining and integrating into a single process the best elements of our current processes; (2) tying specific regulatory actions directly to the assessments made; (3) improving the systematic use and categorization of data; (4) developing and using threshold criteria; (5) focusing on performance results; (6) providing opportunity for licensee response at appropriate stages; and (7) providing for Commission approval of actions taken at the Senior Management Meeting. [For additional detail on the IRAP and other aspects of licensee performance assessment, see Section IV.C of this testimony.]

Other NRC initiatives that relate to the GAO report criticisms involve a renewed emphasis on the purpose and use of the final safety analysis report (FSAR) and a review of NRC practices in following up on licensee commitments. The updated FSAR provides a current reference document to be used in routine safety analyses performed by the NRC, the licensee, and other interested parties. NRC inspection and licensing guidance has been clarified to re-emphasize the use of the FSAR in providing updated licensing basis information for the plant, and the need to review applicable portions of the FSAR and other licensing documents during inspections and licensing reviews. The NRC staff also is reviewing existing NRC processes for identifying, tracking, and verifying licensee commitments made to the NRC, to improve NRC staff and industry understanding and performance in this area. The NRC has begun discussions with the Nuclear Energy Institute (NEI) to determine whether changes in the NEI guidance document on licensee commitments might be mutually beneficial for licensees and the NRC.

In the area of assessing management competency, the Commission agrees that licensee management has a significant effect on plant operation and, by inference, on safety and risk. The NRC role is to provide oversight of generic aspects of utility organization and employee qualifications commensurate with the need to provide reasonable assurance of adequate protection, such as establishing minimum qualification requirements for certain positions. However, as the Commission recently reaffirmed, NRC inspection and assessment does not directly assess licensee management performance or corporate culture. Rather, the NRC inspection program emphasizes conducting performance-based (i.e., outcomes-focused) inspections in broad areas of facility operation and design, and, on the basis of inspection results, draws conclusions about the effectiveness of licensee management processes and controls. In addition, to be clear, NRC regulatory oversight does not extend to NRC involvement in the selection process for licensee managers.

III. NRC Response to the March 1997 GAO Report, "Nuclear Employee Safety Concerns—Allegation System Offers Better Protection, But Important Issues Remain"

The NRC regulatory program places a high value on a work environment, within the licensee community, in which the highest standards of quality, integrity, and safety are understood to be in the best interest of the licensee and its employees and contractors. The NRC allegation program provides a way for individuals working in NRC-regulated activities and members of the public to provide safety and regulatory concerns directly to the NRC. For allegations involving potential wrongdoing, the NRC Office of Investigations (OI) works with the program offices on follow-up, in-depth investigation, analysis, and disposition—including enforcement action. For allegations of discrimination under Section 211 of the Energy Reorganization Act of 1974, the Department of Labor (DOL) provides an investigation and adjudicatory process for complainant redress, and the NRC also may conduct its own

investigation to determine the need for enforcement action. The Commission has taken aggressive action to improve the NRC treatment of allegations, and to promote within the overall licensee community a safety-conscious work environment—in which personnel at any level are encouraged to report concerns, and such that concerns are promptly reviewed, prioritized, investigated, and if warranted, corrected, with appropriate feedback to the individual.

In its March 1997 report, "Nuclear Employee Safety Concerns—Allegation System Offers Better Protection, But Important Issues Remain," the GAO made a number of observations and recommendations for improvement relating to the following general areas: (1) the timeliness of the Department of Labor process for providing complainant redress under Section 211; (2) NRC capabilities for monitoring the allegation process; and (3) NRC knowledge of the work environment at nuclear power plants.

Over the past 18 months, the NRC has made a number of specific changes to its allegation program, some of which were in response to specific GAO recommendations, and some as part of internal NRC initiatives. In general, these changes have focused on emphasizing the importance of the allegation program and improving its implementation, including NRC processes for allegation receipt, documentation, tracking, follow-up, evaluation, and closure. Specific actions include the following:

The NRC Executive Director for Operations issued an announcement to agency employees expressing NRC management expectations for NRC staff handling of allegations, including comprehensive and timely allegation resolution and protection of allegor identity.

The NRC published a brochure that is provided to allegors. The brochure describes the NRC allegation process, the DOL process, and the extent to which the NRC can protect the identity of allegors.

The NRC staff developed and implemented an improved software package that has enhanced NRC capabilities for tracking and trending allegations, including tracking discrimination complaints from receipt through the completion of NRC investigative and enforcement activities as well as through the completion of DOL actions.

Standard training material on the allegation program has been developed and implemented, to ensure that NRC employees were current and knowledgeable on the important aspects of the allegation program, including treating allegors professionally and courteously.

The NRC developed standard formats for correspondence with allegors, to ensure that all necessary topics are discussed and all essential information is included in such correspondence. The format for acknowledgment letters requires a restatement of the allegations as understood by the NRC. Closure letters also now require a restatement of the concern, as well as a description of the NRC basis for closing the concern.

Special cover sheets were developed for allegation correspondence to increase NRC staff recognition of the special handling requirements needed to protect the identity of allegors.

The Senior Management Meeting assessment process was revised to include a discussion of insights gained from the allegation program, to assess licensee performance in establishing and maintaining an environment conducive to raising safety and regulatory concerns.

The NRC also has taken a number of actions specifically designed to improve the follow-up, investigation, and disposition of Section 211 discrimination complaints. The NRC Office of Investigations (OI) has enhanced its overall program in this area by: (1) ensuring an interview with each allegor that has established a prima facie case for Section 211 discrimination (including those under separate pursuit by the DOL); (2) increasing the level of OI involvement in the regional and program office Allegation Review Boards, including the analysis and disposition of discrimination complaints; (3) upgrading the oversight and training of field investigators involved in discrimination investigations; and (4) improving the timeliness and quality of OI reports. Given the complementary DOL jurisdiction in this area, the NRC has been working with the DOL on a range of actions designed to improve the DOL investigative and adjudicatory process. These include: (1) the transfer of Section 211 complaint investigation responsibility from the DOL Wage and Hour office to the DOL Occupational Safety and Health Administration (OSHA); (2) a draft revision to the NRC/DOL Memorandum of Understanding (MOU) related to Section 211 complaints, which I recently signed and forwarded to the Secretary of Labor for her signature; and (3) efforts in progress to develop draft legislation that, among other enhancements, would improve the effectiveness and timeliness for the DOL Section 211 investigative and adjudicatory process.

Within the range of actions described above, the NRC has completed its implementation of all but three of the GAO report recommendations. Actions still in progress or under consideration are as follows:

The NRC and DOL staffs have agreed on draft legislative changes that would make the timeliness requirements in Section 211 of the Energy Reorganization Act more reasonable, and would help to improve the effectiveness and timeliness of the DOL process. The NRC staff currently is preparing a paper that will forward these proposed changes to the Commission for approval and submission to the Congress.

The NRC still is evaluating the GAO recommendation on routinely providing feedback forms in allegation closeout correspondence. Several sample studies have been conducted, and the NRC staff will soon provide a recommendation to the Commission on this matter.

The GAO recommended that the NRC improve its capabilities for assessing the work environment at licensee facilities. The Commission currently is reviewing an NRC staff paper that provides options for addressing this issue.

An additional area needing improvement was revealed when, in January 1998, the NRC staff inadvertently revealed the identities of a number of alleged while responding to requests for information under the Freedom of Information Act (FOIA). The NRC established a special team to evaluate the incident and make recommendations to management. The audit team found a flaw in NRC processes that involved, in essence, two competing interests: (1) the need to ensure that FOIA requests receive a prompt and complete response, in keeping with statutory timeliness and release requirements and the Commission stance on openness and public access to information; and (2) the allegation management program mandate on protecting the identity of alleged. The release of alleged identities occurred because essentially no agency guidance or training existed to address the specific process of redacting allegation-related records when responding to an FOIA request, to prevent the release of alleged identities. In addition, the process for reviewing FOIA responses in the responsible organization had undergone an erosion of administrative barriers that at one time had included additional layers of review. In addition to the lack of procedures and training, NRC management found that there was no single point of accountability to ensure that allegation related material was not released inappropriately.

NRC management considers this to be a serious event that revealed a significant weakness in its processes. Because of the significance of this issue and the broad scope of corrective actions under consideration, the NRC Executive Council has become involved directly in the evaluation and resolution of this issue. The NRC staff is in the process of implementing 30 recommendations with the goal of preventing future releases. While the longer term corrective actions are being evaluated, the levels of review that had eroded have been reinstated and the Agency Allegation Advisor has been identified as the single point of accountability and assigned to review all FOIA responses involving allegation material.

IV. NRC Response to the May 1998 Senate Appropriations Committee Report and Related Studies

As indicated earlier, in recent months, the NRC has been the subject of a number of critiques, beyond the GAO, some of them sharply critical, from Congressional committees, the nuclear industry, and other sources. Some of the principal sources include:

- The June 1998 Senate Committee on Appropriations Report Language
- The June 1998 House Committee on Appropriations Report Language
- A study by Tim Martin Associates

In this section of the testimony, we will attempt to characterize those recent criticisms and to provide, for the record, an objective and thorough response. The criticisms have been grouped into the following categories: (1) risk-informed and performance-based regulation; (2) reactor inspection and enforcement; (3) reactor licensee performance assessment; (4) reactor licensing and oversight; (5) uranium recovery; and (6) NRC organization and management effectiveness and efficiency.

A. Risk-Informed and Performance-Based Regulation

In this topical area, the basic criticisms are summarized as follows:

Licensees expend considerable resources on NRC requirements that are not related to safety or are of low safety significance.

The NRC needs to create a graded safety value scale.

The NRC needs to develop and adhere to clear Safety Goals.

The NRC needs to accelerate the move to risk-informed and performance-based regulation.

The NRC has been moving and will continue to move toward making the entire NRC regulatory framework—related to both nuclear reactor safety and nuclear ma-

terials safety—more risk-informed (i.e., such that areas of highest risk receive the greatest focus), and, where appropriate, more performance-based (i.e., more results-oriented and more open to allowing licensee flexibility in how to meet NRC regulatory requirements). The overall goal of this adjustment in regulatory approach is to enhance safety decision-making, to improve efficiency, and to reduce resources devoted to issues with low safety significance. As discussed below, a significant number of NRC efforts related to risk-informed regulation have been initiated and are ongoing. Nevertheless, the NRC recognizes that the pace of its actions in this area should be accelerated, and that improvements are warranted.

The NRC has been using risk information in some generic and plant-specific regulatory activities for several years. In 1986, the Commission issued its policy statement on Safety Goals which characterized the acceptable individual and societal risk from accidents at nuclear power plants. The Commission recently has approved the development of guidelines for applying the Safety Goals and their subsidiary objectives in plant-specific regulatory activities. In 1993, a Regulatory Review Group (RRG) was established to study power reactor regulations and related processes, placing special attention on the potential for using performance-based requirements and guidance in place of prescriptive requirements and guidance. In its final report, the RRG discussed several areas in which NRC process changes could allow significant reductions in industry and NRC resource demands without adversely affecting the level of safety at operating plants.

As one result, the Cost Beneficial Licensing Action (CBLA) program was created in 1993 to increase NRC management attention and provide a more expeditious review of licensee requests that seek to modify or delete requirements that have a small effect on safety and are costly to the licensee to implement. As of June 29, 1998, of the 305 CBLAs submitted since 1993, 238 have been approved, resulting in cost savings (based on licensee estimates) of over \$1.25 billion over the life of the plants.

An important longer-term effort is the Technical Specification Improvement Plan (TSIP), resulting in the development and use of Improved Standard Technical Specifications (ISTS)—designed to focus NRC and industry resources on the more safety significant aspects of nuclear plant operation. NRC effort and industry input on this initiative began in 1986, and culminated in the initial ISTS publication in 1992, with a revision in 1995. Currently, 56 plants (92 units) have volunteered to convert their plant technical specifications to the ISTS, and 18 plant conversions (involving 28 units) have been approved. Owners groups project annual savings of between \$150,000 and \$1.13 million per site from the program. Plants that have made this conversion incur savings because of less restrictive surveillance (testing) requirements on specified equipment, as well as from the significant decrease in the post-conversion rate of needed license amendments.

In part because of the RRG efforts, the NRC formulated its Probabilistic Risk Assessment (PRA) Policy Statement and its PRA Implementation Plan. The Commission PRA Policy Statement, first proposed in 1994 and published in August 1995, identified the following goals: improved decision-making, more efficient use of NRC staff resources, and reduced burden on licensees. The PRA Implementation Plan, first issued in August 1994, consists of more than 100 initiatives to enhance the use of risk information in regulation of both power reactor and nuclear material licensees, as well as efforts to move appropriately toward more performance-based approaches. In addition, the Commission has encouraged the consideration of risk information in all regulatory activities.

As part of the PRA Implementation Plan, the Commission recently approved for publication generic regulatory guidance, in the form of a regulatory guide and standard review plan, that will support implementation of risk-informed regulation of power reactor licensees, by providing guidance on how to use PRA information to support and evaluate plant-specific changes. In addition to the generic guidance documents, application-specific guidance has been developed and issued for the areas of technical specifications, in-service testing, in-service inspection of piping, and graded quality assurance. Each of these approaches has been proven successful in pilot applications at specific power reactor licensees. In the coming year, the NRC will give increased focus to the review of license amendments and other programmatic changes through the use of these guidance documents.

The NRC also is working with the Nuclear Energy Institute (NEI) on a pilot applications program in which NEI will identify areas where regulatory requirements and plant operations can be simplified with minimal impact on plant safety. The NRC plans to participate in a study by the Center for Strategic and International Studies (CSIS) on risk-informed and performance-based regulation at the NRC, which also should be useful in formulating further recommendations for change.

The Commission also has sought to increase regulatory effectiveness through certain rulemakings. These rule changes have been directed toward incorporating risk-informed and performance-based approaches, where appropriate, as well as toward reducing the regulatory burden associated with overly conservative requirements, and eliminating the need to seek exemption from overly prescriptive requirements. As one example, on September 12, 1995, the Commission approved the issuance of a revision to 10 CFR Part 50, Appendix J, "Primary Reactor Containment Leakage Testing for Water-Cooled Power Reactors." The revision added an option entitled "Performance-Based Requirements," to allow licensees to replace voluntarily the prescriptive testing requirements of Appendix J with testing requirements based both on overall performance and on the performance of individual components. In another instance, the NRC worked with the Department of Transportation to provide procedures under new regulations that enable the shipment of decommissioned reactor steam generators to a disposal facility, without undergoing a specific steam generator transportation certification process. A third example is the NRC Maintenance Rule—made effective in July 1996 and currently undergoing certain proposed revisions—which uses a risk-informed and performance-based approach to ensure the availability and reliability of key structures, systems, and components in power reactor facilities. The NRC will continue its review of existing regulations to identify additional opportunities in which NRC requirements can be made more risk-informed and, as appropriate, performance-based.

The NRC also has revised guidance for reactor inspection activities to incorporate risk insights and to be more performance-based. These revisions provide guidance on using risk insights to help plan inspection activities, to evaluate the significance of inspection observations and findings, to evaluate the adequacy of licensee assessments that have probabilistic risk elements in their bases, and to support enforcement activities. Incorporating risk insights into inspection procedures is expected to result in more efficient NRC inspections, since it will focus attention and resources on the more risk-significant items. Other changes to the inspection program are being pursued, with the overall goal of having a fully risk-informed baseline inspection program.

Finally, NRC staff training in risk concepts and practices is being carried out as part of the PRA Implementation Plan. The NRC has mandated training on risk-informed guidance and policy for NRC management and technical staff, including site resident inspectors. Senior reactor analyst positions also have been established and filled with specially trained PRA specialists in each regional office and in headquarters, to serve as a primary resource for incorporating risk insights and risk perspectives into reactor inspection, enforcement, and assessment activities.

With respect to nuclear materials safety, we have used a variety of risk-informed, and, where appropriate, performance-based approaches to analyze areas of NRC responsibility beyond reactors, including nuclear waste, fuel cycle facilities, and industrial and medical uses of nuclear material. We are developing a comprehensive conceptual framework for applying risk-informed and performance-based regulation in nuclear materials applications. We will use this framework to identify areas in which the increased use of risk-informed methods will enhance safety and regulatory efficiency. For some nuclear materials devices and facilities, the nature of the risks, the types of facilities, or other factors may indicate that more traditional approaches should be used. Overall, we anticipate that this framework will better focus our regulatory resources on the most risk-significant aspects of nuclear materials usage.

In summary, the Commission remains committed to making the entire NRC regulatory framework more risk-informed and, where appropriate, more performance-based. Short-term actions are being implemented to increase the priority, management attention, and pace of implementation. These include steps to ensure more prompt review of risk-informed reactor licensing submittals, the establishment of a lead Project Manager for the coordination of risk-informed and performance-based licensing actions, and a management oversight steering committee to provide policy, technical and priority guidance on risk-informed regulation. We will continue to pursue longer-term activities as identified in the PRA implementation plan.

B. Inspection and Enforcement

Inspection.—The power reactor inspection program serves an important role in enabling the NRC to fulfill its mission of ensuring public health and safety. This program is designed, through audits of licensee activities, to identify safety problems independently at an early stage, before significant safety events occur. The NRC has defined the minimum set of inspections necessary to meet this objective as the Core Inspection Program. Core inspections are performed at all sites, independent of licensee safety performance. These inspections are intended to emphasize observation and evaluation of those ongoing facility operations and supporting activities that are

most important to reactor safety. The NRC uses additional inspection effort (beyond the core program) on a plant-specific basis to gain additional insights into licensee performance in selected areas in which (1) the core program has identified problems; (2) off-normal events require follow-up; or (3) emerging safety issues require resolution.

In this area, the basic criticisms are summarized as follows:

As nuclear power plant safety and efficiency have improved, regulatory burdens have not decreased in a commensurate manner.

The level of inspection effort at reactor power plants does not vary in keeping with variations in actual plant safety performance.

The NRC inspection program focuses on some activities with very low impact on safety.

The NRC recognizes that the safety performance of U.S. nuclear power plants has improved over the past decade as the industry matured. In fact, we believe that NRC oversight has contributed to and helped to maintain that improvement. The average number of NRC inspection hours per plant has been reduced, from 3,100 in 1990 to 2,500 in 1997, and we are evaluating further reductions to the inspection program. However, part of the NRC caution in approaching these reductions is based on past experience—in which, when the NRC reduced its focus on a given area, some licensees also reduced their vigilance in that area, with the result that performance declined. A recently identified example was the decline in attention that had occurred, across the industry, on maintaining the facility design basis. In addition, we note that, while overall safety performance has improved, some plants continue to experience significant problems. These plants require significant agency resources for the identification of safety issues and follow-up of licensee corrective actions. Based on these types of concerns, we believe it is essential to use a risk-informed approach in any further inspection program reductions.

In response to concerns about the distribution of inspection hours, the NRC improved the inspection planning process during the early part of this decade. These improvements were designed to increase the gradient between the amount of inspection received by the best performing plants and plants that experienced performance problems, as well as to provide a performance-based allocation of inspection resources (beyond the core inspection program). Currently, inspection effort for plants experiencing performance problems significantly exceeds the core inspection program.

Notwithstanding the changes made to date, we acknowledge the need for additional improvements, and the NRC has both short- and long-term actions underway to address the concern with the inspection program focus, including the focus of the core inspection program. The inspection program has shifted away from programmatic reviews toward a more performance-based approach. The NRC also has initiated several activities to increase the incorporation of risk information into inspection planning and execution. The NRC has issued guidance on risk-informed inspection practices, providing inspectors with expectations and guidelines on (1) the relationships between PRA and defense-in-depth, (2) the integration of non-probabilistic considerations with PRA, (3) the communication of PRA insights to licensees, and (4) the expected level of inspector PRA use. In addition, as mentioned earlier, several training courses have been developed for inspectors and managers, to increase the NRC staff level of understanding on PRA uses in various regulatory applications.

As a longer-term action, the NRC will review its inspection program, including program structure, focus, and requirements/procedures, beginning in October 1998. This review is intended to determine whether the inspection program achieves its intended goals, to identify and eliminate unnecessary inspection requirements, to improve the risk-informed focus, and to improve program efficiency.

Enforcement.—NRC enforcement jurisdiction is drawn from the Atomic Energy Act of 1954, as amended, and the Energy Reorganization Act (ERA) of 1974, as amended. The NRC enforcement program supports the NRC safety mission by seeking to prevent, at NRC-licensed facilities, events with impact on public health and safety, through deterrence, through prompt problem identification, and through prompt, comprehensive corrective action.

The NRC Enforcement Policy seeks to support this overall goal, articulated in the NRC Strategic Plan, by addressing non-compliances in a graded approach. The enforcement process begins by categorizing the significance of each violation, within the context of associated inspection findings. Four levels of severity are used to differentiate violations according to their safety significance. Severity Levels I, II, and III are used to characterize violations of significant concern, and violations at these levels (referred to as “escalated enforcement actions”) also may result in civil penalties. Severity Level IV violations, which individually are somewhat less significant

(and are referred to as "non-escalated actions"), may result in Notices of Violation, but do not result in civil penalties. Violations considered to be of minor concern do not result in formal enforcement action, and generally are not documented. To provide incentives for licensees to promptly identify and correct problems associated with violations, decisions on whether to issue a civil penalty for a significant violation, as well as decisions on whether to issue a Notice of Violation for a less significant violation, are based largely on the associated licensee efforts to identify and correct the circumstances that led to the violation.

Within this graded approach, it is important to consider that the NRC does not find it appropriate to wait for an event or an actual safety consequence before taking enforcement action. The primary reason for taking action on Severity Level IV violations is to identify and correct problems early (as well as to track emergent trends) in the interest of deterring more significant issues. As a result, when evaluating the significance of a violation, NRC considers not only the direct consequences of the specific as-found condition, but also the potential safety consequences, or risk. In addition, the NRC considers whether the violation involved repetition, willfulness, pervasiveness, licensee management involvement, or other characteristics that may make the violation more safety significant.

Within this area, the basic criticisms are summarized as follows:

The NRC needs to abandon its unsound reliance on an approach that rigidly demands strict compliance with the regulations, regardless of safety significance.

Similarly, the NRC focuses unduly on "paper compliance" rather than emphasizing risk-informed considerations.

The recent sharp increase in the number of violations reflects a changing NRC culture, and is not consistent with the continuing improvements in industry safety performance.

The cost of responding to violations of low severity is excessive.

NRC civil penalties are excessive.

The NRC enforcement program is overstaffed.

The NRC enforces regulations inconsistently.

As stated above, the NRC uses enforcement to emphasize to its licensees the need to prevent violations, and when violations occur, the need to identify and to address the issues associated with them before they manifest themselves as significant events or challenges to safety systems. However, because most of the violations identified are relatively low-level, the majority of enforcement actions issued are low level. The NRC recognizes the resource demands associated with responding to these non-escalated enforcement actions, and has taken several short-term actions to reduce the licensee burden in this area. The efforts underway (some of which merely involve exercising self-discipline in carrying out existing NRC policy) include: (1) ensuring that the NRC staff gives credit for licensee actions in both identifying and correcting violations in deciding whether to cite a low-level violation; (2) not requiring a written response when low-level violations are issued and corrective actions are addressed sufficiently in writing elsewhere on the docket (e.g., in a Licensee Event Report); (3) providing more consistent treatment when multiple violations are identified with a common root cause; and (4) clarifying NRC staff guidance for the treatment of violations identified as the result of licensee corrective actions. In short, the intent is to simplify the disposition of these types of violations. In addition, as part of ongoing efforts, such as the NRC enforcement policy revision and request for public comment issued in May 1998, the NRC will seek to identify other measures to improve consistency and to ensure a safety focus in documenting and dispositioning violations. The intent is to encourage prompt identification of problems, to ensure corrective action commensurate with risk, and not to have problems linger which could have a cumulative safety impact. The intent of enforcement is to improve performance. The short-term and long-term actions the NRC has underway should address the greatest concerns. We are expediting these changes.

The NRC recognizes that civil penalties have increased since the 1995 revision to the Enforcement Policy. A significant factor in this increase appears to be due to increased headquarters involvement in the evaluation process, which has improved region-to-region consistency but also has resulted in the increased identification of situations that warrant escalated action. In general, the NRC believes that its practices involving Severity Level I, II, and III violations and civil penalty assessments are appropriate. However, as part of the improvements discussed in this area, the NRC intends to consider the need for additional changes in the escalated enforcement process.

For licensees and other stakeholders, the area clearly of more concern has been the sharp increase in the number of non-escalated enforcement actions from 1995 to 1997. In fact, the NRC does not believe that this increase reflects a decline in reactor safety performance. Rather, the increase is due, at least in part, to our ef-

forts to improve the quality and consistency of the inspection and enforcement programs and to an increased focus on compliance. Inspection guidance issued in fiscal year 1996 resulted in a significant improvement in the consistency of documenting inspection findings, which in turn resulted in additional violations. Also, following pivotal inspections at the Millstone Station and other facilities, NRC management placed a greater focus on ensuring that the nuclear plant licensing basis has been maintained, including maintaining an accurate Updated Final Safety Analysis Report. Special initiatives, such as maintenance and design inspections, also have contributed to the increased number of violations. The unanticipated increase in Severity Level IV violations has led to a sharpened focus on long-standing issues related to non-escalated enforcement actions, issues which go back over a number of years.

The NRC has recognized for some time that the relative consistency of Enforcement Policy implementation associated with Severity Level I, II, and III violations is not demonstrated to a commensurate degree for non-escalated actions. Historically, the level of enforcement staff resources has only allowed oversight of enforcement actions of higher significance. The resulting minimal oversight of low level enforcement activities, typically comprising approximately 90 percent of all enforcement actions, has allowed inconsistent enforcement practices to develop. In recognition of this problem, additional staffing was added to the enforcement staff within the past several months, to oversee, in part, the consistency and control of low-level violations. As an additional measure, the NRC has increased the headquarters oversight and coordination of the appeal process for disputing low-level violations issued by NRC regional offices, ensuring the opportunity for a headquarters review of licensee disputes regarding whether a violation actually exists, its severity level, or the appropriateness of the sanction. To ensure consistency in the specific areas of the Maintenance Rule and 10 CFR 50.59, special enforcement review panels have been established to review all associated potential enforcement actions.

Additional efforts planned in this area include: (1) further meetings with stakeholders to obtain additional perspectives on enforcement and to consider the need for further change; (2) improvements to existing guidance on the threshold separating Severity Level IV violations and minor violations; (3) the development of additional guidance on how risk insights should be factored into enforcement decisions, as well as on the use of "regulatory significance" in evaluating enforcement actions; (4) additional training on the results of these changes and initiatives; (5) internal audits of the consistency of issuing low-level violations; and (6) closer coordination between inspection and enforcement activities.

Summary.—In summary, the NRC is aware of the impact and resource demands that the inspection program place on its licensees, and plans to institute a comprehensive review of this program. The NRC also is mindful of the licensee burden associated with NRC enforcement actions. As described above, we will reinforce existing policy provisions and seek additional measures to ensure that enforcement actions are not unnecessarily burdensome, and we will focus on ensuring that NRC enforcement actions are based appropriately on safety significance. Further review of the enforcement program will be conducted as described above. Program changes and training for both inspection and enforcement will emphasize a risk-informed and performance-based approach.

C. Reactor Licensee Performance Assessment

Inspection, enforcement, and assessment all play a role in evaluating reactor licensee performance to provide reasonable assurance of the adequate protection of public health and safety. The specific role of assessment is to integrate individual insights, and to arrive at an overall conclusion (broader in scope and/or longer in term) with respect to licensee safety performance. Currently, the NRC uses several processes to assess the safety performance of nuclear reactors, including: (1) Plant Performance Reviews (PPRs), conducted every 6 months by regional managers; (2) Systematic Assessments of Licensee Performance (SALPs), conducted every 12 to 24 months by agency middle managers; and (3) Senior Management Meetings (SMMs), conducted every 6 months by agency senior managers, until recently, when the Commission directed that SMMs be held annually. These processes were developed and implemented at different times over the past 18 years to address specific agency concerns, each intended to strengthen the NRC assessment of plant performance and to identify performance issues, in order to focus agency resources on plants warranting additional inspection, and to ensure that problems are corrected before a serious decline in nuclear safety emerges.

Within this area, the basic criticisms are summarized as follows:

NRC reactor performance assessment processes lack clear, objective assessment criteria.

Specifically, the NRC has no clearly defined criteria for placing nuclear power plants on the NRC "Watch List."

NRC reactor performance assessment processes are too resource intensive, both for licensees and for the NRC.

In general, the NRC agrees that these criticisms form the basis of specific agency initiatives that are intended to address these very concerns. These initiatives are discussed below.

In 1996, the Commission directed that a study of the SMM process be performed. A consultant, Arthur Andersen, conducted a study and recommended a number of improvements. Many of these recommendations have been incorporated, including: (1) increased emphasis on objective, quantitative information; (2) development and use of performance indicator trending methodology; (3) increased participation at the SMM to ensure a broad perspective; (4) improved process facilitation at SMMs; and (5) improvements to the quality and format of the data provided to SMM participants.

The focus on increasing the objectivity of the SMM process led to additional scrutiny of the entire NRC function of reactor performance assessment. While each of the NRC assessment processes has been subject to periodic, detailed reevaluation, it became clear that the agency had never conducted an integrated review of the entire assessment function. Recognizing the need for such a broad-scope review, in 1997 the Commission initiated an Integrated Review of the NRC Assessment Process for Operating Commercial Nuclear Reactors (referred to as IRAP). The IRAP was conceived as a two-phase effort, with the objective of the first phase being the development of a single, integrated assessment process that is more objective, more scrutable, and less resource intensive than the current mix of processes. Phase two, scheduled to begin in October 1998, will direct a similar level of scrutiny at the NRC reactor inspection program.

Early in the concept development stage, the NRC met with representatives from the Nuclear Energy Institute (NEI), the Union of Concerned Scientists, and other members of the public to get their views on the objectives, scope, and outputs of NRC assessment. In March 1998, the IRAP team forwarded an initial assessment concept to the Commission for consideration. The Commission directed the NRC staff to solicit public comments on this proposal, and provided general principles for assessment activities. As development of the process continues, the NRC plans to conduct meetings and workshops with the public and the industry, and to discuss possible alternative approaches, including a recent NEI proposal on risk-informed and performance-based reactor licensee oversight.

The current assessment processes depend on both qualitative and quantitative information. Recognizing the value of clear, quantitative assessment criteria, the Commission already has initiated several improvements to the current assessment processes to improve objectivity, consistency, and scrutability. The improvements include: (1) an increased focus on plant safety performance indicators; (2) more systematic processing and comparison of regulatory performance data in the areas of human performance, enforcement, allegations, and risk; and (3) a structured analysis of performance data in a publicly released plant issues matrix (PIM) for each plant.

The NRC will continue to work with its stakeholders to identify and develop quantitative indicators. As progress is made, the shift to a more quantitative set of measures will continue. However, existing high-level quantitative performance indicators are slow to respond to actual declines in safety performance (in some cases involving multi-year response times). Most of the current performance indicators are event-based and do not provide a leading indication of trends in licensee safety performance. GAO reports in the past have been critical of the lack of leading indicators in the NRC performance assessment process. Therefore, although NRC will increase the use of quantitative information, we also will continue to make use of qualitative insights. The Commission has directed the NRC staff to work closely with NEI to determine the merits of their proposal for an assessment process based on quantitative performance indicators. This action is currently in progress.

In addition, as noted above, the SMM has been moved from a semiannual to an annual schedule beginning in fiscal year 1999. This adjustment coincides with other changes to the various NRC assessment processes, and is commensurate with the overall improvement in industry performance and the slow rate of change in the performance of individual plants. This short-term change will result in some resource savings; however, we hope to achieve more dramatic resource savings from the successful development and implementation of the integrated assessment process discussed above, particularly as redundancies in the current processes are identified and eliminated. As these changes are implemented, the NRC periodically will review their effectiveness and continue to solicit stakeholder input on emerging issues of concern.

Since the inception of the NRC performance assessment processes (following the Three Mile Island Accident), the agency has periodically reviewed, sought stakeholder feedback, and made changes where appropriate. Recent criticisms and self-evaluations indicate that some additional improvements are warranted to improve objectivity and to enhance efficiency and effectiveness, while maintaining the global objective of the current processes—that is, to evaluate reactor licensee safety performance to ensure the adequate protection of public health and safety.

D. Reactor Licensing and Oversight

Regulatory Processes.—The NRC strives to maintain open communications with its stakeholders regarding their concerns related to NRC consistency in implementing its regulations. Past NRC actions to address these concerns include: (1) the development and publication of the Standard Review Plan and associated regulatory guides to provide guidance on implementing the regulations; and (2) the Regulatory Review Group and National Performance Review Group studies of regulations and related processes. Other measures, such as the backfit rule (10 CFR Part 50.109), have been designed to balance the NRC focus on protecting public health and safety with the burden of implementing that focus.

The NRC does not, and legally cannot, impose requirements except in accordance with applicable statutory requirements such as the Atomic Energy Act and the Administrative Procedure Act. NRC requirements can only be promulgated in the form of regulations, licenses and license conditions, or orders. However, certain NRC regulatory processes, while not actually imposing legally binding requirements, can be perceived as pressuring a licensee to take actions that exceed regulatory requirements in order to resolve the immediate situation. Such situations are perceived, at times, as imposing de facto requirements on the licensee, and have been the focus of criticisms that the NRC is over-regulating or creating undue regulatory burden for its licensees. Recent criticisms in this area are summarized as follows:

The NRC has implemented informal processes that bypass formal procedures, thereby, in effect, imposing requirements inappropriately.

The NRC should not impose virtual backfits without a formal backfit analysis.

The NRC uses Confirmatory Action Letters to impose conditions on licensees even in situations where the NRC is aware that enforcement action could not be supported.

The NRC agrees that a number of regulatory processes should be reevaluated in an effort to ensure they are not creating an inappropriate burden on its licensees and the NRC staff while maintaining an appropriate level of safety. Examples of regulatory processes in which such burdens can originate include NRC generic communications, Confirmatory Action Letters, diagnostic inspections, and the SALP process (discussed in Section IV.C of this testimony).

NRC generic letters and NRC bulletins legally can require that information be provided to the NRC, but legally cannot create a new requirement for a specific course of action to resolve an issue. Generic communications have been used, however, to provide new or clarified interpretations of existing requirements. The NRC recognizes, further, that the production of information itself can be burdensome, and that the actions requested, in some instances, can be construed as the imposition of new requirements. As a result, the NRC has adopted measures that internally challenge the need for each generic communication, and provide the industry and the public with the opportunity to comment on the actions requested and on their cost and safety benefit. In addition, proposed generic letters and bulletins now are reviewed and discussed by NRC executive management at the earliest stages of formulation. These controls are intended to ensure that, if a proposed generic communication is approved for further development, the requested actions and the required response are commensurate with the safety significance of the issue involved. Equally important is the publication of proposed generic letters and bulletins for public comment, to ensure that efforts to reduce unnecessary regulatory burden do not result in inappropriate reductions in safety margins. Ultimately, the Commission is informed prior to the issuance of each generic letter. An NRC self-assessment is in progress which, in part, will focus on the development of generic communications.

If the NRC were to impose on a licensee a new interpretation of an existing requirement without adding a new regulation (for example through a generic letter), the NRC first must meet the requirements of 10 CFR 50.109 relating to plant-specific backfits. In most cases these new interpretations are issued for comment before they are imposed on other licensees. Backfits that require a regulatory analysis must be approved by the NRC Executive Director for Operations before being forwarded to the licensee, and a process exists for the licensee to appeal the imposition of any backfit.

A Confirmatory Action Letter (CAL) is sent by the NRC to a particular licensee to confirm and document a commitment by that licensee to take certain actions in

response to an identified safety or regulatory issue. Properly used and written, a CAL does not impose legally binding and enforceable requirements. Rather, it documents the NRC understanding of a voluntary licensee commitment to actions that will resolve the issue. The NRC and the licensee should discuss and agree on the actions necessary or appropriate to address the underlying issue. In fact, one of the functions of a CAL is to ensure that no misunderstanding arises about the actions to which the licensee is committing. The licensee is not required to make any commitments, but may choose to do so as a means to resolve the issue without the need for more formal NRC action to address the underlying issue. If the licensee chooses not to commit to actions that resolve the issue, the NRC must decide whether its obligation to ensure adequate protection of public health and safety warrants more formal action, such as the issuance of an order, to require the licensee to address the underlying issue. The licensee has administrative and legal recourse if it disagrees with the NRC action.

Used appropriately, CALs have proven to be an effective regulatory tool to ensure that a licensee promptly addresses identified safety issues. Properly used, CALs should serve the interests of licensees, the NRC, and the public. However, the NRC acknowledges that a licensee may agree to a CAL and the associated actions simply to avoid lengthy discussions with the NRC over plant readiness for restart. In this context, a commitment to an action outside regulatory requirements (or that is perceived to be outside regulatory requirements) may appear to be the most expedient course of action. To ensure that CALs are used in an appropriate manner, the NRC intends to re-emphasize to NRC management and staff the proper use and wording of CALs. There also will be increased NRC management oversight of the issuance and implementation of CALs. The NRC also will examine the need for establishing a threshold for issuing a CAL. Licensees are encouraged strongly to bring any future concerns related to CALs to the attention of NRC senior management and the Commission.

In keeping with its obligations to the public it serves, the NRC conducts its business in open forums whenever feasible. The NRC will maintain an open dialogue with the public and industry concerning its regulatory processes.

Design Basis Information.—In this topical area, the basic criticisms are summarized as follows:

The NRC has reinterpreted improperly what constitutes design basis information. The NRC review of design baselines is unduly burdensome, and is unproductive in terms of safety benefit.

The NRC should define its requirements in this area.

To place these criticisms in perspective requires at least a brief historical context. In the mid-to-late 1980's, the NRC identified concerns that certain design basis information was not being maintained properly, and that plant modifications were being made without the licensee having a complete understanding of the plant design basis. These NRC findings heightened awareness in the nuclear power industry of the need to improve the adequacy of design documentation. Many licensees voluntarily initiated extensive efforts to retrieve and reconstitute the design basis information for their plants. To assist the industry in performing design basis improvement programs, the Nuclear Management and Resources Council (NUMARC), the predecessor to NEI, developed guidelines providing a standard framework for licensee programs to improve design basis information.

In late 1991, the NRC evaluated whether rulemaking, guidance, or a policy statement was needed to address this need for licensees to retain accurate design bases information. In August 1992, the Commission issued a policy statement concerning the adequacy and availability of design basis information, stressing the importance of maintaining design basis information and recommending that all power reactor licensees assess the accessibility and adequacy of their design basis documentation. In the same time-frame, the 1991 Regulatory Impact Survey highlighted the regulatory burden on licensees occasioned by NRC team inspections, with the result that, over the next several years, the NRC reduced its effort to conduct specific, design-related team inspections. Instead, issues related to maintaining accurate and accessible plant design documentation were addressed principally as elements of inspection and follow-up of operations-related activities.

During a number of inspections in 1995, inspectors found, in some cases, that design bases were not being maintained or adhered to appropriately. As a consequence of this new information, the NRC recognized that voluntary industry efforts to improve and maintain plant design basis information had not been effective in all cases. In October 1996, the agency issued 50.54(f) letters to power reactor licensees, requesting that they submit information that would provide the NRC added confidence and assurance that facilities were being operated and maintained within their design bases, and that any deviations were being reconciled in a timely man-

ner. Licensee responses were used to prioritize selected team inspections that focused on design issues of risk-significant safety systems. These inspections resulted in significant findings, which included, among other things: (1) plant modifications or evaluations that had resulted in operation outside the design basis; (2) modifications or evaluations resulting in safety systems not being able to perform their intended safety functions; and (3) inadequate testing of safety-related components. Some of the findings resulted in declaring equipment or systems inoperable, requiring plant modifications and resulting in voluntary or technical-specification-required plant shutdown. These findings were detailed to the nuclear power industry in Information Notice 98-22, issued June 17, 1998. Although licensees expended significant resources to document their design bases, significant safety issues were found and corrected that otherwise might have gone undetected.

The NRC has concluded that past efforts may have provided short-term emphases rather than long-term resolution to the issue of adequacy of design-basis information. In addition, initiatives such as risk-informed and performance-based regulation emphasize the importance of a common understanding between the NRC and its licensees on the maintenance and application of design-basis information within the regulatory framework. The NRC believes, however, that a combination of recent and upcoming NRC actions will contribute to the final resolution of this issue.

Among the short-term improvements associated with the plant design basis and the related regulatory framework, the NRC has: (1) issued revised guidance to the industry explicitly discussing the evaluation process to be used in resolving degraded and nonconforming conditions at power reactor facilities; (2) held a Commission-level meeting with the Nuclear Energy Institute (NEI) in June 1998 to discuss issues related to design basis information; and (3) held a working-level meeting with NEI to resolve outstanding issues, with the goal of endorsing NEI guidance that would clarify what types of information should be considered design basis information.

In the longer-term, the NRC intends, as one significant measure, to provide more specificity and flexibility in 10 CFR 50.59, the regulation under which licensees can make changes to their facilities and procedures without NRC approval. The NRC will support the completion of an industry guidance document related to design-basis information. In addition, the NRC intends to develop an Advance Notice of Proposed Rulemaking that would solicit public comment on possible rule changes. These rule changes are intended to clarify which design or analysis deficiencies require reporting, and to specify the timeliness of such reporting.

Power Reactor License Renewal and NRC Adjudicatory Processes.—Although the NRC only recently received its first two applications for the renewal of power reactor licenses, preparations for license renewal has been a long-term effort. Within this specific context, as well as more generally, NRC adjudicatory processes have been a target of criticism. The basic criticisms in this area are summarized as follows:

NRC adjudicatory processes take too long, and cost too much.

Specifically, the Atomic Safety and Licensing Board (ASLB) is too costly for the benefit it provides.

Legislative-style hearings should replace NRC adjudication processes.

The review process for power reactor license renewal applications is an appropriate arena in which to implement new adjudicatory procedures.

The Commission has been working to pursue the implementation of measures that would streamline the hearing process—both in anticipation of license renewal applications and in general. The Commission has issued a policy statement clearly delineating Commission expectations with regard to the conduct of adjudicatory proceedings, including license renewal proceedings. In addition, the Commission intends to provide guidance to licensing boards in individual proceedings, to ensure that proceedings are conducted in a fair and efficient manner, and that they result in adequate records for decision. Provisions also have been made for the timely identification of any open generic policy issues for Commission decision, and effective integration of the technical review and adjudicatory schedules. As a result of these actions, the NRC expects to complete the review of the initial license renewal applications, including the safety review, environmental review, and public hearing, within approximately 30 to 36 months from the receipt of the application. Based on that experience, the Commission expects that the review process for subsequent applications will be more efficient. Finally, we recognize that the NRC is unique among Federal health and safety regulators in the degree to which we historically have used judicial trial-type procedures to resolve technical issues. We will examine whether changes (including legislation) would be appropriate to expand our use of more informal or legislative-style hearings in licensing proceedings.

In the specific area of power reactor license renewal, the Commission recognizes that permitting plants to operate for an additional 20 years, where appropriate, may be an important factor in ensuring a diverse energy mix for the nation in the future. Nuclear power plants produce approximately 20 percent of all electric power produced in the United States. Approximately 10 percent of the current operating licenses will expire by the end of 2010, and more than 40 percent will expire by 2015. License renewal also may be important to the economic viability of a utility because of the additional time over which its investment can be amortized.

To prepare early on for this possibility, the NRC issued the license renewal rule (10 CFR Part 54) in 1991, to establish the technical and procedural requirements for renewal of operating licenses. Based on initial experience in implementing the rule, the Commission recognized that a more stable and predictable regulatory process for license renewal could be established, and amended the rule in 1995, to limit the scope of the license renewal review to particular time-dependent design analyses, and to aging management of long-lived passive structures, systems, and components. Additionally, the NRC environmental regulation (10 CFR Part 51) was amended in 1996 to focus our environmental review process for license renewal. This revision streamlined the environmental review process by having a large number of environmental issues addressed in a Generic Environmental Impact Statement, thereby eliminating the need for such issues to be addressed individually by each license renewal applicant.

Up to this point, the industry approach to license renewal has been to submit for NRC approval plant-specific and generic technical reports on specific topics, before submitting complete license renewal applications. This approach was intended to establish a foundation of technical information that a licensee can use to evaluate the feasibility of a license renewal application, and to reference that information later in the application itself. On April 10, 1998, Baltimore Gas and Electric delivered the first license renewal application for their two-unit Calvert Cliffs plant to the NRC. Subsequently, on July 7, 1998, Duke Power Company submitted a license renewal application for their three-unit Oconee plant. Additionally, the Southern Nuclear Operating Company recently announced plans to consider license renewal for its two Hatch units. This means that license renewal is no longer a theoretical exercise. Therefore, our focus has changed. The NRC is working to ensure that a disciplined license renewal path exists, fair to all parties involved and focused on the technical merits of the applications.

To that end, the Executive Council of the NRC (comprised of the Executive Director for Operations, the Chief Financial Officer, and the Chief Information Officer) has been tasked to ensure that the implementation of license renewal is a unified and coherent process. These senior managers will focus on three areas: oversight, coordination, and strategic implementation. I reminded the Executive Council to ensure that policy matters warranting Commission attention are promptly identified and communicated to the Commission. In addition, the NRC Chief Financial Officer and Chief Information Officer have been tasked, under the aegis of the Executive Council, with establishing a process for efficiently shifting or refocusing resources, as needed, to ensure a timely license renewal review.

The Nuclear Energy Institute continues to sponsor various industry initiatives for license renewal, and has established an industry working group to address license renewal issues. The NRC has developed new practices and procedures for the conduct of the license renewal reviews. These procedures include specific provisions to identify and prioritize generic technical issues in support of, and without jeopardizing, the aggressive review schedules established for the initial renewal application reviews. These practices also are derived from and build upon the broader improvements to the reactor licensing process, previously described.

In summary, the Commission believes that these measures, including the measures designed to streamline NRC adjudicatory processes, will be effective in ensuring a technically sound but timely process for power reactor license renewal.

E. Uranium Recovery

In this area, the basic criticisms can be summarized as follows:

The NRC may have expanded inappropriately the scope of its reviews.

The NRC has interpreted the law inappropriately to limit the use of mill tailings impoundments for other radioactive wastes.

The NRC inappropriately imposes an economic feasibility requirement on some applicants.

The scope of NRC reviews, particularly its authority for regulating the ground-water aspects of in situ leach (ISL) facility operations, is based on the Atomic Energy Act (AEA) provisions for NRC regulation of the production of uranium. The Uranium Mill Tailings Radiation Control Act (UMTRCA) and the National Environmental Protection Act of 1969 reinforced the NRC regulatory authority provided by

the AEA. Currently, the NRC is working with individual States to identify ways in which we can rely on State reviews of ground-water protection at ISL facilities. By doing this, we believe that we can eliminate dual regulation between the NRC and the States.

Although the NRC agrees that it can be in the national interest to use mill tailings impoundments as disposal sites for AEA waste other than 11e.(2) byproduct material, one consideration should be willingness of the Department of Energy (DOE) to take possession of these sites under current statutes. Under UMTRCA, the long-term custodian (i.e., the State, or the DOE if the State refuses) is only required to take 11e.(2) byproduct material. If other material is placed in the cell, the long-term custodian must agree to take the cell for long-term care. In the past, the DOE has been hesitant to do so, since this could create a situation of perpetual dual regulation. The DOE has agreed to allow the disposal of hazardous material at one mill site. However, such disposal required permitting by the U.S. Environmental Protection Agency, and a perpetual indemnification from the licensee guaranteeing clean-up. In September 1995, the NRC staff issued guidance outlining criteria that would allow for disposal of material other than 11e.(2) byproduct material in mill tailings impoundments. The NRC staff currently is reviewing these criteria, to determine whether they can be made less restrictive without creating a situation in which mill tailings sites would be subject to dual regulation.

The NRC does not impose an economic-feasibility requirement for the processing of alternate feedstock material at uranium mills; however, existing NRC guidance provides that a licensee must certify that it is processing alternate feedstock for its uranium content. The guidance describes plausible grounds for making this certification, which include financial considerations, high uranium content of the alternate feedstock, or other bases.

This issue is of particular concern to the State of Utah, which filed a petition to intervene on an application for processing alternate feedstock. The Utah petition raised concerns that, by taking alternate feedstock, the licensee was operating a low-level waste disposal cell, which was under regulatory authority of the State of Utah. Utah argued that, to avoid State regulation, the licensee was processing the material to change its legal definition to 11e.(2) byproduct material. Recently, the NRC has granted a uranium mill authority to process alternate feedstock. As a result of this action, the NRC has received letters of concern from Congressmen James V. Hansen and Merrill Cook; from the Speaker of the State of Utah House and President of the State of Utah Senate; from the County Council in Tooele County, Utah; from the Utah Department of Environmental Quality; and from the Navajo Nation. Because the processing of alternate feedstock material is controversial, and in order to ensure that NRC-licensed uranium mills do not undertake processing of material simply to avoid other regulatory requirements, the NRC requires the certification test discussed above.

These issues have been recently raised to the Commission in a white paper submitted by the National Mining Association (NMA). The NRC believes that additional progress can be achieved on licensee and stakeholder concerns related to uranium recovery facilities. To that end, in early fiscal year 1998, the NRC initiated an evaluation of the entire regulatory framework for uranium recovery facilities. This evaluation includes the issues identified in the NMA white paper. As part of the evaluation, the NRC will hold public meetings in Texas, Colorado, New Mexico, and Wyoming to discuss the regulatory framework for uranium recovery. From this dialogue, the NRC intends to enhance the effectiveness and efficiency of the uranium recovery regulatory program. The NRC staff has prepared and the Commission is reviewing an overarching risk goal for the decommissioning of uranium recovery facilities.

F. Organization and Management Effectiveness and Efficiency

In this overall topical area, the basic criticisms can be summarized as follows:

The NRC needs a significant, agency-wide review.

The NRC has done little to respond to previous internal and external reviews.

NRC staffing should be sharply reduced, particularly in the areas of management and support, human resources, finance, and professional staff. Reorganization to combine groups according to processes would add efficiency.

NRC research efforts should decrease to reflect industry maturity.

NRC involvement in international activities is excessive.

Even with severe budget cuts, NRC staffing would exceed that of the nuclear regulatory bodies of other countries.

In responding to these criticisms, we begin by noting that the NRC is responsible for the regulation of a complex technology and, as a result, one might expect that differing views will exist as to what are the best regulatory solutions to various issues. However, the NRC historically has initiated programs and processes designed to assess its own regulatory requirements and framework, to determine whether ad-

justments can be made to improve safety, to reduce unnecessary licensee burden, and to improve NRC efficiency. Particularly in recent years, the Commission has been active in seeking ways to improve its regulatory effectiveness and efficiency.

Organization and Planning.—In August 1995, the Commission initiated a Strategic Assessment and Rebaselining review. Designed to be introspective and self-critical, this full-scope analysis explored the relationship of agency programs to Congressionally mandated authorities and responsibilities, with the objective of providing a solid, reliable foundation on which to base a strategic framework for future decision-making. This study was used as the foundation for developing the NRC fiscal year 1997–2002 Strategic Plan, the fiscal year 1999 Performance Plan, and program-level outcomes-focused operating plans.

Another NRC organizational tool, a key component in ensuring effectiveness and efficiency, is the agency-wide Planning, Budgeting, and Performance Management Process (PBPM). As a natural outgrowth of the Strategic Assessment and Rebaselining initiative, the PBPM allows the agency to implement the Government Performance and Results Act (GPRA) and other Congressional and Administration initiatives that demand greater accountability for results. The PBPM involves the following four main components:

- Setting the strategic direction and performance expectations for the organization;
- Determining the programs, resources and planned accomplishments needed to meet those expectations;
- Measuring and monitoring performance against the established expectations; and
- Assessing performance in light of lessons learned and applying the results.

This builds in accountability for the accomplishment of work, and provides a direct means to refocus work or to re-deploy resources to adjust to emergent or competing demands.

Information Technology and Information Management.—The NRC has changed its process for information management and the for the deployment of information technology, and thereby has improved effectiveness and reduced cost. This change is driven by the Clinger-Cohen Act, and more fundamentally by the overall desire of NRC management to identify opportunities for reducing the cost of doing business. Aggressive internal cost improvement activities have reduced NRC operating costs, while still funding needed improved management processes and IT investments.

A number of NRC initiatives have strengthened our management of information technology (IT) and information management. One example is our implementation of a robust Capital Planning and Investment Control process (CPIC), which ensures that NRC IT projects have a strong business case, a demonstrable return on investment, and adequate planning and project management to ensure success. The CPIC process has been used to approve four major IT investments to date: (1) STARFIRE, an integrated resource management system; (2) the NRC Reactor Programs System (RPS); (3) our Agency Documents Access and Management System (ADAMS); and (4) our Personal Computer Refresh system. Three of the four projects are on schedule and on budget. The fourth project, RPS, has identified new requirements due to a business change, and currently is under review for an increased scope and budget.

A second initiative has been the development of an Information Technology Architecture to ensure that IT investments will work together effectively. The NRC has developed a detailed architecture of standards covering not only hardware and telecommunications but also how application systems must work together and share data. We have used this architecture as a framework for studying whether the 13 different types of large-scale computers currently in use could be used more effectively. As a result, we have found a way to move systems so that we can retire an aging and expensive-to-maintain minicomputer. We will continue to use this architecture to ensure the stable operation of the NRC technology infrastructure, and to detect overlap and duplication.

Perhaps the most significant IT initiative is the development of a comprehensive plan for the remediation of all the NRC mission-critical and business-essential systems, to ensure that they will be Year 2000 compliant. [For additional discussion of overall NRC efforts to address the Year 2000 technology problem, see Section V.I.]

NRC Self-Assessment.—Self-assessment plays a critical role in NRC organizational and management effectiveness. Through the PBPM, the NRC has sought to institutionalize self-assessment in our normal agency processes. As discussed throughout this testimony, we are continuing to evaluate and reform our technical

and support functions in order to enhance effectiveness and efficiency. In addition to the reactor inspection, enforcement, performance assessment, and licensing reviews already mentioned, our self-assessments to date have led to the restructuring of our research and rulemaking programs to be more responsive to regulatory priorities, as well as to the closure of the NRC Walnut Creek Field Office in California to achieve process efficiencies. We have been conducting an interoffice assessment of event analysis activities to eliminate overlap and duplication, and we are preparing to issue an Advance Notice of Proposed Rulemaking that would modify event reporting requirements to make them less burdensome and more risk-informed. Our self-assessments of the NRC research program led to its downsizing by approximately 80 percent over the last 17 years, and we will continue to adjust its content and resource levels to reflect changes in the industry and in regulatory need.

The NRC encourages constructive criticism of its actions, and views this as a means for improving the regulatory process. The NRC Office of Nuclear Reactor Regulation (NRR) holds annual Regulatory Information Conferences, during which current and important regulatory issues are discussed openly and candidly with the nuclear power industry and the public. Workshops and other public meetings are held regularly to discuss regulatory developments in an open forum. Public comments invariably are sought on major regulatory actions, and the agency currently is working with the industries it regulates on a broad range of regulatory and technical issues.

As a significant example of soliciting stakeholder inputs in a public forum, the Commission earlier this month hosted a round-table discussion, open to the NRC staff, the industry, Congressional staff, the press, and the general public, to understand more clearly the recent criticisms of various NRC programs, and to invite additional comments and insights from a wide range of participants. The meeting was widely attended, and included participation by the Commission, senior NRC management, industry representatives, the Union of Concerned Scientists, and a former NRC Commissioner. The discussion included a vigorous dissection of various NRC reactor oversight functions and regulatory processes, and was helpful in providing additional insight and perspective on the areas of criticism already discussed.

In addition to these public forums, the Commission has created internal processes to encourage licensees to bring their concerns directly to the attention of NRC management. The NRC staff also solicits more routine feedback from licensees, to gain a broader view of the effect of NRC activities on the safe operation of nuclear power plants. The NRC evaluates this feedback, along with information from other sources (such as the Institute of Nuclear Power Operations (INPO) or NEI), to determine appropriate follow-up actions. The results are tracked and reported annually to the Commission.

To augment our self-assessment capabilities, we recently obtained the services of Arthur Andersen and Company to look at our PBPM process, focusing on how we conduct self-assessments and program and resources planning in reactor-related programs. This study will be ongoing in fiscal year 1999, and will be expanded to include our support functions.

Management and Support Staffing.—In addition to the critical reviews of our program activities, we believe our management and support programs also must be efficient and proportionally sized to our mission functions. Since fiscal year 1994, the NRC has reduced Senior Executive Service managerial positions by 16 percent, from 220 to 185, and we have improved the overall supervisor-to-employee ratio from 1:4 to 1:6 (633 to 402). Reductions in these areas will continue into fiscal year 1999.

NRC Participation in International Activities.—With regard to agency participation in international activities, the international activities in which the NRC participates, and which the NRC funds, do in fact contribute to and are beneficial to the regulation of U.S. nuclear power plants, and are not duplicative of activities performed by other groups. As a simple illustration: when considering the population of nuclear power plants based on or derived from U.S. technology, more are operating outside the United States than inside the United States. To make optimal use of this operational experience database requires access to and interaction with the operators and regulators of these facilities, as well as interactions with organizations such as the World Association of Nuclear Operators (WANO). Such insights provide an important input to NRC regulatory activities, and can directly benefit the U.S. nuclear industry when relevant safety issues are surfaced abroad before they surface in U.S. plants. Moreover, with the decline of our research budget, the NRC must leverage its limited resources to obtain the information necessary to respond to emerging safety issues and to industry initiatives.

While there certainly are lessons to be learned from foreign nuclear organizations, the NRC does not believe it is appropriate to size its organization based on foreign organizations. Differences between the size of the NRC professional staff and that

of other national nuclear regulatory organizations are due to significant institutional, economic, and legal differences. Some foreign governments divide the responsibility for regulation of nuclear-related activities among several different entities, whereas U.S. law provides the NRC with nuclear safety and regulatory responsibilities for a very broad range of nuclear-related activities. [For additional detail on NRC international programs, see Section V.H of this testimony.]

Summary.—In summary, the Commission has made and will continue to make changes to enhance the efficiency and effectiveness of the NRC. To ensure this progress, the Commission will employ its agency-wide Planning, Budgeting and Performance Management process, internal self-assessments, and, as necessary and appropriate, the use of outside consultants. In addition, the NRC will continue to operate in an atmosphere of openness, candor, and a willingness to stimulate feedback and to listen to constructive criticism from its stakeholders.

V. Other Agency Programs and Areas of Focus

A. Electric Utility Deregulation

The economic deregulation of electric utilities has continued its transition from the wholesale to the retail environment. While the Federal Energy Regulatory Commission (FERC) and the State Public Utility Commissions (PUCs) have the responsibility for rate regulation, several areas of NRC focus also have emerged as the transition to a competitive market has begun to take shape. These are not areas of major resource expenditure for the NRC; however, as utilities restructure internally, as ownership arrangements change, as mergers occur, and as licensees work to control and reduce costs, the NRC must understand and respond appropriately to the effects the that changing business environment could have on nuclear safety. NRC areas of focus related to electric utility restructuring fall under four general headings: (1) any impact of cost-competitiveness on safe nuclear operations; (2) electrical grid reliability; (3) the availability of funds for decommissioning; and (4) license transfers and timeliness of NRC reviews. Several specific actions have been taken in this area. The NRC believes that its regulatory framework is generally sufficient, at this time, to address the restructuring and reorganization that likely will arise as a result of electric utility deregulation.

Cost-Competitiveness and Safe Nuclear Operations.—The NRC continues to study possible impacts of cost-competitiveness pressures on safe nuclear operations. NRC safety assessments at some reactor facilities have identified deficiencies that may stem from the economic pressure on a licensee to be a low-cost energy producer, which in turn may limit the resources available for corrective actions and plant maintenance. The NRC is developing measures that could help to identify plants where economic stress may be adversely impacting safety. However, the NRC has not found an overall correlation between cost cutting and a decline in safety performance; rather, in general, the best managed and most cost efficient facilities are those with the best economic and safety performance.

In addition to the potential impact on safe operations, cost-competitiveness could become a factor in nuclear plant license renewal. The impacts here can be complex. In an effort to make nuclear facilities competitive in a deregulated market, in some instances State PUCs have taken steps toward offering limited-time opportunities that would allow utilities to recoup sunk investments in generation. For licensees with a longer-term focus, the financial benefits of license renewal may make the option of continued operation attractive.

Electrical Grid Reliability.—Another important area of NRC focus has been electrical grid reliability. In recent years, NRC probabilistic risk assessments have made it clear that a “Station Blackout” at a nuclear power station is a major contributor to core damage frequency. The term “Station Blackout” is used, in the nuclear power industry, to refer to an event in which a loss of offsite power is coupled with the inability of the onsite emergency diesel generators to provide vital power to plant safety equipment. While the estimated frequency of these events is very low, because of the potential consequences, the possibility of a Station Blackout continues to be an area of NRC focus. The analysis of power reactor experience in this area shows that nuclear generating stations are robust in design and operational standards, allowing them to help stabilize the electrical grid. However, analysis also makes clear that nuclear generating stations are vulnerable to grid disturbances, and especially to loss-of-offsite-power events. Grid reliability governance must take account of these factors. Standards of performance, operational criteria, and training of personnel are oversight issues that all must be addressed as deregulation goes forward. The NRC has established a grid reliability action plan to address concerns regarding the impact of utility deregulation on the reliability of the grid in supplying offsite power to nuclear power plants.

To address related issues, the DOE has created a working advisory committee on the reliability of the U.S. electric system. In July 1997, this committee issued a report to the Secretary of Energy recommending that Federal legislation be considered to clarify the authority and responsibility for setting reliability standards, and that the FERC should review the policy, standards, and governance organization of reliability entities. The committee also has issued two draft reports, one relating to technical transmission issues, and the other addressing the roles and responsibilities of independent system operators. The NRC has been coordinating with the DOE, and will continue to monitor closely the impact of electric utility restructuring on grid reliability. In February 1998, the NRC issued an Information Notice entitled, "Offsite Power Reliability Challenges from Industry Deregulation."

The NRC also has issued a draft report on the evaluation of loss-of-offsite-power events at nuclear power plants for external peer review. This information in this report will be used to evaluate Station Blackout assumptions as they relate to grid reliability. This evaluation is scheduled for completion in fiscal year 1999.

Decommissioning Funding Assurance Existing NRC decommissioning regulations require power reactor licensees either to set aside funds periodically in external trust fund accounts or to provide third-party guarantees for estimated decommissioning costs. As such, by the time a licensee permanently ceases operations at the end of its licensed term, the total amount of funds estimated as needed to complete decommissioning is expected to be available. In the emerging environment of electric utility restructuring, the NRC has had to reevaluate certain aspects of these provisions for decommissioning funding assurance, including the NRC definition of "electric utility," the potential impact of new ownership arrangements, and the problem of above-market or "stranded" costs. Several specific actions have resulted.

On August 19, 1997, the Commission issued a final policy statement on electric utility restructuring and deregulation. The policy statement indicates that the NRC will continue to conduct its financial qualifications, decommissioning funding, and antitrust reviews; will identify all direct and indirect owners of nuclear power plants; will establish and maintain working relationships with rate regulators (including the FERC and the State PUCs); and will reevaluate the adequacy of its regulations in this area.

On September 10, 1997, the NRC issued for public comment a Proposed Rule on decommissioning funding. The NRC staff has developed a final rule that currently is being considered by the Commission. We expect to issue the final rule shortly. As currently written, the rule would modify NRC decommissioning regulations in four areas. First, it would revise NRC regulations to ensure that decommissioning funding assurance requirements are clarified for all responsible licensee entities, not merely for "electric utilities." Second, it would allow credit on the earnings from decommissioning trust funds. Third, to keep the NRC informed of licensee decommissioning fund status, it would require periodic licensee reports on the status of such funds and any changes to licensee external trust agreements. Finally, to ensure adequate licensee accumulation of decommissioning funds, the NRC would take additional action as needed on a case-by-case basis, either independently or in cooperation with the FERC and the State PUCs, including the modification of a licensee schedule for accumulation of decommissioning funds.

The NRC also has taken other actions in this area. NRC staff guidance has been developed for reviews of licensee financial qualifications and decommissioning plans, as well as in the area of antitrust reviews. Numerous meetings have been held with industry representatives, State and Federal rate regulators, the financial community, and other stakeholders. Staff-level liaisons have been established where appropriate. The overall effect of these measures has been to improve NRC, licensee, and public awareness on issues related to electric utility restructuring.

License Transfers and Timeliness of NRC reviews.—The NRC regulation covering power reactor license transfers, 10 CFR 50.80, prohibits the transfer or assignment of a power reactor license, in any manner, without written Commission consent. The NRC evaluates such transfers to determine whether the proposed transferee is technically and financially qualified to conduct the activities covered by the license. The NRC examination of the financial qualifications of the proposed transferee includes three factors: (1) financial qualifications for operations; (2) decommissioning funding assurance; and (3) antitrust considerations. The NRC also must determine whether the transfer would lead to foreign ownership, domination, or control of the facility.

In the past several years, the NRC has seen an increase in transfer applications, primarily as a result of corporate restructuring actions in anticipation of economic deregulation. The restructuring actions that the NRC has evaluated include: (1) mergers, either between electric utilities or between an electric utility and a company outside the power generation industry; (2) formations of holding companies; (3) sales of ownership shares of nuclear plants; and (4) formations of operating subsidi-

aries to run nuclear plants for an owner or owners. With the recent announcement of the sale of Three Mile Island, Unit 1, by GPU Nuclear, Inc. to Amergen, Inc. (a jointly-owned subsidiary of PECO Energy Company and British Energy, Inc.), the NRC likely will be asked to approve the sale of an entire nuclear plant for the first time. The NRC also expects to receive future requests for other types of direct or indirect transfers (e.g., joint ventures).

Because of the variety of current and potential transfer requests, the NRC has evaluated each request based on its particular factual situation. However, the NRC has issued guidance on several aspects of its transfer reviews in the final Standard Review Plan on Antitrust Reviews and the draft Standard Review Plan on Power Reactor Licensee Financial Qualifications and Decommissioning Funding Assurance, which we expect to issue as a final report later this year. The NRC also has developed draft criteria for evaluating license transfers to non-owner operators of nuclear power plants. In addition, the NRC staff has met and remains willing to meet with representatives of licensees and/or intended transferees to discuss requirements of the transfer process.

Notwithstanding our current case-by-case approach, virtually all transfer requests have been completed in a timely fashion. We are not aware of any recent transfer requests in which we have caused any delay of completing the transaction. A "typical" transfer usually can be approved within three to 6 months of receiving the transfer application. NRC approval consists of an order issued by the Director, Office of Nuclear Reactor Regulation, followed by a ministerial license amendment (to add or change names of licensees) if changes to the license are needed. If a conforming amendment to the license is required to reflect administrative changes to the license, such an amendment does not involve a significant hazard consideration. For some facilities, the staff may conduct a significant changes review, in consultation with the Department of Justice, regarding the antitrust implications of the transfer. No hearing on the antitrust aspects of the transfer would be held except in situations in which the NRC finds significant changes. However, 53 of the nuclear reactor units currently licensed to operate have been "grandfathered" and, consequently, are not subject to any NRC antitrust review. The NRC has not had antitrust or other hearings for any of the 45 to 50 transfer applications we have approved in the last 5 years. In view of the fact that NRC antitrust responsibilities tend to duplicate antitrust review responsibilities of other Federal agencies (e.g., the FERC and the Department of Justice), the NRC supports legislation introduced by the Administration to eliminate future NRC antitrust reviews.

B. NRC Certification of Advanced Reactor Designs

In the past 2 years, the NRC has reached significant milestones in the certification of advanced reactor designs, and in the implementation of the associated combined licensing process. As far back as the late 1970's and early 1980's, the experience gained in licensing existing U.S. nuclear power plants indicated that the licensing process for new nuclear power plants could be improved in ways that would enhance safety, improve stability, and reduce industry and agency uncertainty by achieving earlier resolution of technical and policy issues. Taking advantage of this insight, however, proved to be an arduous effort that included legislative reform, a Commission Policy Statement on Standardization, extensive litigation, and rule-making. The overall result has been 10 CFR Part 52, a reformed licensing process that provides for combined licenses, early site permits, and certified standard designs.

In May 1997, the NRC certificated the General Electric Advanced Boiling Water Reactor (GE ABWR) design and the ABB Combustion Engineering System 80+ design. This certification marked the final step in the design certification process, an effort that encompassed both the development and promulgation of Part 52, and that involved the most rigorous technical and safety reviews ever performed for a nuclear plant design. The goals of this process included design standardization, enhanced safety and reliability features, and a more predictable and stable licensing process. Both the ABWR, a 1,350-megawatt boiling water reactor, and the System 80+, a 1,400-megawatt pressurized water reactor, incorporate features that would mitigate the effects of severe accidents.

In addition to these two designs, the NRC is continuing the review process for a third advanced reactor design, the Westinghouse AP600—a 600-megawatt pressurized water reactor that uses passive safety features, employing gravity, natural circulation, convection, evaporation, and condensation for plant protection. The NRC independent AP600 research program played a key role in identifying significant design issues which, if not corrected in time by Westinghouse, would have resulted in significant schedule delays. The NRC research program also helped to resolve issues that were not covered by the vendor test program, and contributed significantly to the overall understanding of the AP600 design.

The NRC staff has continued to devote a significant level of attention and resources toward completing the AP600 review by bringing to closure the remaining technical issues. The NRC staff issued an advanced copy of the AP600 Final Safety Evaluation Report (SER) in May 1998. The Advisory Committee on Reactor Safeguards (ACRS) also made a concerted effort to expedite its review process, which resulted in issuing the ACRS design approval letter earlier this month. The NRC staff expects to be able to release the final AP600 SER next month, with the Final Design Approval to follow in September.

Even given the advantages of these advanced designs, the Commission recognizes that the timing and likelihood of renewed demand for nuclear construction in the U.S. remains unclear. The design certification process, however, has been effective in providing enhancements to safety in design, drawing from experience in a manner that will increase the predictability of the licensing process, and that will ensure NRC readiness for future licensing actions.

C. Status of the Materials Program

Materials Program Initiatives.—The NRC continues to oversee the safe use of radioactive materials by approximately 5,900 specific medical, academic, industrial, and commercial licensees, and an additional 45,000 general licensees. Key areas of improvement include: (1) the implementation of an action plan for improving licensee accountability of licensed materials; (2) the consolidation of NRC guidance for materials licensees; (3) the revision of Part 35, "Medical Use of Byproduct Material"; and (4) the revision of Part 70, "Domestic Licensing of Special Nuclear Material." The NRC also is continuing to improve its effectiveness in relationships with other regulatory entities, such as Agreement States.

The Commission recently approved an action plan to address licensee accountability for certain kinds of licensed materials encompassing approximately 24,000 devices. The action plan was developed in response to recommendations provided by an Agreement State-NRC working group that evaluated current licensee accountability of devices. A registration program would require certain general licensees to register their devices with the NRC annually. This program will ensure that licensees still can maintain accountability of their devices, and will allow the NRC to maintain a database of devices possessed by the licensees.

The NRC is continuing to streamline the process for handling materials license and amendment requests. The NRC staff is midway through the process of updating and consolidating hundreds of guidance documents into approximately 20–30 comprehensive topical reports for use by materials users. These reports will contain licensing checklists and audit guidelines to assist licensees in developing their programs. As a result of these efforts, we expect increased clarity on and understanding of NRC requirements, more completeness in license applications and license amendments, and more timely processing and review of licensee submittals.

The Commission has completed a multi-phase review of its medical use program, which included an independent study conducted by the National Research Council for the National Academy of Sciences' Institute of Medicine. As a result of this detailed review, the Commission directed the NRC staff to develop recommendations for revising the 1979 Commission Medical Policy Statement and 10 CFR Part 35, "Medical Uses of Byproduct Material." The revision of Part 35 would achieve several specific improvements, which would include focusing the regulations on medical procedures that pose the highest radiation safety risk, with a subsequent decrease in the oversight and regulatory burden for low-risk activities. The Commission recently approved a proposed rule for publication and solicitation of public comment. This rulemaking has a targeted completion date of June 1999. The Commission used a process that encouraged and facilitated early State and stakeholder involvement in the development of proposed revisions to Part 35.

The Commission also is pursuing a risk-informed and performance-based approach for regulating fuel cycle facilities. In this context, the NRC currently is revising 10 CFR Part 70, "Domestic Licensing of Special Nuclear Material," to increase NRC confidence in the margin of safety at major fuel cycle facilities. Based on current intentions, this revision: (1) would identify appropriate consequence criteria and the level of protection needed to prevent or mitigate accidents that exceed these criteria; (2) would require affected licensees to perform an integrated safety analysis (ISA) to identify potential accidents at the facility and the items relied on for safety; and (3) would require the implementation of measures to ensure that the items relied on for safety are continuously available and reliable.

In the area of Agreement States, the NRC recognizes its shared responsibility to ensure that the regulatory programs of the NRC and Agreement States collectively establish a coherent nationwide effort in the safe use of nuclear materials. The 30 existing Agreement States regulate approximately 16,000 specific and 90,000 general licensees. The 1997 signing of an agreement between NRC and the Common-

wealth of Massachusetts transferred about 425 materials licensees to Massachusetts regulatory oversight. In addition, Ohio (with about 600 materials licenses) is scheduled to become an Agreement State in fiscal year 1999, and Pennsylvania (with about 800 materials licenses) and Oklahoma (with about 225 materials licenses) currently are scheduled to become Agreement States in fiscal year 2000.

Oversight of the U.S. Enrichment Corporation (USEC).—The NRC issued initial certificates of compliance for both USEC gaseous diffusion plants in November 1996, and assumed regulatory jurisdiction in March 1997. In January 1998, the NRC issued its first annual report to Congress on the gaseous diffusion plants, including an assessment of facility compliance with regulatory requirements. The NRC will conduct the first recertification in fiscal year 1999, in accordance with the USEC Privatization Act, which requires that the NRC recertify the plants at least once every 5 years.

In addition, the NRC has developed a standard review plan, in coordination with other agencies, for NRC activities specifically related to USEC privatization. The NRC staff has used this standard review plan to address NRC review activities required to support USEC privatization. In accordance with the USEC Privatization Act, USEC has begun the privatization process, and expects to become a private entity early in the second half of this year through an initial offering of stock to the public. The NRC will continue to report annually to the Congress on the status of the USEC plants and their compliance with NRC standards, and will continue to undertake an active, comprehensive inspection program to verify operational safety and review of plant incidents and events. This inspection program will continue to include NRC resident inspectors at each plant.

The NRC also is preparing to review an application from USEC for commercial deployment of the Atomic Vapor Laser Isotope Separation (AVLIS) technology, and is engaging in pre-licensing discussions and reviews in support of the USEC application. The USEC has advised the NRC that it plans to submit an AVLIS application in February 1999.

D. High-Level Waste

In the critical area of managing high-level waste, NRC continues to believe that a permanent geologic repository is the appropriate mechanism for the nation to manage, safely and ultimately, spent fuel and other high-level nuclear waste. The Congress has assigned to the NRC significant responsibilities as a part of the national repository program. In accordance with statutory direction in the Nuclear Waste Policy Act of 1982, as amended, and the Energy Policy Act of 1992, the NRC must consult extensively with the DOE before licensing a repository. The 1987 revisions to the Nuclear Waste Policy Act focused DOE high-level waste repository efforts exclusively on the site at Yucca Mountain, Nevada. The NRC has several objectives in this pre-licensing consultation phase: (1) to develop a regulatory framework (regulations and guidance); (2) to ensure that the DOE is aware of the elements comprising a quality license application; (3) to evaluate the adequacy of the site characterization and waste form in the DOE site suitability recommendation to the President; and, (4) ultimately, to determine whether the NRC, through its licensing and oversight processes, can authorize repository construction, receipt of waste, repository operations, and final repository closure and decommissioning.

In order to enhance the effectiveness of the NRC program and in response to budget constraints, the NRC in fiscal year 1996 refocused its high-level waste program on resolution of the ten key technical issues most important to repository safety and, consequently, most important to licensing. These issues cover areas such as groundwater flow, thermal effects, potential disruptive events, container releases, and total system performance. The NRC has continued to make progress toward resolution of these issues, including the documentation of corresponding acceptance criteria and early feedback to the DOE for preparation of its Viability Assessment throughout fiscal year 1996–1998. In restructuring its pre-licensing regulatory program, the Commission has applied a risk-informed and performance-based approach to the performance of a geologic repository system—a system with unique physical characteristics, failure mechanisms, and lifetime. Application of this philosophy has resulted in the development of an integrated regulatory approach under which the key issues important to repository performance and safety will guide the revision of NRC regulations, the development of a Yucca Mountain review plan and independent analytical techniques, and the resolution of issues.

One key technical issue for NRC is the development of a site-specific, performance-based regulation applicable to the proposed repository at Yucca Mountain. Proposed and final regulations are planned for fiscal year 1999 to provide a regulatory framework for the DOE submittal of a license application in 2002. These criteria are being developed to implement health-based standards for Yucca Mountain that are consistent with the recommendations of the National Academy of Science (NAS)

in their 1995 technical report on Yucca Mountain, in accordance with the Energy Policy Act of 1992.

NRC Assessment of DOE Progress and Potential for Licensing Success.—During fiscal year 1999, the NRC will review the DOE Viability Assessment to identify potential licensing vulnerabilities and any major concerns with DOE test plans, design concepts, and Total System Performance Assessment that, if unresolved, could result in an incomplete or unacceptable license application. While the NRC review of the DOE Viability Assessment is not required explicitly under statute, the NRC expects to be asked to provide its independent licensing view as important input to the decisions that the President and the Congress will make concerning the future of the repository program at the Yucca Mountain site. Moreover, the NRC believes that its views, supported by independent NRC analyses, will contribute to public confidence in the credibility of the decision-making process.

The NRC is encouraged that the DOE now is conducting a performance-based program to focus on those issues most important to repository safety. In addition, the DOE recently issued its Repository Safety Strategy (previously called the Waste Isolation and Containment Strategy). This strategy provides the DOE explanation of the role that natural and engineered barriers are expected to play in the containment of radionuclides within the waste package, and in ensuring that the annual dose to persons living near the site is acceptable. The NRC believes that the DOE has made significant progress in its site characterization program for the candidate repository at Yucca Mountain, including the completion of the Exploratory Studies Facility, the recent initiation of the East-West Drift for the enhanced characterization of the repository block, and the surface-based and subsurface testing.

On the basis of what is known today, the NRC is confident that it will be able to determine, with reasonable assurance, whether spent fuel and other high-level waste can be disposed of safely in a geologic repository at Yucca Mountain, provided that: (1) the NRC receives a high-quality license application from the DOE; (2) NRC requirements are met; (3) the NRC is permitted to maintain its technical capability for licensing a geologic repository in the face of budget constraints, and (4) timely, reasonable, and implementable standards are developed for the repository. Ensuring that the NRC is prepared to review a DOE license application for a geologic repository in a timely manner is a Commission priority. To this end, a credible, technically competent, and adequately funded pre-licensing regulatory program is essential.

Potential Issues.—The Commission is continuing to work with the DOE, the Office of Management and Budget (OMB), the Office of Science and Technology Policy (OSTP), and the Environmental Protection Agency (EPA), to ensure that the EPA high-level radioactive waste standard, when issued, is both appropriate and implementable. However, many issues related to the EPA high-level waste standard are similar to those related to the NRC cleanup rule for sites undergoing decommissioning. As a result, the NRC recently wrote to the Senate Committee on Environment and Public Works, suggesting that a legislative solution may be necessary.

The Commission also is aware that the Congress is contemplating new legislation that would alter the national high-level waste program. The Commission agrees with the basic approach taken in both the House and Senate bills, including the use of an all-pathways radiation standard, and believes that both contain the fundamental elements of an integrated waste management system needed for the protection of public health and safety. That being said, however, the Commission recommends that the Congress take particular care that the overall schedule for DOE acceptance of waste for storage at a licensed interim storage facility and its obligation to submit a license application for a permanent repository do not set these two important programs on a collision course with respect to their needs for limited resources. Centralized interim storage and permanent geologic disposal are key elements of the integrated waste management systems laid out in both bills. The development and licensing of each should be afforded sufficient time and adequate funding.

Status of Spent Fuel Storage.—Currently, it is primarily the responsibility of licensed utilities to manage the spent fuel from commercial nuclear power reactors. The NRC reviews the designs for and operation of facilities for the storage of spent fuel in fuel pools and independent spent fuel storage installations, primarily located at reactor sites. The NRC has certified 13 cask designs for spent fuel storage under the use of either a general license or as part of a site-specific license—and has certified two cask designs to be fabricated for the transport of spent fuel. In fiscal year 1999, the NRC anticipates reviewing approximately 50 applications for commercial spent fuel transport designs, Department of Transportation and DOE spent fuel transport designs, commercial spent fuel storage designs, and interim storage of spent fuel, including ten independent spent fuel storage installations (ISFSIs), one of which would be a privately owned, away-from-reactor interim spent fuel storage facility. Associated review and inspection activities will ensure that safety and regu-

latory compliance are achieved and maintained for these designs and installations. Additionally, the NRC will continue its review of a spent fuel dry transfer system, which would allow cask-to-cask transfers and would, among other features, obviate the need for using a spent fuel pool in conducting a transfer, which would facilitate timely and safe decommissioning of shutdown commercial power reactors.

E. Decommissioning and Decontamination; Clean-Up

Decommissioning involves removing radioactive contamination in buildings, equipment, groundwater, and soils to such levels that a facility can be released for either unrestricted or restricted use. In addition to the cleanup of hundreds of facilities each year, the NRC is continuing to encourage timely cleanup of approximately 40 more complex material and fuel cycle facility sites through the implementation of its Site Decommissioning Management Plan. Five sites were successfully decommissioned and removed from the Site Decommissioning Management Plan list in fiscal year 1997. The NRC expects three more sites to be removed each year in fiscal year 1998 and fiscal year 1999. In addition, decommissioning was completed and the operating license terminated for the Fort St. Vrain Nuclear Generating Station, Unit 1, owned by the Public Service Company of Colorado. Except for the independent spent fuel storage installation, the site was released for unrestricted use.

After an extensive rulemaking process that involved several years of enhanced stakeholder interaction through workshops and public meetings, the Commission in July 1997 issued a final rule to establish radiological criteria for decommissioning and license termination. The NRC rule contains an all-pathways radiation standard that is consistent with recommendations of national and international scientific organizations. The NRC use of an all-pathways standard is also consistent with the all-pathways approach reflected in the high-level waste bills currently under Congressional consideration. During earlier discussions, the staff of the U.S. Environmental Protection Agency (EPA) had expressed concern with certain provisions of the rule, including the lack of a separate groundwater standard. As a result, the NRC and the EPA held a public meeting in April 1997, after which the NRC revised its proposed final rule on two issues in response to EPA concerns. However, it should be noted that the NRC fundamentally disagrees with the need for a separate groundwater standard. Before finalization of the rule, I met with the EPA Deputy Administrator, on behalf of the Commission, to review the rule and to discuss how the views and concerns that the EPA had expressed might be accommodated in individual license termination requests from licensees. In addition, we discussed the possibility of developing some type of binding agreement on the finality of NRC license termination decisions.

In August 1997, I sent to Administrator Browner a draft Memorandum of Understanding (MOU) entitled "Consultation and Finality on Decommissioning and Decontamination of Contaminated Sites." This draft MOU identifies the responsibilities of each agency for the decommissioning and decontamination of contaminated sites, and specifies the ways in which these responsibilities would be carried out to achieve finality in license termination decisions. Later in August, we received a copy of EPA guidance entitled "Establishment of Cleanup Levels for CERCLA Sites with Radioactive Contamination." This document provides clarifying EPA guidance for establishing protective cleanup levels for radioactive contamination at sites that come under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA). We were disappointed to see in this guidance the EPA assertion that the dose limits in the NRC final rule generally will not provide a protective basis for establishing preliminary remediation goals for cleanup at CERCLA sites, and that the NRC sites would require further remediation. A principal NRC concern with this guidance and the EPA position is the question of finality for sites that have complied with the NRC or equivalent Agreement State cleanup standards and have had their licenses terminated. To address this concern, the Commission proposed legislation that would amend CERCLA to recognize NRC cleanup standards as sufficiently protective, and that would provide finality to sites that have complied with the NRC or equivalent Agreement State cleanup standards.

In December 1997, I sent a letter to Administrator Browner detailing NRC concerns and comments on the EPA CERCLA guidance. The EPA responded to the NRC-proposed MOU on February 19, 1998, and to NRC comments on the CERCLA guidance on February 20. In reviewing these responses, the Commission found that the EPA was continuing to oppose finality for sites that comply with NRC cleanup standards. Therefore, in April 1998, I again wrote to Administrator Browner, stating that there appear to be fundamental differences between the NRC and the EPA on the basis for protecting public health and safety and the environment, and that the Commission continues to believe, consistent with standards of the international community, that the regulatory approach used by the NRC will be sufficient to ensure adequate protection of public health and safety and the environment in this

area. I also stated that the Commission recognizes that the resolution of the differences between our agencies is a matter of policy that can best be solved by Congressional action. Subsequently, Administrator Browner categorically rejected the NRC legislative approach, and informed me that if an agreement satisfactory to both agencies cannot be developed, the EPA may decide to apply its standards unilaterally and require remediation under CERCLA for NRC sites after they have been decommissioned.

In summary, the NRC supports legislation that would establish finality for sites that comply with NRC cleanup standards. Dual regulation is wasteful of both government resources and the resources of American citizens to whom the regulations apply. Therefore, the Commission supports language comparable to that found in section 810 of H.R. 3000. This provision would effectively prevent later imposition of additional remediation standards or requirements at decommissioned sites that have met the NRC cleanup standards.

F. Work with the U.S. Department of Energy (DOE)

Several areas of change for the NRC involve work with the Department of Energy (DOE). We are positioning the NRC to become, potentially, the external regulator of DOE nuclear activities, and to license DOE privatized facilities. On the basis of a DOE/NRC memorandum of understanding (MOU), a pilot program for the regulation of DOE nuclear facilities has begun. In addition, as part of plans to stabilize the Hanford tank waste through a remediation project, the DOE is proposing to privatize the operation, and to have the NRC license the private enterprise. The NRC has been providing technical assistance and support for this project, including reviews of contractor proposals and the development of a regulatory program, to ensure a smooth transition later in the project for NRC regulatory oversight. We also have approved a license amendment authorizing the irradiation of tritium-producing lead test assemblies at Watts Bar Unit 1, and we will continue to work with the DOE on the use of a commercial light-water reactor for tritium production, if the Congress and the Administration support this approach. Finally, we have begun discussions with the DOE regarding NRC involvement in either of two DOE strategies for disposal of excess weapons-grade plutonium: (1) immobilizing surplus plutonium with high-level waste in ceramic material for geologic disposal, and (2) burning surplus plutonium as a component of mixed-oxide fuel in existing commercial reactors.

External Regulation of DOE.—In December 1996, following a report by a DOE Advisory Committee on External Regulation and further study by a DOE working group, the Secretary of Energy announced that the Administration would take certain measures toward giving the NRC the responsibility for the regulation of nuclear safety at nearly all DOE nuclear facilities, phased in over a 10-year period. The Advisory Committee and the working group had concluded that external regulation of DOE nuclear safety would increase the assurance of safety, give the public and workers more confidence in the safety of DOE operations, make safety regulation of DOE nuclear facilities more stable, require operations managers to be more accountable for nuclear safety, and minimize redundancy in the safety regulation of DOE nuclear facilities. The NRC evaluation of this concept was part of the NRC Strategic Assessment and Rebaselining initiative. In the course of that evaluation, public comments overwhelmingly favored NRC regulation of DOE nuclear facilities. These two factors—the DOE decision and the public commentary—weighed heavily in the Commission decision to endorse NRC oversight of DOE facilities. In June 1997, the DOE and the NRC agreed to pursue NRC regulation of DOE nuclear facilities on a pilot program basis.

The pilot program is to determine the feasibility of NRC regulatory oversight of DOE nuclear facilities, and to support a decision on whether to seek legislation to authorize NRC regulation of DOE nuclear facilities. On November 21, 1997, DOE Secretary Pena and I (on behalf of the Commission) signed a Memorandum of Understanding (MOU) between the NRC and the DOE that details the specific conditions and activities associated with the pilot program. The MOU objectives include: (1) determining the value added by NRC regulatory oversight; (2) testing various regulatory approaches (for example, licensing and certification); (3) determining the status of DOE pilot facilities with respect to meeting existing NRC requirements, or acceptable alternatives, and identifying any significant safety issues; (4) determining the costs (to both agencies) of NRC regulation; (5) evaluating alternative regulatory relationships, and determining DOE contract changes that might be necessary to provide for NRC oversight; (6) identifying transition issues and solutions; (7) identifying legislative and regulatory changes needed; and (8) evaluating appropriate processes for stakeholder involvement should the NRC assume broad external regulatory authority over DOE nuclear facilities.

The pilot program began in the Fall of 1997 at Lawrence Berkeley National Laboratory (LBNL). On-site work for the Lawrence Berkeley National Laboratory pilot

was completed on January 15, 1998. No significant safety issues were identified at LBNL. After completing the Berkeley site report, the Commission has requested that the NRC staff prepare a revised MOU, in consultation with the DOE, that would incorporate lessons learned during the process and, if agreed, allow the agencies to recommend jointly that the Administration seek legislation promptly for NRC regulatory authority for a specific pilot facility or class of facilities, on the basis of information gained during a specific pilot.

The field work on the second pilot site, the Radiochemical Engineering Development Center (REDC) at Oak Ridge National Laboratory, was completed in June 1998. The tentative conclusions of the work to date are that REDC as well as LBNL are licensable without significant changes to the facilities or their radiation safety programs. However, several major policy issues have resurfaced recently that could delay completing both reports. These issues are: (1) Who should be the licensee (i.e., the DOE or the contractor)? (2) What, if anything, should be done about legacy materials and buildings? and (3) Should the NRC seek jurisdiction over DOE accelerators and over DOE naturally-occurring and accelerator-produced radioactive materials? The NRC and the DOE are working together to resolve their differences on these policy issues.

The third pilot for fiscal year 1998 is underway at the Savannah River Site Receiving Basin for Offsite Fuels, and is scheduled for completion in late 1998. During fiscal year 1999, the NRC intends to continue the pilot program, starting with the Pacific Northwest National Laboratory and adding facilities of greater complexity that would provide expanded information on the major objectives previously outlined. In addition, the NRC staff has begun work on draft legislation that would support NRC oversight of specific facilities.

Current DOE Privatization Activities.—The NRC also is participating in the DOE Hanford tank waste remediation system project, a major privatization initiative, located on the Hanford Reservation in Richland, Washington. An NRC/DOE MOU was executed on January 29, 1997, specifically for the demonstration phase (Phase I) of this project. This MOU calls for the NRC to provide technical assistance and support to the DOE in the development of a comprehensive regulatory program, consistent with the NRC regulatory approach, for processing all Hanford tank wastes into forms suitable for final disposal, while protecting the general public, workers, and the environment. The Congress continued to appropriate funding for NRC participation in this project for fiscal year 1998. To support this phase, the NRC has established a permanent on-site representative on the Hanford site, and continues to assist in the review of initial DOE privatization contractor submittals, as well as in the DOE development of guidance documents for the privatization contractors. Throughout Phase I of this program, the DOE is responsible for regulating the activities of the privatization contractors. However, the ultimate goal of NRC participation is to provide a smooth transition into the DOE-proposed NRC licensing of the privatized contractor. Legislation may be necessary to clarify NRC authority to regulate these activities.

Tritium Production.—The evaluation of options for tritium production is another DOE activity that the NRC is supporting. The United States stopped producing tritium in 1988, when the last nuclear weapons production reactor at the DOE Savannah River site was shut down. The most recent projection calls for resumption of tritium production by the end of 2005. To meet this need, the DOE has chosen a dual-path strategy involving the evaluation of the two most promising tritium supply alternatives: (1) to produce tritium in commercial light-water reactors, either through acquisition of reactors under government ownership, or by contracting for target irradiation services under private ownership; and (2) to design, build, and test critical components of an accelerator system for tritium production. It is our understanding that the DOE plans to select one of these approaches by the end of 1998 to serve as the primary source of tritium. The other alternative, if feasible, will continue to be developed as a backup tritium source.¹¹ The commercial reactor option has been split into two phases. The first phase, a demonstration phase currently under way at the Tennessee Valley Authority's Watts Bar Unit 1 nuclear plant, involves the irradiation of 32 tritium-producing burnable absorber rods (referred to as a "lead test assembly"). These rods were placed in the Watts Bar reactor core during the first refueling outage (in the Fall of 1997), following issuance of a license amendment by the NRC. The rods are scheduled to be removed from the core during the Spring 1999 outage and shipped to a DOE facility for post-irradiation examination. We understand that this tritium will not be used for defense purposes. Consistent with Administration and Congressional decisions and guidance, the second phase of the commercial reactor option is the irradiation of up to about 3300 rods in a tritium production core. The DOE expects to submit its tritium production core topical report for NRC review later this summer. Assuming any necessary legisla-

tive and programmatic approvals are in place, and the DOE proceeds with its program, a plant-specific application for an amendment to the facility operating license is expected in 1999 or 2000. Under such a scenario, licensees undertaking tritium production core irradiation would need NRC authorization in 2002 or 2003 in order to meet the DOE requirement for extraction of tritium gas by the end of 2005.

Disposition of Surplus Weapons-Grade Plutonium.—Under a reimbursable agreement signed by the NRC and the DOE in September 1995, the NRC agreed to provide assistance to the DOE Office of Fissile Materials Disposition in the review of potential disposition alternatives for plutonium declared excess to the needs of the U.S. nuclear weapons program. In January 1997, the DOE issued its Record of Decision that reflected a dual strategy for plutonium disposition: (1) immobilization of some of the surplus plutonium in ceramic material, after mixing with high-level waste, for disposal in a geologic repository; and (2) burning of some plutonium as a component of mixed-oxide (MOX) fuel in existing commercial reactors. With respect to the MOX fuel strategy, the DOE indicated that it anticipates that the MOX fuel fabrication facility would be licensed by the NRC at a DOE-owned facility, and that the MOX fuel would be irradiated in a commercial power reactor. The DOE has announced that its Savannah River site would be the location of the MOX fuel fabrication facility. The referenced reimbursable agreement was modified to cover the NRC costs of NRC assistance in preparing for eventual licensing activities.

We also are reviewing a number of issues that may require legislation, related to the roles of the NRC and the DOE in the MOX fuel program. Some of these issues include: (1) whether such a facility should be regulated by a licensing or a certificate-of-compliance approach; (2) whether the DOE or a contractor (or both) would be the regulated entity; (3) the role of other Federal agencies; (4) the role of the Defense Nuclear Facilities Safety Board; (5) who should be responsible for certain activities related to the MOX fuel facility, such as physical protection, MOX fuel transportation safety, low-level radioactive waste disposal, liability coverage, and facility decommissioning; and (6) whether the MOX fuel program and facility would or would not be considered a "defense activity or facility" under 42 U.S.C. 7272.

G. Significant Research Activities

To make timely and technically credible regulatory judgements and to anticipate problems of potential safety significance, the NRC must have independent technical expertise and information. Key to providing this capability is the NRC research program. This program is both confirmatory and anticipatory, and resolves uncertainties associated with the most safety significant regulatory issues. The NRC conducts reactor and plant performance research to provide in-depth examination and understanding in support of other regulatory functions. For example, the recent rebaselining of the reactor source term, under the NRC research program, will facilitate the approval of utility requests for changes to some operational limits. Current areas of significant research emphasis include high burnup fuel behavior, reactor pressure vessel integrity, steam generator research, environmentally assisted cracking, radionuclide transport, thermal-hydraulic research, severe accident research, probabilistic risk assessment, and environmental qualification of electrical cables.

The NRC routinely seeks opportunities in its relationships with outside organizations, both domestic and foreign, to enter into cooperative research agreements through which it can leverage available research resources. These organizations include other Federal agencies, the Electric Power Research Institute (which conducts research for the U.S. industry), and members of the international regulatory community engaged in nuclear safety research. These agreements result in both the sharing of information and the sharing of research costs, the effect of which is to maximize the use of our research resources, and at the same time to enhance our own research capabilities.

By maintaining a viable research program, the NRC has access to research through approximately 35 active cooperative agreements, as well as through another 45 agreements that are being extended or considered with organizations in more than 25 countries, including countries from the former Soviet Union. Through these agreements, the NRC contributes about \$8 million annually, but receives the benefits of research valued at approximately \$85 million annually. In addition, the NRC receives about \$1.3 million each year in support of its various research programs.

A good example of NRC cooperative efforts and leveraging of research resources is the joint U.S.-Russian research program on radiation health effects, which is being performed under the auspices of the U.S.-Russian Joint Coordinating Committee on Radiation Effects Research (JCCRER). While the studies can involve both U.S. and Russian populations, the initial focus is on the unique opportunities in the southern Urals in Russia, particularly in the vicinity of the Mayak nuclear complex. There, as a result of past poor operating practices and accidents, workers and the

surrounding populations were exposed to significant amounts of radiation. The characteristics of these exposures are different in many respects from those for populations previously studied for radiation health effects, such as the survivors of Hiroshima and Nagasaki.

Present radiation protection standards have been developed by making assumptions on how to extrapolate the risks of deleterious health effects from those observed in populations exposed to short bursts of radiation (such as the atomic bomb survivors) to the chronic exposures that are characteristic in facilities subject to NRC regulation. The studies in the southern Urals will contribute to a better understanding of what models are most appropriate to describe the relationship between low dose rate (chronic) radiation exposures and radiation-induced health effects.

The DOE is the U.S. executive agency for the JCCRER, and the NRC is sponsoring a portion of the research. Other Federal agencies participating in the JCCRER are the EPA, NASA, and DOD.

H. International Cooperation

Bilateral and Multilateral Activities.—The NRC has long maintained a wide-ranging program of international cooperative exchanges to ensure the peaceful, safe, and environmentally acceptable uses of nuclear energy in the United States and abroad. This cooperation is conducted through a variety of bilateral and multilateral relationships. As the regulator of the world's largest civilian nuclear program, the NRC has broad capabilities to contribute to international programs on nuclear power safety, radiation protection, nuclear material protection control and accounting, waste management, and decommissioning of nuclear facilities. At the same time, the Commission can benefit from the experience and expertise gained by foreign nuclear operations.

In supporting U.S. non-proliferation objectives, the NRC is working with the Executive Branch to facilitate the effective implementation of the Strengthened Safeguards System of the International Atomic Energy Agency (IAEA). The NRC will participate with other involved agencies in the preparations for implementation of the Additional Protocol to the US/IAEA Safeguards Agreement. Subsequently, the Protocol provisions will be implemented at applicable NRC licensed facilities.

Currently, the NRC is involved in 33 bilateral safety arrangements with other countries on five continents. These relationships provide the framework for providing technical advice and assistance to other countries, as well as for exchanging significant safety and research information.

Convention on Nuclear Safety.—The NRC has worked extensively in the development of the International Convention on Nuclear Safety—the first instrument to address directly the safety of nuclear power plants worldwide. This convention obliges contracting parties to establish and maintain proper legislative and regulatory frameworks to govern safety. The Convention on Nuclear Safety has been transmitted to the U.S. Senate for review and action during the current session.

I. Year 2000 Systems Corrections

As a preliminary comment in this area, I would note that on June 12, 1998, I testified on the subject of Year 2000 Readiness of the Utility Industry before the Senate Special Committee on the Year 2000 Technology Problem. In addition, on May 14, 1998, NRC management testified on Year 2000 issues before the Subcommittee on Technology, House Science Committee.

The NRC continues to leverage information technology to provide the capacity needed to manage effectively the regulatory, scientific, administrative, financial, and records data that are vital to fulfillment of the NRC mission. The NRC is fully aware of the challenges we face in ensuring that our computer applications and hardware systems continue to function properly in the year 2000 and beyond, and we have established an aggressive program to address those challenges directly. We estimate that the total cost to the NRC will be \$10.9 million.

The NRC has completed its assessment of the scope of the Year 2000 computer problem as it relates to computer systems that we use directly. We also are communicating with agencies with which we exchange electronic information, to ensure that our data exchange formats will properly represent dates beyond 1999. The NRC has developed an action plan and schedules to ensure that the systems most vital to NRC operations are repaired well before the year 2000, with appropriate repair schedules for systems less critical to mission-related activities. The NRC is pursuing aggressively the certification of Year 2000 compliancy for products and services that we acquire or use from commercial sources. The NRC Year 2000 program is in compliance with the most current Year 2000 program guidance issued by the Office of Management and Budget.

The NRC also is fully aware of the need to address the Year 2000 computer problem in relation to the use of computers in the nuclear industry. To ensure proper focus on this issue by the nuclear power industry, the NRC staff met with the Nu-

clear Energy Institute (NEI) to obtain industry support in addressing the concern. NEI has agreed to initiate an effort on the Year 2000 computer problem and, working jointly with the Nuclear Utilities Software Management Group, has promulgated a guidance document to assist nuclear power plant licensees in developing programs to address this issue effectively. This document, entitled "Nuclear Utility Year 2000 Readiness," has been issued to all nuclear power plant licensees, and a related workshop was conducted in November 1997. NEI also met with utility senior executives in November to remind them of the importance of addressing the Year 2000 computer problem at their facilities, and to establish a mechanism for exchange of information among licensees as they implement their programs.

In December 1997, the NRC developed a draft generic letter, entitled "Year 2000 Readiness of Computer Systems at Nuclear Power Plants," to ensure that licensees provide assurance of this readiness. As part of the Federal Register notice soliciting public comment, the NRC requested proposed alternatives to the generic letter, such as a voluntary industry initiative that would satisfy the same intent. The NRC staff has met with the staff of the General Accounting Office (GAO), and factored GAO comments into the final generic letter. The final generic letter was issued to nuclear power plant licensees on May 11, 1998. The generic letter requires licensees to confirm, within 90 days of the date of the letter, that they are pursuing a program to address the Year 2000 problem, and, by July 1, 1999, to confirm that they will be Year 2000 ready or to provide the schedule for remaining actions to achieve readiness. In addition to requiring licensees to report on the existence of Year 2000 programs and to confirm their readiness, the NRC has recommended that licensees establish contingency plans. The NRC will conduct inspections of approximately 12 nuclear power plant licensee Year 2000 programs, on a sample basis, during 1998 and 1999. In addition, the NRC will continue to monitor licensee efforts to address the Year 2000 computer problem through attendance at related workshops and meetings over the next 2 years. We believe that our timetables have been established prudently, allowing consideration of the need to issue shutdown orders (in the unlikely event that a reasonable assurance of safety cannot be concluded) well before the end of 1999, thus allowing for contingency planning on the part of affected utilities.

Over the past year, the NRC has taken a number of actions to ensure that the Year 2000 computer problem will be either eliminated or minimized for its materials licensees as well. We have sent our materials licensees two Information Notices on this problem, as well as conducting on-site and telephone sampling interviews with management from various types of NRC materials licensees. Interviews were conducted with gauge manufacturers, teletherapy device manufactures, fuel cycle organizations, uranium extraction companies, broad-scope medical institutions, and the US Enrichment Corporation gaseous diffusion plants, to identify any additional problems or issues that warranted further action. NRC materials licensee inspectors have been instructed to confirm licensee receipt of NRC Information Notices, to determine whether licensees have identified any potential problems, and to note any corrective actions taken.

RESPONSES BY THE COMMISSIONERS OF THE NUCLEAR REGULATORY COMMISSION TO
ADDITIONAL QUESTIONS FROM SENATOR INHOFE

Question 1. What is the NRC's plan for continued oversight and inspection at Millstone Unit 3 to ensure safe operation of the plant?

Response. Millstone Unit 3 is on the NRC watchlist as a Category 2 plant, which ensures that it receives increased NRC management oversight until such time as plant performance dictates that a category change is called for. Region I has the responsibility for management oversight and inspection and has assigned a senior NRC manager and staff to implement the inspection program to assure the safe operation of the plant. In addition, the Millstone Restart Assessment Panel, which is comprised of regional and headquarters managers, senior residents, and project managers, will continue, for the foreseeable future, to meet periodically with the licensee, assess Unit 3 performance, and provide input to the inspection program.

Question 2. What is the NRC's plan to ensure that Millstone 2 does not reopen until restart is safe?

Response. Millstone Unit 2 continues to remain shut down pending the licensee's completion of its corrective actions and NRC's verification and formal authorization to restart. The licensee has implemented a Configuration Management Plan (CMP) for Unit 2 as its principal program to provide reasonable assurance that design-bases weaknesses have been effectively corrected. COP includes both efforts to un-

derstand the licensing- and design-bases issues and actions to prevent recurrence of those issues. Before NRC can reach a decision to approve restart for Unit 2, the licensee must determine that the plant conforms with applicable NRC regulations, licensing conditions, the Updated Final Safety Analysis Report (UFSAR), and that applicable licensing commitments have been met. NRC must then agree with that determination.

As a result of the NRC issuing a confirmatory order on August 14, 1996, the licensee was directed to contract with a third party to implement an Independent Corrective Action Verification Program (ICAVP) to verify the adequacy of its efforts to establish adequate design bases and design controls. The ICAVP is intended to provide additional assurance, before unit restart, that the licensee has identified and corrected existing problems in the design and configuration control processes. Because of the scope and depth of the corrective actions for Millstone, the date for restart of the Millstone Unit 2 has not been established. NRC's program for assessing the corrective actions at Millstone will continue to focus on a thorough examination of the issues identified in the NRC staff's restart assessment plan.

In SECY-97-003, "Millstone Restart Review Process," dated January 3, 1997, the staff provided to the Commission the NRC staff's processes and approaches that will be used to oversee the corrective action programs at the Millstone Nuclear Power Station. The staff is applying the guidelines of NRC Manual Chapter (MC) 0350, "Staff Guidelines for Restart Approval," to the restart approval of Millstone Unit 2. The NRC restart actions plan for Unit 2 consists of several major elements, including corrective action programs, work planning and control improvements, procedure upgrade programs, quality assurance and management oversight improvements, and completion of ICAVP.

Question 3. The GAO report included a recommendation that inspection reports fully document the status of the licensee's actions to address identified problems under NRC corrective action requirements.

(a) What has the NRC done to respond to this recommendation?

Response. The NRC acknowledged the GAO recommendation and on August 18, 1997 provided following response:

The NRC agrees with the recommendation to improve oversight of licensees' timely resolution of problems. The staff has long recognized the importance of the licensee's corrective actions and has several processes that focus inspection effort and licensee's management attention on this area, as described below:

NRC inspectors currently review the adequacy and timeliness of corrective actions taken by the licensees in response to violations of NRC requirements and deviations from licensing commitments. They document these reviews in inspection reports, which are public documents. These violations and deviations result from nonconformances identified during NRC inspections of the facility or by the licensee's own problem identification process.

NRC inspectors routinely monitor, review, and verify the adequacy of licensee corrective actions. Since licensees annually identify thousands of deficiencies, NRC resource limitations demand that these inspections are performed on a selective basis, focusing on those issues that are most risk- and safety-significant.

In addition, the NRC reviews the licensee's corrective action program at each reactor facility on a periodic basis (Inspection Procedure 40500, "Effectiveness of Licensee Controls in Identifying, Resolving, and Preventing Problems") to verify that the licensee is implementing an adequate program.

NRC's enforcement policy specifies appropriate enforcement actions for nonconformances with planned and required corrective actions. Additionally, to encourage licensees to identify and resolve problems, the enforcement policy provides for mitigation of the sanction for timely identification and appropriate corrective actions by the licensee.

Problems identified at the Millstone and Salem plants related to the licensees failure to take prompt corrective action, as noted in the GAO report, indicate this area warrants greater attention from the NRC. The staff has begun a review of its internal processes to identify areas for improvement in assessing the timeliness, prioritization, engineering support, and quality of the corrective actions taken by licensees. Some areas included in the staff's review are the plant performance review, and the senior management meeting (SMM) processes. The agency is strengthening its processes for assessing the effectiveness of a licensee's corrective action program by focusing on what a licensee has done as opposed to what it plans to do. In that regard, the NRC intends to provide additional guidance on how inspectors should close out issues identified in NRC inspection reports. The staff is also developing a process to better identify and track licensing commitments and to verify their implementation.

While the NRC intends to follow more closely the corrective actions for issues included in inspection reports, the NRC does not agree with the specific recommendation to track and document in the inspection reports the status of corrective actions for all licensee-identified issues. Criterion XVI of 10 CFR Part 50, Appendix B, requires licensees to promptly identify and correct failures, malfunctions, deficiencies, deviations, defective material and equipment, and nonconformances. Given the number of issues identified, the efforts required by the NRC to document and track deficiencies regardless of safety significance, as recommended in the GAO report, would be large and without a commensurate safety benefit.

Based on our response dated August 18, 1997 to the GAO report, NRR prepared draft inspection procedure changes to provide additional guidance on how inspectors should close out issues (severity level IV violations, open and unresolved items) identified in NRC inspection reports. However, because of the recent changes being proposed to the enforcement program which may require no additional NRC review of less risk significant severity level IV violations as long as these issues are captured in the licensee's corrective action program, NRR has postponed implementing the draft procedures. Once the Office of Enforcement's review of how severity level IV violations should be processed by the Agency is completed, NRR will integrate the OE's recommendations into the NRR's guidance on how to close out open issues so that the OE's and NRR's processes are consistent.

Question 3. NRC's role in future nuclear energy development vis-a-vis DOE. (b) Include detailed plans and schedules for the NRC review of the Calvert Cliffs license renewal and the transfer of ownership of TMI Unit 1.

Response. The technical review plan for the Calvert Cliffs renewal application was forwarded to Baltimore Gas & Electric in a letter dated June 17, 1998. The milestones in the Calvert Cliffs schedule are as follows:

Calvert Cliffs Renewal Milestone	Date
Receive Renewal Application	4/10/98
Notice Application Tendered	4/25/98
Complete Acceptance & Docketing	5/10/98
Public Meeting & Environmental Impact Statement (EIS) Scoping	7/9/98
Staff Complete Technical Requests for Additional Information (RAIs)	9/7/98
Staff Complete Environmental RAIs	10/7/98
Applicant Complete Technical RAI Responses	11/21/98
Applicant Complete Response to Environmental RAIs	12/6/98
Issue Draft Environmental Statement (DES) for Comment	3/6/99
Staff Complete Safety Evaluation Report (SER) and Identify Open Items	3/21/99
Public Meeting to Discuss DES	4/5/99
Complete DES Comments	5/20/99
Applicant Complete Response to Open Items	7/19/99
Staff Issue Supplemental SER & Final Environmental Statement (FES)	11/16/99
ACRS Recommendations to Commission on Application	2/14/00
Commission Decision on Application	before 10/00

On July 8, 1998, a Notice of Opportunity for Hearing was published in the Federal Register related to the renewal application for Calvert Cliffs. As of August 10, 1998, one petition for leave to intervene has been received in connection with the Calvert Cliffs renewal application.

The Commission may issue a case-specific order providing further guidance on procedures and scheduling matters.

The NRC also received a license renewal application on July 7, 1998 from Duke Energy Corporation for their three-unit Oconee plant. The staff established similar milestones for the review of the second renewal application, which were forwarded to Duke in a letter dated July 31, 1998.

Both renewal reviews are proceeding as scheduled. NRC management and the NRC License Renewal Steering Committee will meet with BGE and Duke management on August 20, 1998, to discuss the plans and progress on the renewal reviews.

The NRC has not yet received a request from Amergen (a consortium formed by PECO Energy, Inc., and British Energy) to transfer ownership and operating authority of the Three Mile Island, Unit 1, plant. Among other matters, the issue of foreign ownership, domination, or control will have to be addressed in light of the prohibition in the Atomic Energy Act of 1954, as amended, against such interests. Given the unknowns, the NRC has established the following schedule, expressed in

terms of weeks following receipt of an application, for review of the license transfer request, including a provision for an adjudicatory process, associated with the purchase of Three Mile Island, Unit 1 (TMI-1) by Amergen, Inc.:

Milestone	*Weeks
Complete Acceptance Review; publish Notice of Application and Opportunity for Hearing in Federal Register and identify case-specific schedule factors.	2
Complete preparation and submittal of Commission paper on analysis of policy and legal issues associated with foreign ownership, domination, or control of TMI-1.	8
Complete reviews of decommissioning funding assurance, financial qualifications, technical qualifications, foreign ownership, and antitrust. (Note that the license for TMI-1 was issued under Section 104b of the AEA. As such, the facility and its licensees are "grandfathered" from antitrust reviews.) Issue order (and associated license amendment) approving or disapproving license transfer. If required, also issue Environmental Assessment and Finding of No Significant Impact. (Note that the Commission has determined that any hearing that might be granted in connection with a transfer order need not be completed before the issuance of such order. Pursuant to 10 CFR 50.92, the conforming amendment to the license does not typically involve a significant hazard consideration and may take effect upon issuance. However, the order and any conforming amendment are subject to the outcome of any hearing that may be conducted in connection with the transfer application.)	12
Complete hearing process, if required.	**36

*Cumulative weeks following receipt of an application for transfer of ownership

** The estimated duration of any hearing that might be held is based upon the Commission's currently applicable Rules of Practice and the recently issued Statement of Policy on Conduct of Adjudicatory Proceedings, 63 F.R. 41,872 (August 5, 1998), as well as the issuance of a case-specific order by the Commission providing further direction regarding the conduct and scheduling of the hearing. It should also be noted that a proposed rule, which would revise the Commission's rules of practice to provide streamlined licensing procedures specifically applicable to license transfer proceedings, was published in the Federal Register on September 11, 1998. A 30-day public comment period is provided.

Question 3. NRC's role in future nuclear energy development vis-a-vis DOE. (c) Discuss the factors that contributed to delays in regulatory action with Vogtle and LES, and the steps taken to prevent their recurrence.

Response. The Vogtle proceeding involved an application for the transfer of control of the facility's operating license from Georgia Power Company to the Southern Nuclear Operating Company which was challenged on grounds related to the character and integrity of the current and prospective licensee's management. Unlike other proceedings, concurrent with the ongoing licensing proceeding, the intervenor had filed a petition under the Commission's regulations requesting that an enforcement action be taken against the licensee based on the same facts asserted as grounds for denying the license transfer. These facts further related to a then ongoing investigation being undertaken by the NRC's Office of Investigations, which entailed a referral to the Department of Justice for consideration of criminal prosecution. Because of the related enforcement aspects, the staff declined to prove the transfer of operating authority and related amendments until completion of the proceeding. The delays in completion of the proceeding likewise stemmed largely from decisions to delay litigation pending resolution of the ongoing investigation. This action was also complicated by the need for the staff to decide whether to take enforcement action. In retrospect, it seems clear that at least some of the delay was not legally compelled.

Louisiana Energy Services (LES) proceeding involved a first-of-a-kind application for a private enrichment facility, involving a technology which had not previously been licensed by the Commission. During both the technical review and adjudicatory process, a number of novel legal and technical issues had to be addressed. With respect to the staff's technical review, it is now apparent that the application submitted by LES was not sufficient to enable the staff's review to be conducted on a timely basis, but that the staff did not aggressively address its shortcomings nor was the applicant fully responsive to staff requests for additional information.

In regard to the LES adjudicatory process, the record developed was complex and involved issues of first impression which, although brought to the Commission's attention, were not resolved in a timely manner. In addition, in an attempt to ensure that all issues were thoroughly addressed, the Licensing Board allowed a large amount of information into the record without insisting on adequate sponsorship by the parties to explain the significance of that information, which then had to be considered by the Board in reaching its decisions. These decisions themselves were excessively delayed, as the Licensing Board itself has acknowledged.

Notwithstanding that both the Vogtle and LES proceedings involved unique considerations not believed likely to recur, the Commission has attempted to address

sources of potential delay in future licensing actions in several ways. The staff now prepares a detailed review schedule for significant licensing actions such as license renewal, including the need to assure the adequacy of the license application itself and for bringing emerging technical issues to NRC management attention and, if necessary, to the Commission for guidance (both matters which also contributed to the delay of the LES proceeding).

In addition, the Commission has taken steps to streamline the adjudicatory process, while still assuring that a clear and complete record is created. The Commission has commenced a study of the entire hearing process and expects to receive recommendations, including recommendations on the need for legislation, by the end of this year. In the interim, on July 28, 1998, the Commission issued a "Statement of Policy on Conduct of Adjudicatory Proceedings," which provides guidance to the licensing boards, presiding officers and parties to Commission proceedings on how the Commission expects its proceedings to be conducted. The policy statement encourages licensing boards and presiding officers to establish case-specific schedules which are to be followed, to shorten filing and response times where practical, to manage discovery to avoid unnecessary delays in that stage of the adjudicatory process, to make sure that the parties comply with the Commission's regulations governing the submission of admissible contentions, and to issue decisions in a timely manner. It also stresses the obligations of all parties to adhere to the Commission's Rules of Practice and their respective burdens as participants, for example, with respect to submitting contentions and for offering evidence. In addition, the Commission indicated that it will itself carefully and actively monitor ongoing licensing proceedings to ensure that they are conducted expeditiously and that the boards, staff and other parties receive prompt guidance on emerging technical, policy and legal issues, as necessary. Consistent with its desire for expeditious processing of license applications, the Commission, on August 19, 1998, issued an order giving guidance and recommending a schedule to the Licensing Board that will preside over the licensing renewal proceeding for the Calvert Cliffs Nuclear Power Plant. Moreover, it is now considering whether to establish new, informal procedures for license transfer hearings that, if promulgated as a final rule, could, in general, substantially reduce the time for such hearings.

Question 4. Early warning for plants that exhibit declining safety performance is very important. The GAO report concluded that the NRC needs to make clear how it will respond—including a clear statement on what sanctions will be applied—when inspections identify problems. What steps has the NRC taken to address this concern.

Response. The NRC acknowledged the GAO recommendation and on August 18, 1997 provided the following response:

The NRC agrees that the licensee's responsiveness to identified problems is a critical performance criterion. The current NRC inspection and enforcement programs have well-established requirements that focus on this criterion. Recent changes to the SMM process, including development of an SMM nuclear power plant performance evaluation template, have clearly emphasized the importance of evaluating the licensee's responsiveness to identified problems. The staff has recently strengthened the corrective action evaluation criteria found in the "Staff Guidelines for Restart Approval" (Inspection Manual Chapter 0350), which is the guidance document used by the staff in assessing plants that are in an extended shutdown as a result of performance issues. In addition, the Commission directed the staff to further improve the SMM process by developing better indicators that can provide a more objective basis for judging whether a plant should be placed on or removed from the NRC Watch List. These improved performance indicators and objective measures will enhance staff's ability to take appropriate regulatory actions including additional enforcement where past enforcement actions have not been effective.

Question 4. The NRC's enforcement policy already identifies sanctions for licensees that fail to resolve problems within a definitive period. The NRC's enforcement policy provides for matching sanctions for a violation to the safety and regulatory significance of the violation and establishes a graduated system of sanctions that include noncited violations, notices of violations, civil penalties, and orders to modify, suspend, or revoke a license. The NRC imposes more substantial penalties for more significant problems. In determining the significance of a problem and the appropriate enforcement sanction, the established process also takes into consideration (1) the licensee's previous opportunity to identify and resolve the problem and (2) the length of time the problem remained unresolved because of the licensee's failure to take corrective actions.

Response. The enforcement history has been an important consideration in the SMM process. However, enforcement actions are taken on a timely basis and are not delayed until the next SMM. As a part of our effort to improve the SMM and the licensee performance assessment process, we will consider ways to make clear what NRC actions will be considered and applied when problems are not corrected in a timely manner.

Question 5. NRC's rule containing radiological criteria for license termination set an all pathways dose of 25 millirem/year for the unrestricted release of a decommissioned site. EPA encouraged the NRC to adopt a maximum level of residual contamination of 15 mrem/year with a separate 4 mrem/year ground water standard. EPA Administrator has threatened that EPA would apply the Comprehensive Environmental Response, Compensation, and Liability Act (through Superfund listing) if NRC and EPA do not reach agreement on applicable standards through a memorandum of agreement. Isn't this a classic example of dual regulation?

Response. Yes, this is an example of dual regulation. Fundamental policy differences exist involving the acceptable dose level (25 mrem/y vs. 15 mrem/y) and EPA's belief that a separate pathway standard for groundwater in addition to an all pathways standard is necessary.

NRC published a final rule establishing radiological criteria for decommissioning in July 1997. This rule established 25 millirem per year (mrem/yr) from all potential exposure pathways as the acceptable criterion for release of licensed sites for unrestricted use. The rule also requires that radiation doses be reduced below the rule's dose criterion through the As Low As Reasonably Achievable process. This rule is consistent with international and national scientific recommendations as well as EPA's 1994 draft Federal Radiation Protection Guidance for Federal Agencies. EPA stated that this is not protective of the public health and the environment, and that 15 mrem/yr from all pathways, with separate limits established for groundwater, is necessary. The EPA limits on groundwater would be the Maximum Contaminant Levels (MCLs). EPA would apply MCLs in groundwater, not at tap as specified in 40 CFR 141, National Primary Drinking Water Regulations, which are normally applied to drinking water at the tap. NRC disagrees with the EPA position, as discussed below.

First, the approach suggested by EPA results in the imposition of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) risk range on radionuclides without the informed and open discussions that would be part of the rulemaking process to establish such radiation protection standards—a process which NRC completed in 1997. The Commission's final rule is based on considerations of risk, radiation protection principles, national and international standards, and costs compared to associated benefits of cleanup. Second, there is no reason from the standpoint of protection of the public health and safety to have a separate, lower dose criterion for one of the pathways (i.e., groundwater) as long as, when combined, the dose from all pathways does not exceed the all-pathways dose standard. EPA's approach also overlooks the fact that MCLs, which EPA espouses for groundwater cleanup, are not set at consistent risk levels and include some that could result in exposures that exceed NRC's 25 mrem/yr all-pathways dose criterion, as well as others set at small fractions of a mrem. In issuing the final rule, NRC concluded that the final rule not only protects the public health and safety, but also establishes a framework to address the limited number of difficult cases which would otherwise require consideration of case-by-case exemptions. NRC considers that this approach provides adequate protection of the public health and safety and the environment, and constitutes cost effective regulation. NRC is also concerned that EPA's threat to apply CERCLA raises the question of finality for sites that have complied with the NRC or equivalent Agreement State cleanup standards and have had their licenses terminated. NRC considers that it is important to provide for finality in NRC and Agreement State license termination decisions in order to provide licensees and the public with a stable and predictable regulatory framework that is adequately protective of public health and safety and the environment.

In summary, dual regulation by EPA under Superfund is not necessary and is not a good use of limited Government resources and the resources of American citizens to whom the regulations apply.

Question 6. Is the NRC's radiological criteria for license termination consistent with international standards set by the International Commission on Radiological Protection (ICRP) and the National Council on Radiation Protection and Measurement (NCRP)?

Response. Yes, the NRC's radiological criteria for license termination are consistent with standards set by ICRP and NCRP. Applicable ICRP and NCRP findings

are contained in ICRP Publication 60 and in NCRP No. 116, respectively. Based on review of health and societal issues, both documents (while acknowledging the difficulty of setting standards for an "acceptable" public dose limit) arrive at 100 mrem/yr from all sources of radiation as a level that can be said to be acceptable. NCRP 116 notes that this value includes a review of risks of mortality faced by the public. The ICRP and NCRP approaches further reduce their 100 mrem/yr limit by the principle of "optimization," which includes considerations of constraints and cost-effectiveness. Specifically, NCRP 116 notes that no single source or set of sources should result in an individual being exposed to more than 25 mrem/yr. This fraction (of 100 mrem/yr) was presented as a simple alternative to having a site operator investigate all man-made exposures that an individual at the site would be exposed to so as to demonstrate that the total dose does not exceed 100 mrem/yr. The clear implication in this simple alternative is that, if individual sources are constrained to 25 mrem/yr, NCRP believes it likely, given the low potential for multiple exposures, that the public dose limit will be met. Further reductions considering ALARA would still be considered by NCRP 116. It is also important to note that ICRP, in its recent Publication 77, identifies 30 mrem/yr as the appropriate individual dose limit for the disposal of radioactive waste.

Using the nationally and internationally adopted principles of setting "individual dose and risk limits" and "optimization of protection" (noted above) and an additional margin of safety to allow for the potential for exposure to more than one radiation source, the NRC developed its final rule on radiological criteria for license termination.

Question 7. (A) Is legislative action necessary to resolve this [dual regulation] problem?

Response. The Commission has tried to develop an understanding with EPA in the form of a Memorandum of Understanding on decommissioning and decontamination of contaminated sites. However, in over a year of effort to reach an agreement, there has not been progress made to date. It has become apparent that EPA's commitment to its current regulatory approach differs significantly from NRC's support of fundamental radiation protection standards, as described in national and international standards, that are based on considerations of risk and costs compared to associated benefits of clean up.

In other words, there are substantial differences between NRC and EPA on the basis for protection of public health and safety and the environment. Among other things, this raises the issue of finality of NRC or Agreement State decisions on license termination. NRC believes that it is important to provide for finality in such decisions thereby establishing a stable and predictable regulatory framework that is adequately protective of public health and safety. Recognizing that dual regulation is wasteful of Government resources and the resources of the American people, the Commission has concluded that the resolution of the differences between the EPA and the NRC with respect to cleanup of radioactive contamination is a matter of policy that can best be solved by Congressional action. The NRC Chairman sent a letter to Senator Chafee on July 16, 1998, recommending that Congress address this issue. A copy of Chairman Jackson's letter is enclosed.

ENCLOSURE: LETTER TO SENATOR CHAFEE FROM CHAIRMAN JACKSON

July 16, 1998

THE HONORABLE JOHN H. CHAFEE, *Chairman*
Committee on Environment and Public Works
U.S. Senate
Washington, D.C. 20510

DEAR MR. CHAIRMAN: The purpose of this letter is to express the views of the Nuclear Regulatory Commission (NRC) regarding the resolution of the differences between the Environmental Protection Agency (EPA) and the NRC with respect to cleanup of radioactive contamination. We had discussed this matter when I met with you on April 28, 1998. And, as you are aware, the EPA forwarded its views to you via a letter dated March 28, 1998. For the reasons explained in this letter, the Commission believes that the resolution of these differences is a matter of policy that can best be solved by Congressional action.

The NRC is committed to fundamental radiation protection standards, as described in national and international standards. This commitment is reflected in NRC's Rule on Radiological Criteria for License Termination, which was issued on July 21, 1997. The rule was arrived at through an enhanced participatory rule-making process and was accompanied by a voluminous environmental impact state-

ment and extensive regulatory analysis. It is based on considerations of risk, radiation protection principles, national and international standards, and costs compared to associated benefits of cleanup. It uses the principles of setting of an individual dose limit, risk limits, and optimization of protection, plus an additional margin to allow for the potential for exposure to more than one radiation source. NRC's rule includes an all pathways dose criterion of 25 mrem/yr and, additionally, requires that doses be reduced below the rule's dose criterion through the ALARA process, which requires NRC licensees to achieve doses to members of the public that are as low as reasonably achievable. Demonstration of compliance with the all-pathways dose criterion requires evaluation of the groundwater pathway. The approach of using an all-pathways dose criterion provides a dependable, risk-based standard and is consistent with the recommendations of the National Academy of Sciences, national and international scientific organizations, as well as EPA's 1994 draft Federal Radiation Protection Guidance for Federal Agencies.

Nevertheless, EPA questions basic aspects of NRC's Rule on Radiological Criteria for License Termination, maintains that NRC's radiological criteria for license termination are not protective of public health and the environment, and asserts that if EPA is not satisfied with cleanups conducted to the NRC-established level, EPA may decide to list a previously NRC decommissioned licensee on the National Priorities List. Among other things, this raises the issue of finality of license termination, and possible EPA actions at sites that have complied with the NRC or equivalent Agreement State cleanup standards and had their licenses terminated. We believe that it is important to provide for finality in NRC and Agreement State license termination decisions order to provide licensees and the public with a stable and predictable regulatory framework that is adequately protective of public health and safety and the environment.

In addition, EPA faults the NRC for not establishing a separate, specific requirement for groundwater pathways. This ignores the fact that, under the standards established by the NRC, the dose to a member of the public from all pathways of exposure (air, water, food, and direct radiation) would not be permitted to exceed 25 mrem/yr for those cases in which the NRC would permit unrestricted release of the decontaminated site. It also overlooks the fact that maximum contaminant levels (MCLs) established under the Safe Drinking Water Act (SDWA), which EPA espouses for groundwater cleanup, are not set at consistent risk levels (and include some that are above the NRC's dose criterion). Further, the costs of meeting certain MCLs may be excessive compared to the benefits obtained (in some cases, trillions of dollars per individual health effect averted).

Another aspect of NRC's concern with the application of MCLs is EPA's position that it lacks flexibility with respect to setting drinking water standards and MCLs of radionuclides under the Safe Drinking Water Act and, as such, the application of MCLs for radionuclides under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA). It is also EPA's view that application of drinking water standards in other contexts, such as cleanup standards for radioactive contamination or standards of control for monitoring radioactive waste disposal facilities, has no bearing on the proper setting of the drinking water standard, and that the legislative direction in the SDWA prohibits increasing any groundwater standards, such as MCLs, regardless of what changes in science may indicate. In contrast, NRC is not subject to any statutory prohibition on using the latest methodology or advances in science for limiting radiation doses to individuals or principles established in international agreements in setting standards to maximize protection of the public's health and safety. This difference in legislative mandates further exacerbates the differences between the NRC and EPA on radioactive disposal and cleanup.

We recognize that dual regulation is wasteful of both Government resources and the resources of American citizens to whom the regulations apply. Therefore, we have attempted to reach an understanding with EPA in the form of a Memorandum of Understanding (MOU) on decommissioning and decontamination of contaminated sites. I sent EPA Administrator Browner a draft MOU on the subject on August 6, 1997. In response, on February 19, 1998, EPA sent its a revised MOU for consideration. After NRC staff reviewed the EPA-revised MOU the Commission came to the conclusion that fundamental differences exist between our two agencies, on the basis for protection of public health and safety and the environment. These fundamental differences have the potential for severely impacting a number of areas that fall under NRC jurisdiction such as high-level waste, transportation, and use of radioactive material in medicine.

In sum, the Commission believes that Congressional action can best resolve the differences between EPA and the NRC. Further, we continue to believe, consistent with the standards of the international community, that the approach used in

NRC's cleanup rule provides all the regulation necessary for adequate protection of public health and safety and the environment. We are aware, of course, that EPA opposes that view, and has expressed a preference for continuing interagency deliberations. However, we believe that the EPA's commitment to its current regulatory approach differs so significantly from NRC's support of fundamental radiation protection standards as described in national and international standards that a Congressional resolution of the differences is desirable.

Sincerely,

SHIRLEY ANN JACKSON.

Question 7. (B) If so, what action should Congress take to address this problem?

Response. The Commission urges that any legislation reauthorizing CERCLA contain language comparable to that found in section 810 of H.R. 3000. The NRC believes, consistent with the standards of the international community, that the approach used in NRC's Rule on Radiological Criteria for License Termination, issued on July 21, 1997, provides all the regulation necessary for adequate protection of public health and safety and the environment, and we strongly urge support of that approach in legislation for the reauthorization of CERCLA. The rule was arrived at through an enhanced participatory rulemaking process and was accompanied by a voluminous environmental impact statement and extensive regulatory analysis. It is based on considerations of risk, radiation protection principles, national and international standards, and costs compared to associated benefits of cleanup. It uses the principles of setting of an individual dose limit, risk limits, and optimization of protection, plus an additional margin to allow for the potential for exposure to more than one radiation source.

Question 8. You discussed your NRC Strategic Assessment and Rebaselining effort which is over 3 years old. What are the most serious self criticisms that came out of that self evaluation, and what have you done about them? (page 1)

Response. The most significant self-criticisms concerned (1) the slow progress of moving toward a more risk-informed and performance-based regulatory framework, (2) the excessive duration and effort needed to complete some licensing actions, (3) the efficiency and effectiveness of the inspection, performance assessment and enforcement processes and (4) the less than optimal organizational relationships and responsibilities to support regulatory initiatives.

To address these issues the Agency has, for example, (1) developed guidance documents for risk-informed applications, implemented a senior management oversight committee, and monitored higher priority risk-informed licensing submittals; (2) sought to better define the organizational responsibilities of the Office of Nuclear Reactor Regulation to focus on the timely completion of licensing submittals; (3) worked with industry to identify improvements in our inspection, assessment, and enforcement processes that focus on safety and risk significance; and (4) shifted the responsibility for rulemaking activities from the Office of Regulatory Research to the cognizant Program office to provide a more effective and efficient rulemaking process.

The Strategic Assessment and Rebaselining effort was the initial step in implementing a new planning, budgeting, and performance management process. One of the principal purposes of NRC Strategic Assessment and Rebaselining effort was to identify activities that the NRC engages in, group these activities appropriately, identify potential strategic or direction setting issues associated with these groups of activities, and provide an opportunity for the Commission to define a long term direction for the Agency. Commission decisions, for example, associated with the Strategic Assessment and Rebaselining effort dealt with areas such as oversight of the Department of Energy; risk-informed and performance-based regulation; high-level waste; the role of industry and public communications. The process provided the Commission with options for reaffirming or changing the direction of the agency. The Strategic Assessment and Rebaselining effort supported the subsequent development of the agency's Strategic Plan, the agency's Performance Plan, and each office's Operating Plan by helping to prioritize activities and identifying areas where process or activities should be eliminated or enhanced. Resources and planned accomplishments were identified to implement the Strategic Plan and as the agency moves forward performance assessment and monitoring will provide feedback to further refine our strategic direction.

Over the last 2 years, critical self-assessments have resulted from implementation of the Commission decisions associated with the Strategic Assessment and Rebaselining effort, from resolution of over 200 process- and implementation-related issues identified during development of the directions setting issues, and from the oversight afforded by the enhanced budgeting and planning process.

Question 9. (A) What are your "clear safety standards"? (page 2) How are they defined? How do they relate to the regulations? How are they implemented?

(B) How do you ensure the inspectors and reviewers don't go beyond the legitimate bounds in assessing "safety standards"? What direction do you give to your managers when they determine reviewers have gone beyond the bounds of the "safety standards"?

Response. (At The referenced quotation from page 2 of the statement submitted by the USNRC to this Senate Subcommittee notes that NRC has been criticized for a "lack of rigor in demanding strict adherence to clear safety standards." This criticism, in part, is that NRC lacks clear safety standards. The Atomic Energy Act of 1954, as amended, establishes "adequate protection" as the standard of safety on which NRC regulation is based. The Commission's regulations establish the basis for meeting that standard. In addition, regulations require the license (including the Technical Specifications) and Updated Final Safety Analysis Report to provide further plant-specific detail as to the standards that a plant must meet to operate safely.

Some of the Commission's regulations are prescriptive, describing precisely what is required for compliance. However, most of the regulations are based on a recognition that there are multiple means of achieving equivalent degrees of safety. Therefore, the Commission has established guidance documents such as NUREGs, Regulatory Guides, the Standard Review Plan, and Branch Technical Positions to state methods of achieving compliance that are acceptable to the Commission. Licensees may propose alternative methods of compliance that provide equivalent degree of safety. Therefore, safety standards are defined by NRC regulation and associated guidance documents.

(B) Assurance that a licensed facility meets the regulations is gained through the licensing and inspection processes. To provide for consistency, evaluations of current plant design and operation conducted by inspectors and evaluations of proposed licenses and amendments conducted by technical reviewers are required to follow a set of guidance documents. The Standard Review Plan (NUREG 0800) supplements the various regulatory guidance documents to provide a framework for licensing technical review. A detailed inspection program manual and implementing procedures, the Enforcement Manual, and enforcement guidance memoranda provide guidance for inspectors in evaluating a licensee's implementation of the approved design and ongoing operation of the facility. Additional process guidance is provided in NRR and Region Office Letters and policy memoranda. This guidance is generally available in the public domain.

When an NRC manager determines that an inspector or reviewer has made conclusions that are inconsistent with established guidelines, the manager is expected to resolve the issue and ensure that the assessments and conclusions are consistent with established guidance documents, provide an appropriate characterization of safety aspects of the review, contain no additional policy issues, and communicates the appropriate message to licensees. In the case of inspection reports, inspectors and the licensee meet, prior to publication of the report, to discuss inspection findings and provide an opportunity for the licensee to discuss concerns with the agency's assessment. Inspection reports are reviewed by the appropriate level of management prior to being issued to licensee.

In addition to management oversight of the licensing review and inspection programs, both internal NRC policy and the regulations themselves provide opportunities for interested stakeholders to contest the staff's actions. For the industry, perceived NRC staff excesses may be challenged through four processes that monitor concerns raised by licensees. (1) Licensees can report concerns to NRC management during periodic site visits required by Inspection Manual Chapter (IMC) 0102, "Oversight and Objectivity of Inspectors and Examiners at Reactor Facilities." IMC 0102 requires NRC management to make periodic site visits to solicit feedback from their licensee counterparts regarding implementation of the NRC regulatory programs at their facility. Concerns raised by licensees during IMC 0102 visits are evaluated annually with the results reported to the Commission. (2) Each region has a formal process to evaluate and resolve licensees' complaints of inappropriate regulatory action by NRC employees. Each procedure requires a determination if the issue should be pursued by the Office of the Inspector General (OIG) or the region. For issues reviewed by the region, the regional administrator approves a course of action including any specific remedial actions. (3) If the issue is referred to the OIG, the matter is handled in accordance with Management Directive 7.4, "Reporting Suspected Wrongdoing and Processing OIG Referrals." (4) A formal process was established in July 1995 for senior power reactor licensee officials to report perceived inappropriate regulatory action directly to the Office of the EDO. Independent of these processes, licensees can informally discuss any concern directly with their

counterpart in the regional office or in ERR at any time. In addition, if the staff's action is perceived as being too lenient, any person may file a request pursuant to 10 CFR 2.206 to institute a proceeding to modify, suspend, or revoke a license, or for other such action as may be proper.

Question 10. What are your objective performance standards? What are your metrics? (page 3)

Response. As discussed in response to Question 9, historically, safety performance has been assessed by NRC judgment of how well a licensee adheres to the safety standards defined by NRC regulation and implemented through licensing processes. The NRC's regulations promulgate requirements ranging from the highly prescriptive, to requirements that are more broadly stated which require supplemental regulatory guidance (e.g. NRC Regulatory Guides and Standard Review Plans) reflecting one or more acceptable implementation alternatives. These Guides are not designed to cover every option, but are instead a yardstick against which to measure alternatives.

Currently, NRC uses processes such as Senior Management Meetings (SMMs), and Plant Performance Reviews (PPRs) to perform a qualitative integrated assessment of licensee performance. Additionally, NRC uses quantitative performance data (such as forced outage rate; number of safety system failures; equipment forced outages; automatic scrams while critical; collective radiation exposure; and number and severity level of recent enforcement actions) at the SMMs to support findings of performance changes.

NRC has initiated efforts to develop and rely on more objective nuclear plant performance indicators for reactor inspection and assessment processes. Several public meetings have recently been held with industry representatives and a major public workshop is scheduled for late September 1998 to discuss industry and NRC perspectives on attaining a more objective performance assessment process which would integrate information sources, including a set of selected performance indicators. This effort is intended to develop a process that will allow transition to a more quantitative set of performance indicators and has near-term deliverable dates in early 1999.

Question 11. (A) You mention "improved efficiency". (page 5) How does NRC measure internal work processes efficiency?

(B) What expectations have been provided to the staff relative to expected review times?

(C) How successful have you been in improving process times? Have you started measuring process times?

Response. The NRC developed a Strategic Plan and a Performance Plan for the Agency and Operating Plans for the individual Agency Offices and Regions. The Office and Regional Operating Plans contain performance plan output measures which in turn contain activity-specific milestones and metrics. The metrics contain standards for quantity, quality, timeliness, and efficiency. Labor rates obtained from the Office tracking systems are typically used to measure the efficiency of the work process. The staff participates in the development of the Operating Plans and the goals set forth in the Operating Plans are being incorporated into staff performance appraisals. Work processes are monitored by management, and as activities are carried out, schedules are adjusted accordingly. Operating Plan standards are being reviewed and improved as needed on a quarterly basis.

Using these standards, the NRC measures review process efficiency several ways including product volume (licensing actions completed), backlog inventory and backlog age demographics.

Expectations regarding expected review time are related directly to the priority assigned to the review. The priority of a review task is determined primarily on the basis of safety significance, risk considerations, and operational impact. However, in some situations, priority is dictated by Commission or EDO directive resulting from policy considerations, or by statutory requirements such as deadlines imposed by rule or regulation. For example, policy considerations have a significant bearing on the priority assigned to review tasks for license renewal. Four levels of review priority are broadly defined in staff guidance. Higher priority work is to be accomplished first; however technical complexity may dictate that the review takes longer than other tasks of low priority and low complexity. Other factors may affect review times are quality of the submittal in support of the proposed action and timeliness of the applicant's response to requests for additional information.

Until recently, the expectations were that 80 percent of licensing action review tasks would be completed within 1 year, 95 percent would be completed within 2 years and all tasks would be completed within 3 years. As a result of a recent Com-

mission directive, the expectations have been raised and resources have been applied to achieve the higher expectations. In general, the new expectations are that 95 percent of licensing action review tasks will be completed within 1 year and all tasks will be completed within 2 years.

The number of licensing actions completed, the current inventory, and the actual number and percentage of licensing actions exceeding 2 years are reported to management on a monthly basis. Recently, the volume of licensing actions completed has improved, although the percentage of licensing actions exceeding the age goals has increased somewhat. Thus, we recognize improvements are needed. Management attention is being focused on this area.

The Commission recently challenged the staff to reduce the licensing inventory to a historic low of 700 licensing actions by the end of fiscal year 2000. The NRC's fiscal year 2000 budget proposal will include the resources needed to achieve this goal.

The Regional Offices measure their performance in a similar way by monitoring inspections completed (and associated number of inspection hours completed at each site), timeliness, and quality of inspection and associated assessment reports, and enforcement actions. These indicators have shown continued improvement over the past several months.

Question 12. You say you are working to make inspection, enforcement and assessment processes better. (page 6) How are you monitoring abuses of these activities?

Response. The NRC interacts regularly with industry groups (NEI and INPO) to gain the group's perspective on various regulatory issues. Additionally, the NRC has four processes that monitor concerns raised by licensees. Independent of these processes, licensees can informally discuss any concern directly with their counterpart in the regional office or in NRR at any time. (1) Licensees can report concerns to NRC management during periodic site visits required by Inspection Manual Chapter (IMC) 0102, "Oversight and Objectivity of Inspectors and Examiners at Reactor Facilities." IMC 0102 requires NRC management to make periodic site visits to solicit feedback from their licensee counterparts regarding implementation of the NRC regulatory programs at their facility. Concerns raised by licensees during IMC 0102 visits are evaluated annually with the results reported to the Commission. (2) Each region has a formal process to evaluate and resolve licensees' complaints of inappropriate regulatory action by NRC employees. Each procedure requires a determination if the issue should be pursued by the Office of the Inspector General (OIG) or the region. For issues reviewed by the region, the regional administrator approves a course of action including any specific remedial actions. (3) If the issue is referred to the OIG, the matter is handled in accordance with Management Directive 7.4, "Reporting Suspected Wrongdoing and Processing OIG Referrals." (4) A formal process was established in July 1995 for senior power reactor licensee officials to report perceived inappropriate regulatory action directly to the Office of the EDO.

Question 13. You talk about "plants experiencing performance problems." (page 6) How do you judge performance? What metrics do you use? How do they relate to safety?

Response. Historically the NRC has judged plant performance through the integration of a combination of performance indicators such as the frequency and severity of plant events, and the results of NRC inspections including enforcement history. Such information available to the NRC is brought together for review of each plant on a six month cycle (Plant Performance Review) to adjust regional inspection resources and to detect adverse trends potentially stemming from programmatic weaknesses. Additionally, senior agency managers meet annually (recently changed to an annual Senior Management Meeting [SMM]), previously was semiannual to review plants whose poor performance may warrant increased NRC senior management attention and overall agency resource expenditures. Quantitative data are used at these senior management meetings to support findings of performance changes. This evaluation process integrates quantitative and qualitative performance measures such as Plant Performance review findings, safety inspection findings, enforcement history, safety equipment performance history, Licensee Event Reports, number of allegations received, and trend plots of some of these indicators. However, performance assessment processes in general have not relied solely on these data to determine outcomes, but have utilized a diversity of NRC participants to help achieve consistency across plants, regions, and time. The level of safety performance by any specific plant is determined through the assessment processes noted above. Changes to these processes within the last year have included an effort to make the bases for their outcomes more clear, such as publishing the Plant Issues Matrix (basis for PPR outcome) and minutes of the SMMs. Additionally, the Commission recently authorized suspension of the Systematic Assessment of Li-

censee Performance in order to allow additional resources to be devoted to development of a new assessment process. The NRC initiative includes input from industry and public participation, to determine if safety performance can be more directly tied to measurable indicators, where such indicators can be shown to be closely aligned with plant risk.

Question 14. (A) You state that you have "adopted measures that internally challenge the need for each generic communication." How have you done that?

Response. The internal challenge on the need for a generic communication is done in a series of reviews with an increasing level of management involvement based on its overall significance. As a first step, a multidisciplinary staff level review of a potential problem is performed by the Events Assessment Panel with representatives from the offices of Nuclear Reactor Regulation (NRR), Analysis and Evaluation of Operational data (AEOD), and Office of Regulatory Research (RES). This panel reviews the need for each generic communication and suggests the appropriate type of communication.

Generic letters and bulletins require senior management approval. In an August 7, 1998 memorandum, the director of NRR provided guidance to the staff regarding the need to brief senior management before preparing a generic letter or bulletin. The briefing must show the safety benefit achieved compared to the burden imposed on licensees and staff is justified before the generic communication is allowed to proceed through a defined review process. Next, the Committee to Review Generic Requirements (CRGR) conducts a structured review of all proposed generic letters and bulletins in accordance with an established process intended to assure there is "value-added" from the particular communication. At this stage, the office of General Counsel reviews the document and if requested it is forwarded to the Advisory Committee on Reactor Safeguards (ACRS).

Public comments on the draft generic letter or bulletin are sought through Federal Register Notice. The Commission also reviews significant final communications before issuance. (See the response to question No: 61 for the various types of NRC communications).

Question 14. (B) How have you applied the backfit rule to these communications?

Response. Generic letters and bulletins only request actions and do not impose requirements. Licensees have the option to propose alternate actions or take no action with appropriate justification. The backfit rule (10 CFR 50.109) does not strictly apply until the point at which a backfit is required by rule or order. However, new generic positions in documents such as bulletins, generic letters and regulatory guides are internally reviewed as potential backfits to ensure that they meet the standards of the backfit rule before they are issued.

In the course of preparing bulletins and generic letters, as described in the answer to question in 14a, NRC staff must prepare a package for CRGR review that provides, in part, the regulatory basis for a proposed staff position, and the rationale for it being an adequate protection or compliance backfit pursuant to 10 CFR 50.109(a)(4), rather than a backfit pursuant to 10 CFR 50.109(a)(2). Furthermore, the bulletin or generic letter itself must contain a backfit discussion which provides the rationale for the NRC staff finding. The CRGR reviews all draft bulletins and generic letters to ensure that the regulatory basis for the proposed staff position is appropriate, and in conformance with the standards of the backfit rule. If the CRGR finds that a proposed staff position involves a backfit pursuant to 10 CFR 50.109(a)(2), the CRGR will recommend to the Executive Director for Operations disapproval of the proposed staff position. Further effort on the bulletin or generic letter will cease, pending referral of the matter to the Office of Nuclear Regulatory Research to conduct a backfit analysis pursuant to 10 CFR 50.109(c), in accordance with the directives and guidance of NUREG/BR-0058 and NUREG/BR-0184.

Question 15. How will you avoid your staff pressuring licensees "into actions in excess of regulatory requirements"? (page 9) What sanctions will you put in place? What recourse method will you provide utilities to challenge staff pressure? Will you set up a "licensee concerns" program?

Response. The NRC implements numerous actions to train its staff as to expected professional performance, including the area of inappropriate staff pressure. Standards for staff professionalism and behavior are addressed in the "NRC Principles of Good Regulations" and in the NRC technical staff performance expectations issued to each employee. These requirements are reinforced by senior NRC managers in the course "Fundamentals of Inspection" and related refresher courses and in resident counterpart meetings, workshops, and training courses. Additionally, the NRC actively solicits feedback from licensees to promptly identify and resolve any improper staff actions. In July 1995 the Commission issued a policy statement to es-

establish clearly its expectation for the NRC staff and licensees to have open and professional communication at all organizational levels. In the policy, the Commission also encouraged licensees to raise issues regarding inappropriate regulatory action by a member of the NRC staff.

Licensees can informally discuss any concern directly with their counterpart in the regional office or in NRR at any time. As noted in response to questions No. 9 and No. 12, licensees have several processes available to them to raise concerns and seek recourse, including concerns regarding staff pressure. Licensees can report concerns to NRC management during periodic site visits. Inspection Manual Chapter (IMC) 0102, "Oversight and Objectivity of inspectors and Examiners at Reactor Facilities" requires NRC management to make periodic site visits to solicit feedback from their licensee counterparts regarding implementation of the NRC regulatory programs at their facility. Concerns raised by licensees during IMC 0102 visits are promptly addressed and subsequently evaluated annually with the results reported to the Commission. Additionally, each region has a formal process to evaluate and resolve licensees' complaints of inappropriate regulatory action by NRC employees. The procedures require a determination of whether the issue should be pursued by the Office of the Inspector General (OIG) or the region. For issues reviewed by the region, the regional administrator approves a course of action including any specific remedial actions. If the issue is referred to the OIG, the matter is handled in accordance with Management Directive 7.4, "Reporting Suspected Wrongdoing and Processing OIG Referrals." Finally, in July 1995, a formal process was established for senior power reactor licensee officials to report perceived inappropriate regulatory action directly to the Office of the EDO. Regarding sanctions, if an issue is substantiated, agency management develops a plan, including a schedule for implementation, to execute remedial actions; communicates the findings and concerns to the employee; and initiates a corrective action plan, which depending upon the severity of the issue, could include personnel action.

Question 16. You state that the NRC is adopting a risk-informed, performance-based approach to rulemaking (page 5) and you cite two examples: (1) Appendix J, Option B and (2) the Maintenance Rule. What other regulations have been modified or do these "examples" represent all that has been accomplished so far?

Response. The Commission has worked, and is continuing to work, to achieve an appropriate balance between deterministic and risk-informed regulations and between prescriptive and performance-based regulations. The two rulemakings were cited as examples of performance-based regulatory initiatives. In fact, in several rulemakings that have been conducted over the past few years, the Commission has considered and taken a risk-informed and/or performance-based approach when making rule changes. In the reactor area, requirements associated with anticipated transients without scram events (10 CFR 50.62), loss of alternating current electric power (10 CFR 50.63), technical specifications (10 CFR 50.36), and changes to the required frequency of FSAR updates (10 CFR 50.71), appropriately incorporated risk-informed, performance-based concepts.

NRC's existing HLW and LLW disposal regulations, 10 CFR 60 and 10 CFR 61 respectively, are both risk-informed and performance based. Recent revisions to 10 CFR Parts 34, "Licenses for Industrial Radiography and Radiation Safety Requirements for Industrial Radiographic Operations," and 36, "Licenses and Radiation Safety Requirements for Irradiators," were developed using risk information. The revision to Part 34 incorporates a number of changes that provide greater flexibility to radiographers in a number of performance review areas. In addition the Commission, in revising 10 CFR Part 35, "Medical Use of Byproduct Material," is restructuring it into a risk-informed, more performance-based regulation. Modifications to Part 39, "Licenses and Radiation Safety Requirements for Well Logging," using risk information are currently ongoing to address newer technology. There have been several revisions to 10 CFR Part 20, "Standards for Protection against Radiation," which are risk-informed and performance based. These include revision to the doses received from individuals administered radioactive material and released in accordance with 35.75, revision of the monitoring criteria for declared pregnant workers and minors, and radiological criteria for release of sites for restricted or unrestricted use.

The staff is developing new regulations specific to Yucca Mountain for disposal of high level waste in a geologic repository using a risk-informed, performance-based approach. The staff is revising 10 CFR Part 70, "Domestic Licensing of Special Nuclear Material" to make it more risk-informed and less prescriptive based on risk insights gained from regulating these types of facilities for several decades.

The staff is revising 10 CFR Part 72, "Licensing Requirements for the Independent Storage of Spent Nuclear Fuel and High-Level Radioactive Waste," to use a risk-

informed approach regarding the seismic criteria for siting independent spent fuel storage installations. The staff is also revising 10 CFR 50.59 and 72.48 concerning the processes controlling licensee changes, tests, and experiments to take a more risk-informed approach.

The NRC worked with the Department of Transportation to provide procedures under new regulations that enable the shipment of decommissioned reactor steam generators to a disposal facility, without undergoing a specific steam generator transportation certification process. Moreover, the staff is taking into account risk information in its assessment regarding the technical adequacy of shipping the Trojan reactor vessel intact with its internals.

As other regulations are revised or developed, the staff has been directed to consider whether a risk-informed and/or performance-based approach can be adopted.

Question 17. With respect to enforcement, you state (page 7) that the increase in non-escalated violations stems from a concerted effort to improve consistency across the agency. Striving for consistency in a process that is inconsistent with industry performance does not appear to be a good use of NRC resources. What other remedies are you contemplating to fix this problem?

Response. The NRC has taken several short-term actions to address the non-escalated enforcement process and ensure that enforcement related activities are based upon safety significance. The proposed changes are also expected to reduce the licensee burden in this area. The efforts underway (some of which merely involve exercising self-discipline in carrying out existing NRC policy) include: (1) ensuring that the NRC staff gives credit for licensee actions both in identifying and correcting violations in deciding whether to cite a low-level violation; (2) not requiring a written response when low-level violations are issued and corrective actions are addressed sufficiently in writing elsewhere on the docket (e.g., in a Licensee Event Report); (3) providing more consistent treatment when multiple violations are identified with a common root cause; and (4) clarifying NRC staff guidance for the treatment of violations identified as the result of licensee corrective actions. In short, the intent is to simplify the disposition of these types of violations. The NRC's Office of Enforcement issued enforcement guidance memorandum (EGM 98-006) on these issues on July 27, 1998, and subsequently provided training to key staff.

In addition, as part of ongoing efforts, such as the NRC enforcement policy revision and request for public comment issued in May 1998, the NRC will seek to identify other measures to improve consistency and to ensure a safety focus in documenting and dispositioning violations.

The NRC held a public meeting with stakeholders on September 3, 1998, to solicit input on possible enforcement policy revisions. A revision of non-escalated enforcement policy is expected to be presented to the Commission in October for their approval. The NRC staff is expected to develop additional guidance on regulatory significance by late Fall of this year and thresholds for low-level and minor violations at the end of this year. The NRC staff plans on developing risk-informed examples for inclusion in the supplements of the enforcement policy in the Spring of 1999. The NRC staff also expects a proposal from NEI for changes in escalated enforcement policy and will review that proposal and report to the Commission in the Spring of 1999.

Question 18. On page A-20, you state the number of NRC inspection hours per plant has been reduced from 3100 in 1990 to 2500 in 1997. This is a decrease of about 20 percent. However, the number of FTEs devoted to reactor safety was 1480 in 1990 and 1499 in 1997, an increase of 1 percent. Please explain where these reduced inspection hours went? Why didn't the total number of FTEs decrease in response to reduced inspection activity?

Response. The Reactor Safety and Safeguards level of effort of 1480 FTE (fiscal year 1990), referred to in the question, reflects the office of Nuclear Reactor Regulation (NRR) and Regional effort in support of the Nuclear Reactor Safety Program. The NRC Budget for that year was developed organizationally, whereas the fiscal year 1997 budget was developed programmatically. Therefore, the FTE level of 1499 in fiscal year 1997 includes not only NRR and Regional support efforts, but also 5 additional NRC offices contributing to the Nuclear Reactor Safety Program. In fiscal year 1997, the FTE associated with just NRR and Regional effort is 1187 FTE, which when compared to 1480 FTE in fiscal year 1990 represents approximately a 20 percent reduction and is consistent with the reduction in the inspection hours.

Question 19. On page 7, you should state that the agency intends to improve guidance on factoring risk into enforcement decisions. Is it true that the current enforcement policy only allows risk insights to increase civil penalties, but can't be used to

decrease the severity level of a violation? If so, how can this "one-way" approach be truly risk-informed?

Response. It is not true that the enforcement policy does not allow risk insights to decrease the severity level of a violation. The enforcement policy states that the first step of the enforcement process is to evaluate the relative importance of each violation, including both the technical and regulatory significance (e.g., repetition, willfulness, pervasiveness). The enforcement policy was revised on December 10, 1996, to clarify that technical significance includes both actual and potential consequences and that risk is an appropriate consideration in evaluating the technical significance of a violation. The Statements of Consideration stated:

In analyzing risk, the NRC recognizes the uncertainties associated with risk assessment. Generally, qualitative rather than quantitative risk assessments are made given the number of variables associated with risk assessment. Risk should be a consideration in proposing enforcement actions, but not necessarily determinative. In developing higher civil penalties, the Commission intends to consider, where appropriate, assessing separate civil penalties for each violation that is aggregated into a Severity Level II problem.

The staff issued additional guidance on risk considerations in enforcement actions in an enforcement guidance memorandum (EGM 97-011), dated June 6, 1997. The guidance states that risk is a relevant consideration in enforcement decisions concerning severity levels, appropriateness of sanctions, and the exercising of enforcement discretion. It also stated that the staff should continue to balance risk information against the guidance currently provided in the enforcement policy and the enforcement policy supplements. Judgment must be exercised in the use of risk significance as a factor in decisions regarding the appropriateness of the sanction. While there may be cases where, due to increased risk significance, it is appropriate to escalate both the severity level and the sanction in order to convey the correct regulatory message to the licensee and the use of enforcement discretion may be warranted to reach the proper enforcement action, it may also be appropriate to reduce levels of enforcement due to low risk significance. This guidance document did not address this aspect of using risk information and the staff is currently revising its enforcement manual to make this clear.

While a higher severity level and sanction may be warranted for violations that have greater risk significance, it may be appropriate to consider a lower severity level or enforcement action for issues that have low risk significance. As stated before, risk is only one component in the consideration of the appropriate severity level. Severity level considers actual consequence, potential consequence (risk), and regulatory significance. Therefore, a violation with little or no actual safety consequence and lower risk significance may still pose a significant regulatory concern and warrant a higher severity level and/or sanction. In deciding whether a violation should be categorized at Severity Level III or IV, risk significance is considered. In some cases, the matter may be so minor, it need not be cited. Low risk does not excuse noncompliance. If a licensee believes an issue is of low risk and not worthy of being a requirement, the licensee may seek a change to the requirement. However, compliance is required until the requirement is.

Finally, it is important to recognize that risk insights have an opportunity to influence agency action from the point of identification in the inspection process through the point of disposition in the enforcement process. As more risk-informed and performance-based approaches are applied to the agency's regulatory process and inspection activities, these approaches will be inherently factored into the enforcement process.

Question 20. We understand that the enforcement policy was removed from the regulations and is now a Commission Policy Statement. Given that it is no longer burdened with the constraints of your rulemaking process, why will it take you 6 months to revise your own policy that is within your control to change?

Response. First, as a point of clarification, from October 7, 1980, when the NRC enforcement policy was first published and codified in the Code of Federal Regulations (CFR) at 10 CFR Part 2, Appendix C, up until June 30, 1995, when it was removed, the Commission maintained that the enforcement policy was a policy statement and not a regulation. The enforcement policy was included in the Code of Federal Regulations to provide widespread dissemination. The enforcement policy was removed from the regulations in 1995 (60 FR 34380) after concerns were raised that it could inadvertently be considered as a regulation instead of a policy statement. The enforcement policy was subsequently published as NUREG-1600 to ensure continuing widespread dissemination.

It is true that as a policy statement, the Commission has more flexibility in revising its enforcement procedures than if it were a regulation. However, the Commission recognizes the importance of this policy statement and judiciously revises it after appropriate analysis and consideration. More than ever, the Commission recognizes the need to solicit input from its stakeholders to ensure meaningful outputs and outcomes from any proposed policy revisions. The agency staff met with its stakeholders to discuss its enforcement policy, with an emphasis on non-escalated enforcement, on September 3, 1998. The Commission intends to move forward as expeditiously as possible in making appropriate revisions to its enforcement policy as described in response to Question 17 and in providing training to its staff.

Question 21. On page 11, you note that the proposed fiscal year 1999 appropriations level will reduce your budget request by at least \$17.8 million, causing you to curtail inspection and reactor oversight programs, curtail safety research and substantially reduce many support activities. Given that \$17.8 million is only 3.5 percent of your requested budget, please explain why this small reduction would have such a dramatic impact on these programs. Why can't this small reduction be absorbed by eliminating low value programs and activities?

Response. A reduction of \$17.8 million represents a challenging reduction for the agency to absorb. The NRC budget has been declining over the past several years. As measured in constant fiscal year 1993 dollars, the NRC budget has been reduced over 20 percent through fiscal year 1998, from \$540 million to \$422 million. The \$17.8 million reduction is amplified by the need to absorb a higher than budgeted Federal pay raise, unbudgeted costs in carrying out personnel reductions, and Commission decisions since the budget was submitted to add resources in areas such as control of orphan sources, speeding licensing reviews, development of a recycle rule, dry cask storage reviews, preparation for an AVLIS enrichment plant application, etc. The NRC budget has little flexibility, and reductions in funding result in program and support activities being deferred. Reductions were indeed focused on lower priority activities.

ANSWER OF COMMISSIONER DIAZ

In my view the NRC can improve its processes to ensure that no reduction in adequate protection of public health and safety results if these reductions are effected. Even with the contemplated reduction, planned programmatic changes and improved processes can still assure adequate protection.

Question 22. (A) On page A-15, you state that the Commission has approved the development of guidelines for applying Safety Goals and their subsidiary objectives in plant-specific regulatory activities. When will the safety goal policy be applied to the regulations on a generic basis?

Response. The Commission's Safety Goal Policy Statement was issued in 1986. As indicated therein, and in the Commission's June 15, 1990 Staff requirements Memorandum, the original intended use was for examination of regulations and other generic matters, and not for making plant-specific decisions. The staff presently does apply safety goal considerations in the regulatory analyses conducted on all proposed reactor rulemakings or generic requirements. This requirement is documented in NUREG/BR-0058, Rev. 2, "Regulatory Analysis Guidelines of the U.S. Nuclear Regulatory Commission" issued in November 1995. However, many of the Commission's regulations were in place prior to issuance of the Safety Goal Policy and, therefore, were not assessed in light of that policy. Accordingly, the NRC is currently considering options for reviewing all reactor regulations with respect to their safety significance (considering factors such as the Safety Goal Policy) and will decide in the near future on a course of action.

Question 22. (B) Why is this activity limited to just plant-specific regulatory actions and not the regulations themselves?

Response. The Commission's Regulatory Analysis Guidelines already require consideration of Safety Goals in imposing new generic requirements, including changes in regulations. The development of new guidelines referenced on page A-15 refers to extending the existing policy on a plant-specific basis. As discussed in the response to Question 22(A), the Commission is considering options for assessing all reactor regulations with respect to their safety significance.

Question 23. (A) In your oral testimony, you stated that you have asked the industry to submit rulemaking petitions to make reactor regulations risk-informed. Why, when the NRC is responsible under the Atomic Energy Act for promulgating requirements to establish adequate protection, do you think this is the industry's responsibility?

Response. The NRC is responsible for promulgating requirements for adequate protection, and the existing requirements are sufficient for this purpose. The NRC does not rely on rulemaking petitions to initiate rulemaking. However, we operate in an open forum and always encourage public, including industry, input to our processes. From the perspective of nuclear safety, it is vital that licensees of nuclear power plants play a large and integral role in the development of safety requirements because licensees have prime responsibility for ensuring the safe design, construction and operation of their facilities. From the perspective of regulatory policy, it is vital that the NRC seek the views of all stakeholders that will be affected by new requirements. One consequence of not doing this in an effective way with respect to the nuclear industry can include a drawn out rulemaking process due to a protracted dialogue over numerous technical and process issues or resultant requirements that are overly prescriptive and burdensome. Lessons learned from previous rulemaking activities indicate that soliciting rulemaking petitions from our stakeholders provides an important opportunity to consider and understand stakeholder priorities and help ensure the efficient use of both industry and NRC resources.

Question 23. (B) What effort is underway within the NRC to identify regulations that can be made risk-informed and changed by the agency?

Response. The agency is currently in the process of revising the event reporting requirements for nuclear power reactors contained in 10 CFR 50.72 and 50.73 (1) to reduce or eliminate the reporting burden associated with events of little or no safety significance, and (2) to better align the rules with the NRC's current needs, including (a) revising reporting requirements based on importance to risk and (b) extending the required reporting times consistent with the need for prompt NRC action. The NRC has requested public, including industry, comments on these rules and any other reporting requirements that can be risk-informed or simplified. An advance notice of proposed rulemaking was published in the Federal Register on July 23, 1998. A public meeting on the subject was held on August 21, 1998. The proposed rule is scheduled to be published on April 2, 1999, and the final rule is scheduled to be published on January 7, 2000.

In addition, we have initiated rulemaking to revise rules on source terms; maintenance; and changes, tests, and experiments (10 CFR 50.59).

We also plan to institute an interoffice review which will take a fresh look at items including the NRC regulations, and will also consider the results from the NEI Whole Plant Pilot initiative and recommendations from the Center for Strategic and International Studies project to assess the NRC's efforts to improve its reactor regulatory process. The staff is preparing an options paper for Commission decision on modifying Part 50 to be risk-informed.

Question 24. (A) On page A-16, you state that each of the pilot risk applications (inservice inspection, inservice testing, graded QA and technical specifications) have proven successful at specific power reactor licensees. As of the date of the hearing, how many plants in each area have received approval by the NRC to apply the approach?

Response. One plant (the South Texas Project, the pilot plant) has received approval for their graded QA program, and four plants (San Onofre Nuclear Generating Station, the South Texas Project, Fitzpatrick, and Fermi 2) have received risk-informed technical specifications amendments. In addition, the Commanche Peak inservice testing pilot review has been completed since the hearing date. Several pilot applications for risk-informed inservice inspection are in an advanced state of review and are scheduled for completion by January 1999.

Question 24. (B) What is your measure of "success"?

Response. The NRC considers the pilot activities to be successful when they resolve significant technical and process issues that would otherwise be an issue in the review of each subsequent plant specific submittals. Pilot reviews provide licensees with "up front" guidance for planning and preparing proposals to the NRC and allow the NRC an opportunity to improve the efficiency of its review procedures. Pilot activities are considered to be complete when the NRC takes a formal action with respect to the pilot proposal such as issuance of a license amendment, promulgation of a new or revised requirement, or acceptance of a program or process via completion of an inspection. The ultimate success of the pilot activities will be measured by how the industry and NRC apply lessons learned to improve the regulatory processes, to reduce unnecessary burden and review time for future risk-informed submittals, and to proceed more rapidly toward more risk-informed, performance-based regulatory approaches.

Question 24. (C) Does the industry agree that these pilot applications were successful?

Response. Several industry representatives have expressed dissatisfaction publicly with aspects of the pilot applications. Industry concerns have, in general, been associated with the extended duration, the level of detailed information, and the resources necessary to support the pilot activities. One licensee, after completing a graded quality assurance pilot application, expressed concerns that they were unable to realize the expected implementation benefits, in part, because of other regulatory requirements. The NRC will continue to solicit feedback of the effectiveness of both our pilot activities and our transition to more risk-informed and performance-based approaches. While we recognize the industry dissatisfaction with some of the pilot activities, we continue to believe that the ultimate success of the pilot activities will be measured by how the industry and NRC apply lessons learned to improve the regulatory processes, to reduce unnecessary burden and review time for future risk-informed submittals, and to proceed more rapidly toward more risk-informed, performance-based regulatory approaches.

Question 25. (A) Why did the pilot risk applications take 4 to 6 years to complete when no rulemaking activity was required?

Response. Although the pilot activities did not culminate in promulgation of requirements, they have been linked with the development of new NRC procedures and policies, and industry guidance documents which required resolution of a number of complex and difficult technical issues applicable to all risk-informed licensing reviews. The most significant issues include: (1) developing a risk-informed framework and acceptance guidelines that could be applied in plant specific licensing decisions, including the pilot applications; (2) defining and articulating the scope and quality of a PRA being used to support a licensing proposal; and (3) developing a practical approach to address uncertainty in PRAs. The process for resolving these issues included the development of candidate resolutions through recommendations by the NRC staff, review and consideration of the various options by the Commission and its independent advisory groups, and review and comment by the public. As regulatory positions were being established through this process, licensees were asked to supplement their original pilot risk proposals with information to address these positions. Although this process has been time consuming, and at times inefficient, the NRC staff believes that it was necessary to ensure a coherent and predictable process for conducting licensing reviews that satisfy all of the objectives of the Commission's policy statement on the use of PRA (i.e., to enhance the process for making safety decisions, to make more efficient use of agency resources, and to remove unnecessary burdens on licensees).

Clearly, future reviews of risk-informed licensing actions will have to be more timely than the pilot applications were. The NRC has committed to several actions to expedite the review process by increasing the priority for risk-informed licensing action reviews. Allocation of staff resources will be based on potential safety benefits of the action, and on potential savings of staff and licensee resources. In addition, a lead project manager (PM) for the coordination of risk-informed, performance-based licensing actions has been identified. This lead PM will identify, monitor, and coordinate risk-informed licensing actions; keep track of the review schedules; help identify problems that may require management attention; and coordinate followup actions (if any). Also, the management oversight steering committee on PRA has been reestablished to provide policy, technical, and priority guidance on risk-informed regulation; the committee consists of the NRC Office Directors from the Office of Nuclear Reactor Regulation, the Office of Nuclear Regulatory Research, the Office of Analysis and Evaluation of Operational Data, and the Office of Nuclear Material Safety and Safeguards. Finally, a risk-informed licensing panel is assisting in focusing management attention, as necessary, on risk-informed licensing actions.

Question 25. (B) What incentives are there for the industry to propose risk-informed changes to the regulations themselves given this track record?

Response. NRC discussions with the industry indicate that the industry sees risk-informed initiatives as a viable approach to reducing costs and regulatory burdens while maintaining or even improving safety. The Commission's PRA Policy Statement, staff training, and activities to develop guidance on using risk-informed approaches have all served to make the increased use of risk information in the regulatory process a reality. In addition, the management oversight steering committee on PRA will help ensure a more disciplined, timely process by providing policy, technical, and priority guidance on risk-informed regulation. The NRC is now in a position to work efficiently and effectively with the industry to approve risk-informed

applications which enhance or maintain safety while reducing unnecessary regulatory burden.

Question 26. On page A-18, you state that the NRC has revised guidance for reactor inspection activities to incorporate risk insights and to be more performance-based. When were these improvements promulgated? What results have you seen?

Response. Inspection Manual Chapter 2515 "Light Water Reactor Inspection Program Operations Phase" Appendix C "Use of Insights Derived from Probabilistic Risk Assessment (PRA)" was revised and reissued in September 1997 as improved implementation guidance for inspectors. More than 2 years prior, when it was first determined that new inspector guidance was needed, it was also determined that this guidance alone would not be sufficient to effect a significant change in the way the inspection program was conducted. Therefore, the approach taken was four-pronged: 1) revise the inspection manual guidance, 2) expand the application-oriented PRA training designed specifically for the inspector (2 weeks in length), 3) train and qualify ten experienced inspectors (Senior Reactor Analysts) in advanced PRA techniques and locate two SRAs in each regional office and two at headquarters, and 4) require a 3-day PRA training course directed toward all NRC technical managers and supervisors. To date, 1) inspection guidance has been issued, 2) inspector training commenced in January 1998, and with one class scheduled each quarter we are on track to have at least one resident inspector so trained at each reactor site by the end of fiscal year 1998, 3) all SRA positions have been filled and only two SRAs remain in training, and 4) training for two-thirds of the managers and supervisors is expected to be complete by the end of fiscal year 1998 with the remainder complete by the end of fiscal year 1999. Insufficient time has passed to directly measure results from these efforts in the day-to-day conduct of the inspection program. Our expectation is that as more people are trained, the published implementation guidance will be more effectively implemented. Furthermore, we are currently planning to restructure the inspection program on a more risk-informed basis in 1999 to more quickly achieve a risk-informed focus of our inspections.

However, results to date have been achieved predominantly through the activities of the SRAs. These individuals are actively involved in regional assessments of the significance of operating events and proposed enforcement actions, in providing plant-specific risk insights during the various integrated performance review processes, in providing advice and expertise to assist other regional inspectors with inspection planning and, when necessary, leading inspection teams.

Question 27. On page A-19, you state that core inspections are performed at all sites, independent of licensee safety performance. What considerations have you given to reducing core inspections for plants with good performance by relying more on self-assessments and audits performed by these licensees?

Response. The core inspection program is the minimum inspection effort that is performed at a site to confirm licensee performance and identify potential problems in the early stages. When an event or issue requires additional inspection to the core inspection program, regional initiative inspection is performed in those functional areas where licensee performance has been rated as not meeting Systematic Assessment of Licensee Performance (SALP) of 1 (the highest rating for a good performing licensee). Regional management may recognize a licensee's good performance and self-assessment capability by reducing the scope of NRC inspection effort for regional initiatives. Since the core program is the minimum inspection effort performed by NRC at good performing licensees, reduction of inspection effort for licensee self-assessment for the core is not currently allowed. Recently, the NRC formed a task force to redefine the core inspection program, with the goal of making it more effective, efficient, and risk-informed. This effort is being conducted together with a similar effort regarding the NRC's plant performance assessment process. Both of these efforts will define what plant performance indicators are important from a risk perspective and where such performance data can be obtained. Performance indicators and/or licensee self-assessment data will be used in determining the level of NRC inspection activity.

Question 28. (A) On page A-20, you state that there was an "across the industry" decline in attention to maintaining the facility design basis. If this is so, why did you stop your A/E inspections?

Response. In 1997 and 1998 the NRC performed A/E inspections at 20 facilities. These facilities were selected for inspection based upon several factors including the age of the facility, probabilistic insights, problem plant status, performance in the engineering area, and the licensee response to the agency's 50.54(f) letter on adequacy and availability of design bases information. This letter had been sent in October 1996 to all plants after design basis issues had arisen at Millstone, Maine

Yankee, Haddam Neck and Crystal River. Selections were also made to assess engineering at plants where Regions had concerns regarding engineering performance. Based on the selection process, 20 facilities were selected where NRC had potential concerns about design basis issues. From these 20 inspections, the NRC gained a general understanding of the extent and safety significance of design basis issues across the industry. This was documented for the initial 16 inspections in Information Notice 98-22, "Deficiencies Identified During NRC Design Inspections." The inspections were stopped because the program had fulfilled its objectives of (1) ensuring the safety of those facilities where design basis issues were of potential concern and (2) providing the NRC generic information from which decisions could be made on the need for future regulatory action in this area and because the body of the results from the A/E inspections did not establish an across-the-industry decline in attention to, or maintenance of, the facility design basis. The NRC does recognize that the lack of completeness and availability of design basis information is not necessarily equivalent to design safety issues.

While the resource-intensive A/E inspections were terminated, the NRC plans to continue inspections of design basis issues as resources permit at other plants identified by NRC reviews of licensee responses to the October 1996 50.54(f) letter. While the 20 A/E inspections addressed the highest priority plants, the remaining design basis inspections will utilize a less intrusive inspection procedure, IP 93809, "Safety System Engineering Inspection," which was developed in response to the design bases concerns. Since the mid 1980's, the NRC has conducted various types of safety system design basis inspections such as Safety System Functional Inspections, Electrical Distribution System Functional Inspections, and Service Water System Operational Performance Inspections. These inspections have focused on the adequacy of safety system designs and conformance of the facility with the design basis. The A/E inspections were not a new concept but represented a short time increase in focus of the design area.

CHAIRMAN JACKSON'S ADDITIONAL STATEMENT

I support the staff view that there had been a general decline in attention to facility design and licensing bases. As a result of the A/E inspections and licensees' responses to the 10 CFR 50.54(f) letter, licensees appeared to have appropriately focused attention on maintaining facility design bases. Therefore, the A/E inspections accomplished their objectives, and were replaced by a less intrusive inspection: "Safety System Engineering Inspection."

Question 28. (B) What was the safety significance of this lack of attention at a typical facility? If the safety significance of design basis deficiencies was low, what does this tell you about the safety focus of your requirements?

Response. Of the initial 12 A/E inspections, one plant (D.C. Cook) elected to shut down two operating units because of concerns identified during the inspection. Four other plants (TMI, Perry, H. B. Robinson, and Vermont Yankee) were issued Notices of Violation at a Severity Level I. These significant violations were issued because of the lack of assurance that safety systems were able to perform their intended functions under certain conditions. For more recent A/E inspections, there have been some inspection findings that appear to represent similar inadequacies relative to the ability of systems to perform their intended safety functions. These findings are currently being evaluated in accordance with the enforcement process. For some recent inspections licensees have self-identified equally significant problems on their own prior to the inspection. These A/E inspections showed that the industry, with the noted exceptions, did not have serious safety problems as a result of design-basis issues. While the inspections did identify the need for additional definition, documentation and compliance, adequate protection of public health and safety was not compromised. Given these findings, the NRC staff believes the safety focus of our requirements was appropriate.

CHAIRMAN JACKSON'S ADDITIONAL STATEMENT

While it is true that the majority of A/E team inspections did not identify significant safety problems at the facilities inspected, the significance of the errors identified at D.C. Cook, Three Mile Island, H.B. Robinson, Perry, and Vermont Yankee indicate the importance of maintaining design basis information, and the configuration of a given facility, up-to-date and accurate. Further, the results of the A/E team inspections relate only to the specific population of facilities inspected, not the industry as a whole. Significant design basis issues have been identified, both by NRC and licensees, outside of the A/E team inspection process. Examples include design

and licensing basis issues at Crystal River 3, Millstone, Haddam Neck, and Maine Yankee.

Question 29. In response to an oral question regarding the Tim Martin Associates study, you indicated that comparisons between NRC staffing levels per reactor to levels for other countries could not be made because other countries use manpower from external sources to augment their program. Your fiscal year 1999 budget estimate shows that 40 percent of your budget is for contractor support.

(B) Do you plan to conduct any studies of foreign regulatory programs to determine how consistent your ratios are with theirs? If not, why not?

Response. The unavailability of, and disparities in, data concerning key elements of foreign regulatory processes make it extremely challenging to develop reliable information which would yield practical insights for assessing whether NRC's regulatory approach requires disproportionate resources compared to foreign countries. However, we are in the process of trying to develop a comparison and will provide it to the Committee.

Question 29a. In response to an oral question regarding the Tim Martin Associates study, you indicated that comparisons between NRC staffing levels per reactor to levels for other countries could not be made because other countries use manpower from external sources to augment their program. Your fiscal year 1999 budget estimate shows that 40 percent of your budget is for contractor support. How many contractor FTEs are included in this amount?

Response. The NRC uses contractor support in areas where it is economically beneficial. This includes using contractors to provide expertise where it does not exist within the NRC and would not be cost beneficial to hire staff with the expertise. These services procured through contracts include areas such as administrative support, information technology systems support, and technical and scientific analysis. It is estimated that in fiscal year 1999, the NRC budget would support approximately 850-900 contractor employees. This reflects the number of people performing work supported by NRC's contractor support funding. This figure should be viewed as an estimate of the level of effort involved with NRC activities at any one time, although there is considerable movement within the mix of activities and individuals. Civil servant staffing levels are estimated across the government as full-time equivalents (FTE) based on a standard calculation of available hours to be worked. It cannot be assumed that an agency's FTE level represents the number of people on the payroll at any time.

Question 30. What steps does the Commission intend to take to ensure that licensing proceedings, like the license transfer proceeding associated with the sale of TMI Unit 1, remain focused only on issues directly pertinent to the subject of the proceeding (e.g., in the case of the TMI Unit 1 sale, the technical and financial qualifications of the prospective owner/operator)?

Response. The Commission has been engaged in an ongoing process to streamline licensing proceedings including those associated with license transfers. In connection with license transfers, the Commission's regulations require consideration of the technical and financial qualifications of the proposed transferee to the extent appropriate to the authority being sought in the transfer application; a review of anti-trust matters may also be needed. Among the more important matters, the staff reviews the financial qualifications and decommissioning funding assurance provisions made by the proposed transferee. In this regard, a Standard Review Plan (SRP) on Power Reactor Licensee Financial Qualifications and Decommissioning Funding Assurance reviews, now before the Commission, provides a plan of action for how the NRC staff will evaluate, among other areas, license transfer requests under 10 CFR 50.80, with focus on the issues of (1) transferee's financial qualifications and (2) methods by which the transferee will provide decommissioning funding assurance acceptable to the NRC. By adhering to the SRP, the staff's review should remain focused on issues directly pertinent to the evaluation of the technical and financial qualifications of the prospective owner/operator.

The NRC has received and processed about 45 license transfer requests over the past 5 years. Depending on the accuracy and completeness of the transferee's application, the NRC staff has typically completed its review of the financial qualifications and decommissioning funding assurance aspects of the proposed transfer within 2 months of receipt of the application. With environmental assessment notices and preparation and execution of orders approving the transfer, the total approval process typically takes about 3 months. However, atypical applications may take longer, particularly if unusual issues of antitrust or foreign ownership, domination, or control are involved. There is also the possibility that a hearing request filed by an intervenor could extend the overall process, although the Commission, in 15392,

determined a hearing need not be held prior to action on the transfer application itself once the staff has otherwise completed its review of the application.

The SRP also generally addresses reviews required under the Atomic Energy Act of 1954, as amended (AEA), to determine whether proposed transferees are owned, dominated, or controlled by foreign entities. However, because foreign ownership issues are case-specific and because there remain difficult policy and legal issues that are contingent on the specifics of each transfer application, the NRC intends to evaluate this issue as specific transfer requests are submitted. The staff is also preparing an SRP to address foreign ownership issues.

In addition, the NRC issued a final SRP on Antitrust Reviews in December 1997, which contains a detailed description of the review process of the antitrust concerns that the NRC is required to evaluate under Section 105 of the AEA. In the NRC's license transfer reviews, antitrust considerations have not been a significant issue. Nevertheless, because of the requirements in the AEA for coordination with the Department of Justice, the potential remains for an uncontested "significant change" antitrust review to take 9 months or more. An antitrust review contested by interveners may well take longer. In the specific case of the TMI Unit 1 sale, the facility has a license issued under Section 104b of the AEA, and is grandfathered from antitrust reviews.

The NRC staff is also developing a plan of action and milestone schedule for those future transfer requests that involve previously unevaluated technical qualifications issues or which involve transfers to non-owner operators.

Finally, on September 11, 1998, the Commission published in the Federal Register for a 30-day comment period a proposed rule that would establish new, informal procedures for license transfer hearings that, if promulgated as a final rule, could, in general, substantially reduce the time for such hearings. The Commission has also expressed its support for legislation which would remove the Commission's role in antitrust reviews (part of the President's electric utility restructuring legislation) and for legislation which would repeal the foreign ownership and control provisions of sections 103b and 104b of the Atomic Energy Act for utilization facilities.

Question 31. The Federal Energy Regulatory Commission recently completed a four month study to evaluate ways to streamline the agency's activities to more effectively address the needs of the industries it regulates. FERC announced that it will implement improvements identified in the study including (1) bench marking FERC activities; (2) promoting competitive markets through a pre-filing process to reduce agency processing time; (3) implementing collaborative pre-filing procedures to achieve earlier resolution of issues and more timely decisions; and (4) establishing a structure for gathering and considering proposals for policy changes. On their face, these are innovative approaches some of which could be adopted by the NRC.

(A) What actions will the NRC take to develop way to reduce processing staff time, to engage in more collaborative activity with the industry, and to implement more efficient methods to accomplish the agency's regulatory mission?

Response. During a licensing workshop with the industry on July 20 and 21, 1998, the NRC staff discussed the possibility for using collaborative pre-filing procedures to achieve earlier resolution of issues and more timely decisions. The NRC staff has committed to work further with the industry to evaluate means of implementing a number of concepts discussed at the workshop to improve process efficiency. In developing a collaborative pre-filing process, the NRC staff remains sensitive to the need to ensure a process that is open and accessible to the public.

In addition, the Commission encourages the industry to work together to develop collaborative solutions to issues that affect large groups of facilities. Such collaboration has been accomplished through the Nuclear Energy Institute, the Electric Power Research Institute, vendor owners' groups and other ad hoc organizations. Such collaborative efforts on the part of industry have proven effective in resolving significant issues while reducing resource allocations for both the industry and the NRC staff.

The NRC has been interacting with its stakeholders through its public meeting process, and has increased the frequency of its public meetings with its stakeholders, including the industry. The NRC has asked the Nuclear Energy Institute to provide proposed rulemakings in areas believed by industry to be in need of regulatory reform and has committed to give a high priority to these areas. One example area where there is priority attention given industry concerns is the acceleration of the implementation of risk-informed and performance-based regulation. Another is licensing and rulemaking of dual-purpose casks for spent fuel.

The NRC is using its Strategic Assessment and Rebaselining process as a basis for its self-assessment processes and for the implementation of more efficient methods for accomplishing the agency's regulatory mission. Reorganizations are being

implemented which will streamline the operation of the offices and realign and consolidate office functions. The Operating Plans for each office are being used to benchmark performance, and these are updated on a quarterly basis.

To reduce processing staff time, NMSS is using or developing standard review plans (SRPs). Management is strengthening its oversight of staffs implementation of these plans to ensure that issues are pertinent and are not overly conservative. In addition to documenting application deficiencies, NMSS is now meeting with applicants to ensure that both parties have a clear understanding of what NMSS seeks. NMSS' immediate goal is to have no more than two rounds of questions on an application; NMSS' long term goal is to make guidance and SRPs sufficiently clear that application submittals will be acceptable without additional questions.

NMSS is already engaged in collaborative activity with industry and with the Department of Energy. For example, NMSS has involved industry representatives and NEI in the development of the new medical rule, 10 CFR Part 35, and in the revision to the fuel cycle facilities rule, 10 CFR Part 70. In the waste management area, NMSS meets extensively with licensees, other Federal agencies, and the public. More specifically, NMSS has worked extensively with DOE for more than a decade to ensure that both agencies have a common understanding of the requirements and information being developed for licensing a high-level waste repository.

NMSS is actively implementing more efficient methods to accomplish the agency's regulatory mission through activities such as continued expansion of the electronic process for material license application submittal, review, and evaluation; and consolidation and updating of guidance documents. As mentioned above, NMSS is increasing the use of meetings with licensees and applicants to supplement written communications. Experience is showing that these meetings significantly increase the efficiency of NMSS interactions with the licensee community.

The Commission has moved to streamline the adjudicatory process, while still ensuring that a fair hearing is conducted and a clear and complete record is created. The Commission has commenced a study of the entire hearing process and expects to receive staff recommendations by the end of this year on specific changes that would make NRC proceedings more efficient and timely. The Commission expects that this study will specifically address the question of need for legislation to streamline the hearing process as well as the viability of rulemaking, without legislation, to streamline that process.

In the interim, the Commission has developed and issued a "Statement of Policy on Conduct of Adjudicatory Proceedings" which provides guidance to the licensing boards and parties to Commission proceedings on how the Commission expects its proceedings to be conducted. The Policy Statement encourages licensing boards to establish and adhere to case-specific schedules, to shorten filing and response times where practical, to manage discovery to avoid unnecessary delays in that stage of the adjudicatory process, to make sure that the parties comply with the Commission's regulations governing the submission of admissible contentions, and to issue decisions in a timely manner. The Statement further makes it clear that the Commission itself will carefully and actively monitor ongoing licensing proceedings to ensure that they are conducted expeditiously and that the boards, staff and other parties receive prompt guidance on emerging technical, policy and legal issues, as necessary.

Consistent with the desire for expeditious processing of licensing actions, the Commission on August 19, 1998, issued an order giving guidance and recommending a schedule to the Licensing board that will preside over the licensing renewal proceeding for the Calvert Cliffs Nuclear Power Plant and a similar order on September 15, 1998 for the Oconee license renewal proceeding.

The Commission has also published for comment a proposed rule that would establish new, informal procedures for license transfer hearings that, if promulgated as a final rule, could, in general, substantially reduce the time for such hearings.

Finally, the Commission has directed the staff to seek legislation that supports the NRC's reading of section 189a of the Atomic Energy Act to reflect the reading that formal adjudications are not required. Further, with the anticipated application from USEC for the AVLIS uranium enrichment process expected early next year, the NRC will consider seeking legislation that would modify section 193's inflexible approach to hearings.

Question 31. (B) Does the Commission have any plans to implement a benchmarking process? If so, please provide the schedule for implementation.

Response. The NRC has contracted with Arthur Andersen and Company to (1) conduct an assessment of the Office of Nuclear Reactor Regulation programs and activities to ensure that they are derived in response to strategic goals and that they achieve their intended purpose in an effective and efficient manner, and (2)

evaluate the NRC's current practices for developing and executing its planning, operating plan, budgeting, program assessment and performance measures and monitoring practices and processes. As part of the assessment, Arthur Andersen and Company will evaluate how NRC performs these activities in recognition of best practices in both the public and private sectors. The NRC also plans to initiate, in fiscal year 1999, an evaluation of its support activities using an experienced contractor (e.g., Arthur Andersen and Company). This task will also include a comparison of NRC's support activities to the best practices in both the public and private sectors. Additionally, the NRC consulted with the Federal Aviation Administration and the Department of Transportation to gain information on other Federal agency program effectiveness.

Question 32. Many past reviews point out consistent problems with the NRC's regulations and administration of the regulatory system. These reviews include the Kemeny Report (1979), the Rogovin Report (1980), the Regulatory Impact Surveys (1981; 1989), the National Academy of Science report (1992), the Regulatory Review Task Force Briefing (1994), and the Towers Perrin Report (1994). Most recently, members of the industry and public expressed their ongoing concerns at the July 17, 1998 stakeholders meeting sponsored by the Commission. Criticism of the NRC common to the reviews include: the NRC's highly prescriptive regulation/lack of performance-based regulation; the failure to focus NRC resources on higher priority safety-related issues; the pervasive subjectivity in NRC regulatory decisions and processes; the failure to exercise adequate management control and oversight of NRC staff; the significant overlap and duplication of roles and responsibilities within the NRC; and the intrusiveness of NRC regulatory processes that add little to the safety margin of nuclear plants. We are concerned that these problems were identified almost two decades ago and still have not been effectively addressed.

(A) What action will the Commission take to ensure that these long standing problems will be permanently corrected?

(B) Please describe each action or activity designed to address the problems identified above and their expected date of completion.

Response. Since the early 1990's, the NRC has initiated programs and processes that have, as a principal goal, reviewed our current regulatory requirements to determine whether they can be modified or eliminated to improve safety, reduce unnecessary licensee burden, or improve staff efficiency. Included among these efforts were the National Performance Review for all areas, the Regulatory Review Group for reactor-related areas and the Business Process Reengineering process for materials-related areas. These efforts and others would show that NRC has attempted to address a number of industry concerns. However, we did not progress to the extent we had hoped in improving our regulatory processes and programs. Currently, we are trying to learn from the mistakes in the past and establish processes that are scrutable and adequately balance safety and concerns about unnecessary regulatory burden.

While not all of the issues or problems in each of the reports in the question have been resolved, much work has been done. Many of the actions described in responses to these and other Congressional questions are actions that were initiated prior to the July 30, 1998 Authorization hearing. However, these same responses show that change is needed and that much effort remains.

The Chairman, on behalf of the Commission, has issued an August 7, 1998 memorandum to the Executive Director for Operations raising concerns about several issues: the predictability, objectivity, and timeliness of NRC decisions; the focus of NRC activities; the quality of NRC licensee interactions; the implementation of NRC programs; and the size of the NRC staff. The Executive Director for Operations in an August 25, 1998 memorandum replied to the concerns and described a number of issues that need to be resolved with corresponding milestones and dates for when the actions are to be completed. This "plan" for improving regulatory processes and programs is considered to be a living document and will be updated on a periodic basis. We recognize we need to improve, and we are aggressively seeking solutions to these and other concerns and will continue to look for ways to improve NRC's performance.

Question 33. For the past 3 years, the Chairman has provided the other Commissioners Staff papers and other information only after the Chairman reviewed the papers and/or information and changes requested by the Chairman have been made. This appears to be contrary to Congress's deliberate decision in the Energy Reorganization Act to create a Commission rather than a single administrator to establish the NRC policies.

(A) How does this approach advance the Commission's ability to manage the NRC in a timely and efficient manner?

(B) What action will be taken to ensure that each Commissioner is fully informed about agency policy matters without first being filtered through the Chairman's office?

ANSWER OF CHAIRMAN JACKSON

It is true that the Energy Reorganization Act of 1974 created the Nuclear Regulatory Commission (NRC) and the commission format to establish NRC Policies. As Chairman I have worked to fully comply with the statutes underlying the NRC. In order to do so I believe it is important to recognize that Reorganization Plan No. 1, passed by Congress in 1980 (1980 Plan) made changes to the organizational structure established by the Act of 1974.

The 1980 plan states under section 2 (b) of the Plan, "[t]he Chairman . . . shall be responsible to the Commission for *developing 'policy planning and guidance for consideration by the Commission.'*" (Emphasis added.) The House Report 96-1043 leading up to the Plan at page 4 states: "without a central authority to focus agency objectives, Commissioners have been able to follow individual interests without the appropriate coordination required in the development of policy." The Senate Report 96-790 leading up to the Plan at page 13 notes that "[t]he amendments [to the Plan] will free him [the Chairman] to be the chief architect of NRC policy and the focal point for development of consensus on the demanding and highly complex issues considered by the Commission." Thus, the review of draft papers allowed the Chairman to carry out the function of *developing* policy guidance before it was presented to the Commission for consideration, as the central authority to focus agency objectives and as the chief architect of policy, as Congress intended. The intent of this approach was to ensure that all policy options were considered and assessed for the Commission. The review by the Chairman did, in some cases, result in the addition of policy options. However, there were no reviews which resulted in changes which eliminated options presented by the staff. The approach in no way precluded the Commission from having "equal responsibility and authority" in the decision the Commission made on the paper, nor was it intended to stifle the flow of information to the Commissioners. In fact the process was intended to enhance the Commission policy review and consideration. See Energy Reorganization Act of 1974, section 201 (a)(1).

The Commission has recently reexamined the approach for policy development and determined that modifications were needed. Effective June 30, 1998, the Commission approved revised internal Commission procedures that are being implemented which state:

"The Chairman and the Executive Director for Operations, through the Chairman, are responsible for ensuring that the Commission is fully and currently informed about matters within its functions (Id., Section 2(c)) [of the Reorganization Plan No. 1 of 1980]. The Chairman shall ensure *prompt and full delivery of original information* with any changes thereto, including draft SECYs and COMs, except preliminary information for development of Section 2(b) [of the Reorganization Plan No. 1 of 1980] proposals and estimates [i.e., proposals for reorganization of the major offices within the Commission, the budget estimate for the Commission, and the proposed distribution of appropriated funds according to major programs and purposes] unless expressly requested by the Commission. The Executive Director for Operations reports for all matters to the Chairman (Id.; Section 4(b)) [of the Plan]." (Emphasis added.) NRC Internal Commission Procedures at p. 1-5.

To clarify the papers (i.e., SECYs and COMs) mentioned in the above reference, the primary decision-making tool of the collegial Commission is the written issue paper submitted by the staff and is best known as a SECY paper. The Commission also receives memoranda from the staff, and at times a staff memorandum may contain a recommendation or seek guidance from the Commission. This type of memorandum is known as a COM. See NRC Internal Commission Procedures at p. II-1.

ANSWER OF COMMISSIONER DIAZ

This question appears to call principally for a response from the Chairman. Chairman Jackson is providing her individual response on her intent and past practice regarding the transmission of NRC staff papers and/or information to the other Commissioners after her review and the execution of her requested changes. Thus, I am not in a position to comment fully or endorse the Chairman's response. I provide this separate response as an individual Commissioner. As the question indicates, the flow of information to the full Commission is closely related to the Congressional decision to establish a collegial decision-making body rather than a single administrator. In creating a multi-member body, with staggered terms and diverse

party affiliation, Congress has provided the necessary checks and balances for decision-making. The collegial decision-making structure promotes full and fair consideration of complex nuclear issues and thus addresses sensitive public concern regarding the use of nuclear energy. The free flow of information to the Commission has long been understood to be critical to the Commission's deliberative function. The principle of full access to information for each Commissioner has been a part of nuclear regulation since 1955. The Energy Reorganization Act of 1974 continued to provide that each member of the Commission "shall have full access to information relating to the performance of his duties or responsibilities" and Reorganization Plan No. 1 of 1980 charges that "[t]he Chairman, and the Executive Director for Operations, through the Chairman, shall be responsible for insuring that the Commission is fully and currently informed about matters within its functions." These statutory directives provide important underpinnings for an effective Commission. Unless the Commissioners are fully and currently informed, they cannot properly exercise their responsibility for policy formulation (including management policy), most rulemaking, and oversight of the agency. The full Commission's access to the staff's independent and sometimes diverse views allows for better-informed Commission decisions. It also enhances the ability of each Commissioner to articulate and consider differing positions and makes more transparent to the Commission the Chairman's actions in the performance of her functions. Therefore, I have requested and supported actions that would assure the sharing of the staff's papers and analyses with the full Commission when such information is made available to the Chairman. By its revisions to the Internal Commission Procedures, the Commission took steps to return to the status quo ante so as to ensure that each Commissioner is fully and currently informed and fully able to discharge his or her duties. As a consequence of adherence to these procedures, the public will have the benefit of assurances of adequate protection resulting from the diversity of judgment that is expected of this collegial body. The revised Internal Commission Procedures actually enhance the Chairman's ability to discharge the Chairman's responsibility "to the Commission for developing policy planning and guidance for consideration by the Commission" in accordance with section 2(b) of Reorganization Plan No. 1 of 1980. The legislative history of Reorganization Plan No. 1 of 1980 quite plainly expresses the Congressional intent that the Chairman's coordinating role does not justify delay in transmitting information forwarded by the staff as information relating to the Commission's functions. See, *ma.*, S. Rep. 96-790, 96th Cong., 2d Sess. at 7-9, 18, 1920 (1980). While the Chairman and the NRC staff need not share administrative details on a daily basis or preliminary development of budgetary and reorganization proposals for the Commission's consideration unless specifically requested by the Commission, transparency in the broader development of non-routine matters of policy assists the Chairman and the staff in keeping the Commission fully and currently informed and helps avoid oscillations in policy setting and regulation. Therefore, as Congress intended, the agency and each Commissioner best discharge their responsibility to the country when all Commissioners have early and complete knowledge of key policy issues and proposals.

ANSWER OF COMMISSIONER MCGAFFIGAN

I was concerned with the Chairman's prior review of staff papers before they were submitted to the Commission. For that reason I supported the revision to Commission procedures which was finalized on June 30, 1998. Under the new procedures staff papers will be submitted to the Chairman and all Commissioners simultaneously. This process appears to be working well in its first 3 months and has enhanced dialogue on policy matters between the staff and the Commission as a whole.

Under the revised Commission procedures, each Commissioner should be informed about agency policy matters directly by the staff without filtering through the Chairman's office. However, the Reorganization Plan of 1980 gives the Chairman primacy in certain matters, for example, presentation of proposed budgets for the Commission, presentation of proposals for reorganization of major offices, serving as official spokesperson for the Commission, etc. In these areas, the Chairman by statute serves as a filter to the Commission. The goal of the collegial Commission process is to ensure, even in these cases, that the Commission is fully and currently informed. In the case of budget preparation, for example, the Chairman in my 2 years on the Commission has taken by all reports unprecedented steps to make transparent both her proposal and various scenarios that are options to modify her proposal. I have been very satisfied with the Chairman's efforts to ensure Commissioners are fully informed in budget matters and her willingness to make further incremental improvements in the budget preparation process.

Question 34. We understand that at the stakeholders meeting held on July 18, 1998, that you alluded to a mechanism for remedying the situation where licensees pay for agency services that do not benefit licensees. These services amount to \$56.2 million and include:

- *International cooperative safety programs and international safeguards activities*
- *Agreement state oversight*
- *Site decommissioning management plan activities not recoverable under 10 CFR 170*
- *Fee exemption for nonprofit educational institutions*
- *Licensing and inspection activities associated with other Federal agencies*
- *Cost not recovered from Part 171 for small entities*
- *Regulatory support for agreement states*
- *Decommissioning/reclamation*

(A) What is the actual fee reduction you will propose?

Response. The Commission has determined that reducing the percentage amount the NRC must recover through fees accomplishes the goal of reducing the financial burden on NRC licensees attributable to fairness and equity issues while allowing the NRC to budget for activities which support necessary government functions or national policy requirements. We have notified the Office of Management and Budget that if Congress does not enact such legislation in fiscal year 1999, the Commission intends to develop, as part of our fiscal year 2000 budget request, a legislative proposal to revise the Omnibus Budget Reconciliation Act of 1990 (OBRA-90) to reduce the percentage amount of budget authority that the NRC is required to collect in fees. Based on previous work, the collection requirement could be revised to remove 10 percent of the agency's budget authority from the fee-based category, in addition to amounts appropriated from the Nuclear Waste Fund and for regulatory reviews and other assistance provided to DOE.

Question 34. (B) What changes will be made in the NRC's budget to accommodate the fee reduction? If the basis is a percentage reduction, how does this percentage relate to actual expenses for these activities?

Response. If legislation is enacted to exclude additional costs from fee recovery, the NRC's budget request will continue to include the resources necessary to accomplish our mission, including those activities excluded from fee recovery. Fee collections would approximate the amount appropriated, less the excluded amounts. For example, if NRC's (non-high-level waste, non-DOE) budget is \$450 million and \$45 million is excluded from fee recovery, fee collections would be approximately \$405 million.

It is expected that 10 percent of the total budget would be close to the budgeted amounts for these activities. The NRC's intent is to provide a simple yet accurate process for estimating the amount we expect to expend in these areas. The amount is not the same each year and is dependent upon such factors as the number of licensees, the number of Agreement States, and the number of licensees that meet the agency criteria for a small entity.

Question 34. (C) Does the proposed fee reduction include all of the activities described above as currently comprising the 56.2 million? Will overhead costs associated with these activities also be eliminated?

Response. Yes, all the previously mentioned activities comprise the existing fairness and equity concern categories. As a point of clarification, the categories of budgeted costs that raise fairness and equity concerns include all international activities (except import/export licensing activities), not just those described above, and only generic decommissioning and reclamation activities (specific licensing and inspection activities related to decommissioning and reclamation are charged to the specific licensee receiving the service). We expect that a 10 percent reduction would include funding required for these activities and would provide stability.

Where appropriate, the estimated amounts include a portion of associated overhead and agency general and administrative costs, and therefore would be excluded from fee recovery.

Question 34. (D) Where will the funds come from to pay for these services if they are excluded from user fees?

Response. Amounts off the fee base are not be collected by the NRC to offset the agency's budget. The excluded costs would be included in the net amount appropriated to the agency from the general fund. Legislation could also be enacted to revise the IOAA to allow NRC to charge other Federal agencies for services rendered (i.e., Part 170 fees).

Question 34. (E) How will your proposal ensure that licensees will not pay for these activities in the future?

Response. The NRC's fees are established by regulation to meet, but not exceed, the legislatively required fee recovery amount. It is the agency's intent that any fee-reduction proposal it submits be used to modify the OBRA-90, or similar legislation enacted by Congress, and therefore remain in effect as long as that legislation is in effect.

Question 35. (A) Please explain why action to address NRC's fee inequities has been delayed for more than 5 years.

What is the Commission doing to rectify the NRC's fee inequities?

(B) Please identify each action NRC has taken to address any concerns raised by Office of Management and Budget regarding the NRC fee structure.

Response. Absent legislative relief, the Commission has limited ability to remedy any inequities in its fee structure because it is required to collect approximately 100 percent of its budget in fees. The NRC has taken several actions within existing fee laws to address concerns regarding its fee structure:

- Identified fairness and equity concern categories in the February 1994 Report to Congress on NRC Fee Policy, indicating that legislation was necessary to address these concerns. The recommended legislation was not enacted.
- In fiscal year 1995, acted under existing fee laws to help to mitigate the fairness and equity concerns by treating costs for these activities similar to overhead and distributing the costs to the broadest base of NRC licensees.
- Established a policy to obtain reimbursement for services provided to other Federal agencies when such reimbursements are authorized by law.
- Obtained appropriation legislation which removed from the fee base certain costs incurred as a result of regulatory reviews and other assistance provided to the Department of Energy and other Federal agencies.
- Initiated a study in 1997 which led to changes in NRC's fiscal year 1998 fee rule to shift cost recovery for certain activities from annual fees to specific fees for services. For example, effective with the fiscal year 1998 final fee rule, the NRC is assessing fees to the major licensees to recover the full cost of resident inspectors. In addition, costs incurred within 30 days after the issuance of an inspection report are being billed to the specific licensee.
- As part of the Strategic Realignment and Baseline initiative (DSI 21) in late 1996, updated the information presented in the 1994 Report to Congress on NRC Fee Policy, and posed the policy issued again to the Commission. Based on that update and subsequent information, the Commission notified OMB in June, 1998, that the NRC intends to propose, as part of its fiscal year 2000 budget submission, legislation which would reduce the portion of our budget authority that the NRC is required to collect in fees, if Congress does not enact such legislation in fiscal year 1999. In the past, the OMB has advised that such legislation, which would address fairness and equity concerns, would be inconsistent with the President's budget.
- Continuing ongoing studies that may impact the fiscal year 1999 fee rule.

Question 36. The NRC has stated that a portion of its 3 percent increase in its budget is attributable to an \$8.9 million increase in contractor support. Excluding the \$2.5 million related to high-level waste activities, please provide a detailed description of how the remaining \$6.4 million for contractor support is allocated.

Response. The net increase of \$6.4 million is primarily attributable to the following arenas:

ARENA	COMMENTS	\$M
Nuclear Materials Safety ..	Increased requirements to support United States Enrichment Corp.'s Atomic Vapor Isotope Separation (AVLIS) facility licensing review; Initiate program to register Licensees' devices and continue development of the Licensing and Inspection Online System; Develop, revise and improve procedures in the Agreement States program Fund effort for developing trend analysis of material licensee safety performance; Evaluate nuclear materials event experience on a risk performance basis;	2.2
Nuclear Waste Safety	Expand support for investigation of harassment and intimidation cases Support review of increase in number of spent fuel storage and transportation licenses.	0.8

ARENA	COMMENTS	\$M
Common Defense and Security and International Development.	Additional costs to support the Nuclear Materials Management Safeguards Systems.	0.5
Protecting the Environment	Increased support for decommissioning activities due to additional plants entering decommissioning status; Increased requirements for decommissioning research and regulation development related to transportation process.	1.7
Management and Support	Increased rent for Headquarters and regional offices, and increased building and maintenance operations; Increased Information Technology requirements for user technical support, maintenance and operation of agency information systems; Continued development of agency-wide integrated resource management system	3.5
Reactor Safety	Reduced contractor support for power reactor inspection activities; Reduced support for reactor performance assessment and data analysis activities; Reduced research in thermal hydraulics related to power reactors; Reduced contractor support for analysis of operational experience data based on strengthening agency civil service resources.	- 2.4
Inspector General	Additional support requirements	0.1
TOTAL		6.4

Question 37. Other agencies that use a fee-based system allocate a much higher percentage of their fees to specific services. Yet the NRC fee schedule collects approximately 80 percent of the total fees for generic activities. Approximately only 20 percent of NRC fees are allocated for discrete services. In response to a question by Congressman Schaefer, the NRC has said that reasons for the low percentage of its fees being allocated to specific services include (1) NRC inability to recover costs for providing specific services to most Federal agencies and for infrastructural services rendered to Agreement States; (2) exemption of nonprofit educational institutions from fees; and (3) a reduction in fees for small businesses. These activities only account for \$56.2 million of the 80 percent generic fees collected.

(A) What agency activities are supported by the remaining \$304 million in generic fees?

Response. As required by OBRA-90, the agency first recovers fees for services under the IOAA, and the remainder of the budget authority is to be recovered through annual fees. In addition to the costs for generic activities (such as direct program costs for rulemaking, research, and maintenance of an incident response center), the annual fees also include costs of activities that are not recovered from IOAA fees assessed to applicants and licensees (such as contested hearings, responses to allegations, and investigations). The agency has previously requested public comment on assessing IOAA fees for these activities, but the comments received did not support changing the current policy. The Commission is taking steps to shift the balance away from annual fees to fees for specific services. Several changes to the Commission's fee policy were made in the fiscal year 1998 fee rule that result in additional activities being subject to specific licensing and inspections fees, such as full cost recovery for resident inspectors and costs expended for inspection activities that occur within 30 days after an inspection report is issued. The agency is currently undertaking a comprehensive review of other activities for potential cost recovery as fees for services to be included in the fiscal year 1999 proposed fee rule for public comment.

Question 37. (B) What steps are you taking to significantly increase the percentage of fees allocated to discrete services so that the benefits derived from NRC activities are more visible to the regulated community?

Response. The Commission is taking steps to shift the balance away from annual fees. Several changes to the Commission's fees were made in the fiscal year 1998 fee rule that result in additional activities being subject to specific licensing and inspections fees, such as full cost recovery for resident inspectors and costs expended for inspection activities that occur within 30 days after an inspection report is issued. We are currently undertaking a comprehensive review of other activities for potential cost recovery as fees for services to be included in the fiscal year 1999 proposed fee rule for public comment.

Question 38. \$97 million of the NRC's fiscal year 1999 budget is designated for contractor fees for Management and Support. In response to a question by Congressman Schaefer on the management and support services that must be contracted for, the NRC identified as examples services for elevator maintenance and software upgrades. Excluding elevator maintenance and software upgrades, what accounts for the \$97 million in contractor fees?

Response. The remaining \$95 million for Management and Support primarily represents the agency's investment in information technology, information management, human resources, administrative services, and financial management. The funding for these activities are as follows:

	\$ Million
Rental payments on Headquarters and regional offices/ facilities operations and support	25.5
Telecommunications support, including local and long distance telephone services, Internet service providers, and other operator services	8.2
Support and maintenance of financial systems, including financial audit services, maintenance of financial systems for fee collection, payroll and other services	7.9
Workstation upgrades, computer operations, and timesharing	7.0
Permanent Change of station	5.9
Local and Wide Area Network maintenance	5.5
Records management (Preservation, disposition, storage, collections, access) and library operations	4.8
Development and implementation of Agency-wide Document Management System	4.6
Duplicating, printing and graphics	3.3
Guard services and security support	3.3
Contract support services that provide specialized adjudicatory support, transcript services, and other administrative services	3.0
Training and Development	2.5
System development and integration	1.8
General supplies, equipment and transportation	1.8
Computer systems operations and support activities	1.7
Year 2000 corrections	1.1
Policy, planning and acquisition support activities	1.0
Personnel and Administrative IT operations and maintenance	1.0
HR IT systems operations and maintenance	1.0
Workman Compensation	0.7
Other Human Resources activities (recruitment and personnel record management)	0.7
Inspector General investigations, audits, evaluation and assessment, and information technology activities	0.7
Health and Employee services	0.6
TOTAL	95.0

Question 39. Much of the work performed by NRC Office of Research appears to be duplicative of research performed by industry and government national laboratories.

(A) How does the NRC determine the value of the research performed by the Office of Research?

Response. NRC does not duplicate industry research. The answer to part (c) of this question discusses this. The NRC determines the value of research performed by the Office of Research in terms of its contributions to the quality and timeliness of regulatory decisions made by the NRC. Eighty percent of our research directly supports regulatory decisions made by NRC's licensing offices. The other 20 percent is anticipatory. It is focused on the potential safety implications of new technology and emerging safety issues to improve NRC effectiveness and to position NRC to respond to agency initiatives.

A key contribution of the Office of Research lies in the identification of risk significant vulnerabilities early and the development of the technical basis for resolution of such issues before they become a threat to public health and safety. The identification of the significance of pressurized thermal shock events for nuclear reactors and the development of the technical basis for regulatory requirements to mitigate undesirable consequences illustrates the value of the NRC's research. Its value is also measured in terms of the long term strategic perspective that it brings to the identification and resolution of safety issues independent from the operational focus of the licensing offices. For example, without the ground breaking work done

by the Office of Research in the field of probabilistic risk assessment, the technical basis would not exist for moving to a risk-informed regulatory approach. Another important contribution lies in the elimination of the need for excessive conservatism in licensing decisions which results from gaps in regulatory knowledge. For example, the Piping Integrity Research Program provided the technical basis and promulgated an amendment to 10 CFR Part 50 Appendix A, General Design Criteria eliminating the requirement to consider dynamic effects of double ended pipe failure for qualifying piping systems. This led to the elimination of massive pipe whip restraints in nuclear power plants. Similarly, the research program provided the technical basis for the Emergency Core Cooling System (ECCS) rule which allows licensees to increase power rate and reduce regulatory burden. Research also provides the basis for risk-informed and performance based requirements which can allow licensees more flexibility in achieving compliance with NRC regulations and encourage use of cost-effective alternatives. For example, licensees may now utilize risk-informed methodologies that extend testing and inspection intervals as a result of NRC research. The Office of Research also adds value by keeping pace with new technology such that the regulatory process does not impede the incorporation of such new technology in nuclear plants. In this regard, the Office of Research's High Burn-Up Fuel Program is directed at developing a technical basis for reviewing industry's proposal to use advanced fuel designs in a timely fashion and increase burn-up limits resulting in economic benefits.

As a result of an increasingly competitive environment, the nuclear power industry is now focusing on increased performance by utilizing new technology and taking advantage of margins inherent in current designs and operating conditions. In effect, the design basis envelopes of the U.S. nuclear power plants will change as requests to modify operating licenses (e.g., technical specifications, power upgrades) and improve operational performance (e.g., longer operating cycles, new fuel designs) continue to be sought. However, these initiatives to improve performance involve complex designs operating in a demanding environment of high radiation, temperature and stress, combined with uncertainties in physical phenomena which occur during transients and accidents. The NRC believes there is a great value in having a vigorous independent research program that will allow the agency to make sound regulatory decisions relative to these initiatives.

Listed below are additional examples of where NRC's research program has added value by enhancing safety by reducing risk at a justified cost, reducing burden on 34 licensees, and by providing a technical basis for credible and timely regulatory decisions. Estimates on the order of magnitude of the outcomes, in risk reduction or cost savings, are several hundreds of millions of dollars for the nuclear industry.

- The PRA research program led to the development of regulatory guides that lay out the process, principles and guidance for licensees to make risk-informed changes to their licensing basis-in-service testing (RG 1.175), graded Quality Assurance (RG 1.176), and technical specifications (RG 1.177). A regulatory guide on risk-informed inservice inspection is nearing completion.
- The Pressure Vessel Safety research program provided the technical basis for a regulation (10 CFR 50.66) and regulatory guide (1.162) accepting thermal annealing of the reactor pressure vessel as a viable method to mitigate the effects of neutron irradiation.
- The Piping Integrity research program provided the technical basis for staff's acceptance of weld overlay repairs off BWR piping as a permanent repair, avoiding costs to replace recirculation piping; resolved concerns over reductions in fracture toughness of cast stainless steel; and provided realistic predictive models for use in evaluating these materials in lieu of very conservative methods put forward by a reactor vendor.
- The Mechanical Engineering research program provided experimental results that identified the potential for certain safety-related motor-operated valves to fail under design basis loadings. This led the staff to issue Generic Letter 89-10 and to require licensee programs to evaluate their motor operated valves to assure their operability under the design basis conditions.
- The Severe Accident research program provided the resolution of the hydrogen combustion issue for all large dry containments resulting in averting the installation of hydrogen igniters on these containments; developed the technical basis for backfitting the requirement for hardened vents in BWR Mark I containments; resolved concern for direct containment heating for large dry containments; and updated the source term (NUREG-1465) which will allow operational improvements and cost savings.
- The Decommissioning research program developed the technical bases for a regulatory guide, and accompanying NUREGs, to support a rule that established radiological criteria for license termination, and based on results of NRC's research

program, assisted licensees in conducting radiological surveys and dose assessments. It is expected that these tools will enable many of NRC's licensees to move through the decommissioning process at substantial cost savings from the past with case-by-case decommissioning.

Question 39. Much of the work performed by NRC Office of Research appears to be duplicative of research performed by industry and government national laboratories.

(B) What efficiency improvements has the NRC considered applying to the Office of Research?

Response. NRC is pursuing a number of measures to become more efficient in conducting research. Among them are:

- Seeking every opportunity to obtain needed resource information through cooperative research programs with industry, the Department of Energy and with foreign countries. Through these cooperative programs NRC has, in the past, and will continue in the future, to highly leverage its funds, and thereby obtain valuable research results at a fraction of what the cost would be if NRC pursued the work unilaterally. Reducing the number of contracts being administered by the Research staff through consolidation of smaller contracts into larger ones targeted at centers of excellence.
- Performing more analytical work using the NRC research staff, in lieu of contracting for these services, when it is cost effective to do so.
- Reducing the Generic Safety issue resolution staff in research by utilizing staff resources in the Office of Analysis and Evaluation of Operational Data to help prioritize and analyze issues.
- Applying PC based computer technology to both our technical and administrative work to achieve both staff and dollar savings.
- Consolidating several computer codes for the analysis of thermal hydraulic transients into a single, easy to use code which will, in the future, reduce maintenance costs by \$1.7M per year and will consume less staff time to run the codes.
- Using internet-based collaborative computing technology and video-conferencing to reduce travel costs.

It should be noted that the NRC research program has been reduced substantially over the years to recognize (a) changes in the industry, (b) the fact that there are no new reactor license applications, (c) the minimal demand for advanced reactors, 35 and (d) that licensees and vendors perform their own analyses as part of their submittals. Seventeen years ago, the research budget was over \$200M and 5 years ago it was over \$100M. Today that same budget is under \$50M, reflecting a purchasing power of less than one-tenth of what it was 17 years ago.

Question 39. Much of the work performed by NRC Office of Research appears to be duplicative of research performed by industry and government national laboratories.

(C) What consideration has the NRC given to assigning the NRC Office of Research to conduct peer reviews of research performed by the industry so as not to duplicate industry research?

Response. NRC does not duplicate industry research. In each of our areas of research we maintain an awareness of related research being planned and conducted by the industry, both domestically and internationally through personal contacts at the staff level and through more formal joint workshops. NRC's research is either of an independent confirmatory nature or is anticipatory research looking at potential or emerging issues to better understand their safety implications. Sometimes, because the NRC and industry are conducting research in similar areas, it may appear to be duplicative when it is not. A good example of this situation is the work NRC and industry are doing with respect to steam generator tube degradation and rupture.

Relative to steam generators, as appropriate for a regulator, the NRC's research program is addressing (1) independent verification of the capabilities of non-destructive examination techniques currently in use, (2) and the development and validation of models used to predict the failure of degraded steam generator tubes, and (3) the likelihood of that failure resulting in a stable leak versus a full rupture of the tube. To fulfill their primary responsibility for safety, industry efforts are more directed to developing new inspection techniques and to developing methods for mitigating the degradation. However, there are common interests in many of these areas. Consequently, the NRC, the Electric Power Research Institute, and some foreign organizations are forming a collaborative research effort to share information, and cofund activities to avoid duplication and minimize costs.

NRC has a Memorandum of Understanding with EPRI and our staffs meet periodically to coordinate our respective research efforts. We also meet periodically with the Department of Energy for the same purpose. These meetings help assure that we cooperate when possible and avoid duplication of effort. In addition we have approximately 35 active Cooperative Bilateral Research Agreements, as well as another 45 Cooperative Research Agreements that are being extended or considered with organizations in more than 25 countries.

Question 40. The Office of Research's responsibility for rulemaking activities has been transferred to the Office of Nuclear Reactor Regulation.

(A) Prior to this transfer, what percentage of the Office of Research budget was allocated to rulemaking activities?

Response. Prior to the rulemaking transfer, the fiscal year 1998 budget for the Office of Nuclear Regulatory Research had 13.1 percent of its FTE and 4.2 percent of its contract support/travel funds allocated to the rulemaking function.

Question 40. The Office of Research's responsibility for rulemaking activities has been transferred to the Office of Nuclear Reactor Regulation

(B) What changes have been made in the Office of Research budget to reflect the reduction in responsibility?

Response. Twenty-six FTE and contracts with a value of approximately \$2.0M were transferred from the fiscal year 1998 research budget to the budgets of the Office of Nuclear Materials Safety and Safeguards, the Office of Nuclear Reactor Regulation and the Office of Administration. These transfers moved all of the resources for research rulemaking activities into these three offices.

Question 41. The Office of Research expends funds to evaluate phenomenological sequences associated with severe accidents for which there is virtually no empirical data. This lack of data results in high uncertainty in the results, potentially leading to more and more research.

Given the low likelihood that a definitive determination about phenomenological sequences can be made, what is the benefit of continuing to expend resources in this area of research?

Response. Severe accident research has been conducted to obtain data on phenomena associated with low probability events and for which little if any data exists from operating experience. Although an extensive severe accident research program was conducted in the past, most of the research programs have now been completed. Most of these efforts were ended when it was determined that there was a sufficient understanding of the severe accident phenomena to support needed regulatory decisions. As part of this determination, programs have not been continued when it was determined that there was a low likelihood that further research would provide additional benefit in resolving severe accident issues or when bounding assumptions could be used to account for the continued uncertainty in understanding the phenomena. As progress has been made in understanding severe accident phenomena, the NRC severe accident research program has brought a number of issues to closure and therefore, has been substantially reduced over the past several years. Program results have been used to develop analytical tools to predict the course and consequences from such low probability accidents. The current program focuses primarily on maintaining and consolidating the existing analytical tools which preserve the knowledge and understanding resulting from previous severe accident research. At this time only a small portion of our current severe accident research budget is for experimental work and this is directed at improving our analytical tools where such improvements will support the resolution of remaining severe accident safety issues.

Question 42. (A) In response to a question by Congressman Schaefer, the NRC indicated that it will commit 25 FTEs to review each license renewal application. Yet, a response to another question indicated that a portion of the NRC's budgeted \$8.9 million in contractor fees will go to contractor support to review reactor license renewal applications. Given the relatively narrow scope of the license renewal application, 25 FTEs would seem to be sufficient to review each license renewal application on a relatively abbreviated schedule.

Please provide the job task analysis upon which the decision to allocate 25 FTEs to each license renewal application was based?

Response. A formal job task analysis is not the appropriate tool to estimate the resources necessary to support the review process for a license renewal application. The NRC's process for controlling the review of a license renewal application is contained in NRR Office Letter No. 805, "License Renewal Application Review Process." This office letter describes the process steps for the review of an application, the

responsibilities of staff organizations involved in the review, and provides a method for identifying and implementing lessons learned from the review of the first applications. Based on the experience gained from the review of the first applications, the Commission expects that the review process for subsequent renewal applications will be more efficient. Our current estimate is that it will take approximately 22 direct FTE to review each license renewal application.

The NRC has established plant-specific schedules to ensure that reviews of license renewal applications are completed within 30–36 months of receipt of the application, including any hearings. The milestones in the schedules are as follows:

Milestone	Week
Receive renewal application	0
Notice application tendered	2
Complete acceptance and docketing	4
Public meeting and environmental impact statement (EIS) scoping	12
Staff complete technical requests for information (RAIs)	20
Staff complete environmental RAIs	24
Applicant complete technical RAI responses	30
Applicant complete response to environmental RAIs	32
Issue draft environmental statement (DES) for comment	44
Staff complete safety evaluation report (SER) and identify open items	46
Public meeting to discuss DES	48
Complete DES comments	54
Applicant complete response to open items	62
Staff issue supplemental SER & final environmental statement (FES)	78
ACRS Recommendation to Commission on Application	90
Commission decision on application	120
Issue new license	120–146

The milestone schedules and the detailed process described in Office Letter No. 805 were used to determine the resources needed to complete the review of a renewal application. The model developed describes the tasks and corresponding milestones and evaluates the functions and expertise necessary to complete the review. Resources are currently being allocated to meet the milestone schedules.

Question 42. (B) What contractor services are anticipated to be needed for license renewal reviews that cannot be performed by the 25 FTEs?

Response. Contractor services are used to provide specialized technical expertise not available on the staff. For the review of license renewal applications, contractor services are used primarily for the resolution of generic issues and for performing environmental assessments. Only a small portion of the \$8.9 million increase in NRC's contract assistance funding is allocated to the review of license renewal applications (approximately \$110K per application per year).

Question 42. (C) Given that there are to be 25 FTEs and contractor support assigned to each license renewal application, why will it take the staff 18 months to issue the Safety Evaluation Report?

Response. Upon receipt of a license renewal application, the NRC (1) reviews the technical information contained in the application for compliance with the applicable regulations, (2) assesses potential environmental impacts in accordance with the requirements of the National Environmental Policy Act, (3) performs verification inspections of selected site-specific programs and activities credited for license renewal, and (4) participates in adjudicatory hearing activities, if a hearing is requested. Experience has shown that initially submitted applications do not always contain all the information necessary for the NRC to make the findings required for issuance of a license, requiring additional time for the NRC to request additional information from the applicant, the applicant to prepare and submit the information, and the staff to review the submitted information. The schedule also reflects the necessary public participation in the environmental review which occurs during the same period. The NRC's schedule integrates these activities, conducting them in parallel to the maximum extent possible to ensure an expeditious review.

Question 43. (A). Despite many revisions to the NRC's enforcement program since its inception in 1980, the industry and the Union of Concerned Scientists continue to criticize the NRC for its failure to correct the many problems that have been identified. These problems include failing to properly focus NRC and licensee resources on

issues most important to safe plant operation; aggregating violations to support a higher violation level or civil penalty; extrapolating programmatic deficiencies from a given event or violation; and basing enforcement decisions on subjective, undefined terms such as "regulatory concern" and "regulatory significance." We understand that both the industry and the Union of Concerned Scientists recently have suggested that the NRC make significant revisions to eliminate these deficiencies.

What steps will the NRC take to ensure that each enforcement action is directly related to safety significance of the noncompliance?

Response. Noncompliances vary in their degree of safety, safeguards, or environmental significance; for that reason, the enforcement policy provides a graduated system of sanctions, varied according to the technical significance (i.e., actual and potential consequences) and the regulatory significance. This graduated system appears both in the range of severity levels assigned to different violations, and in the availability of different enforcement actions (e.g., Non-Cited Violations (NCVs), Notices of Violation (NOVs), civil penalties, and orders). Maintaining a safety focus was addressed in the 1995 enforcement program reassessment (NUREG-1525) and the recent 1998 enforcement program review (NUREG-1622).

Modifications have been made to the enforcement policy to assist the staff and industry in maintaining a safety focus. For example, Section IV of the enforcement policy provides that minor violations not be the subject of formal enforcement action and not normally be documented in inspection reports. When sufficient information regarding a licensee's corrective actions exists on the docket, the NRC may waive a licensee's response to an NOV. Civil penalties are no longer proposed for repetitive Severity Level IV violations, unless the repetitive violation is such that it warrants classifying the matter as a Severity Level III violation. The enforcement policy continues to provide that Licensee-identified and corrected Severity Level IV violations be dispositioned as NCVs, provided they meet the remaining criteria for discretion in the policy.

In a Staff Requirements Memorandum (SRM) dated August 25, 1997, the Commission outlined a general approach to safety and compliance. The discussion stated:

As commonly understood, safety means freedom from exposure to danger, or protection from harm. In a practical sense, an activity is deemed to be safe if the perceived risks are judged to be acceptable. The Atomic Energy Act of 1954, as amended, establishes "adequate protection" as the standard of safety on which NRC regulation is based. In the context of NRC regulation, safety means avoiding undue risk or, stated another way, providing reasonable assurance of adequate protection for the public in connection with the use of source, byproduct and special nuclear materials.

While there is agreement on the need to maintain a safety focus, disagreements may occur as to the safety significance of any particular violation. In the view of the NRC, a violation need not always result in an actual impact to the public or to an employee (e.g., a release of radioactive material to the public or an employee overexposure to radiation) before it is considered significant. In resolving differing views on safety significance, considerations should include all aspects of safety significance as applied to enforcement, including the actual safety consequence, the potential safety consequence, and the regulatory significance. Violations may be indicative of performance that could have consequence or potential consequences if not corrected, and therefore have regulatory significance. These include willful violations, false statements, programmatic issues, repetitive violations, and cases where it is fortuitous that a more significant violation did not occur with actual consequences.

As noted in the Commission-approved discussion on safety and compliance in a August 1997 SRM on the subject:

Safety is the fundamental regulatory objective, and compliance with NRC requirements plays a fundamental role in giving the NRC confidence that safety is being maintained. NRC requirements, including technical specifications, other license conditions, orders, and regulations, have been designed to ensure adequate protection—which corresponds to "no undue risk to public health and safety"—through acceptable design, construction, operation, maintenance, modification, and quality assurance measures. In the context of risk-informed regulation, compliance plays a very important role in ensuring that key assumptions used in underlying risk and engineering analyses remain valid.

Given the misperception that safety significance is always synonymous with actual consequence, additional enforcement guidance was provided directing that correspondence transmitting escalated enforcement actions indicate whether the issue was safety significant because of the actual or potential consequence or because of the regulatory significance (e.g., repetitive, willful, programmatic, etc.), or because

of a combination of these issues. In addition, the NRC is currently working on clarifying the term regulatory significance and evaluating whether it should be included as a component of safety significance.

Question 43. (B) What actions will the NRC take to ensure that enforcement action is based on specific, objective and, as feasible, risk-informed criteria?

Response. Future efforts to improve the enforcement program include: (1) further meetings with stakeholders to obtain additional perspectives on enforcement and to consider the need for changes to the enforcement program, with the short-term focus on non-escalated enforcement, as described in response to Question 17 and longer term focus on escalated enforcement, including consideration of a forth coming NEI proposal, (2) developing additional guidance on thresholds for low-level and minor violations, (3) developing additional guidance to consider risk in enforcement decisions and the use of regulatory significance for significant enforcement actions, (4) conducting additional training describing the guidance for these changes and initiatives for staff involved in inspection and enforcement activities, (5) auditing the consistency of issuance of low-level violations, and (6) developing closer coordination between inspection and enforcement activities.

Question 43. (C) What actions will the NRC take to eliminate enforcement actions based on subjective judgments?

Response. As stated before, the NRC will continue to develop additional guidance to consider risk in enforcement decisions and the use of regulatory significance for significant enforcement actions. Additional training describing the guidance for these changes will be conducted for the staff. While there is a commitment to minimize subjectivity and increase objectivity and predictability, the enforcement process by its nature and the breadth of NRC licensed activities requires the exercise of judgment and discretion. Thus, all subjectivity cannot realistically be eliminated.

Question 43. (D) What action will the NRC take to incorporate into its enforcement program progressive enforcement approaches used by other Federal agencies with public health and safety responsibilities?

Response. The NRC reviewed other enforcement programs and policies as part of its 1995 program assessment. Most recently, the NRC met with Federal Aviation Administration (FAA) senior representatives on July 27, 1998, to discuss its enforcement programs and approaches suggested by industry. Like the NRC's enforcement program, many of the FAA programs also consider issues of identification, corrective action, and whether violations were committed willfully. While there are similarities in the approaches, differences in the regulated programs may not make some of the approaches appropriate for the NRC. Although industry suggested that the NRC consider enforcement approaches employed by the Occupational Safety and Health Administration (OSHA), the NRC has not looked into the OSHA program because of the significant differences in the NRC and OSHA regulatory approach. Specifically, OSHA does not have licensees and OSHA does not generally perform routine, periodic inspections of entities that are subject to their regulations. We have also discussed enforcement approaches with the Environmental Protection Agency (EPA) and the Department of Transportation. NRC will continue to evaluate other enforcement approaches as part of broader potential changes being considered.

Question 44. In light of the significant strides the industry has made in achieving sustained safe plant performance over the past several decades, we are concerned about the NRC's enforcement statistics for 1997. For example, both NRC and industry indicators confirm a continuing trend of safe performance and improving reliability. Yet the NRC issued 50 percent more violations to the industry between 1996 and 1997; and the NRC issued 92 percent more violations since 1990. Of significant concern is that most of these violations (1427 of 150—?) were for noncompliances determined by the NRC to be of low safety significance. Since 1995, the NRC has also issued 66 percent more non-cited violations and deviations, i.e., enforcement action for matters that, by definition, are predominantly administrative. The NRC's enforcement approach seems to require licensees to apply considerable resources to processing low safety significant enforcement actions, thereby diverting NRC and licensee attention from potentially more safety significant issues.

(A) What actions will the NRC take to ensure that its enforcement process recognizes sustained good performance by the industry?

Response. The NRC's enforcement program currently recognizes good performance by the industry in both its escalated and non-escalated programs. If a licensee displays good performance by identifying and correcting non-repetitive low-level violations, the NRC dispositions the issues as Non-Cited Violations (NCVs): an administrative tool to document and track the issue that does not require a licensee re-

sponse. In the escalated program, if a licensee has not had escalated enforcement action within a 2-year or 2-inspection period (whichever is longer), the decision or whether or not a civil penalty will be proposed is based solely on whether the licensee's corrective actions were prompt and comprehensive. In addition, notwithstanding the normal enforcement process, the enforcement policy provides the necessary flexibility to recognize good overall sustained performance by reducing or refraining from issuance of a civil penalty to a Notice of Violation through the exercise of enforcement discretion (i.e., Section VII.B.3, "Violations Involving Old Design Issues," and Section VII.B.6, "Violations Involving Special Circumstances").

Enforcement is an integral part of the NRC and NRC stakeholder effort to develop a licensee performance assessment process that makes increased use of objective performance indicators. As this process is developed and implemented, the enforcement program will be modified to incorporate the new methodologies and ensure that both NRC and licensee resources are directed to the more safety significant issues.

Question 44. (B) What action will the NRC take to ensure that its enforcement action does not force the licensee and the NRC to focus resources on nonsafety significant matters.

Response. As stated before, efforts are underway to reinforce existing guidance and policy to (1) give credit for licensee actions in both identifying and correcting violations in deciding whether to cite a low-level violation, (2) not require a written response when low-level violations are issued and corrective actions are sufficiently addressed in writing elsewhere on the docket, e.g., in a Licensee Event Report, (3) provide more consistent treatment for multiple violations with common root causes, and (4) clarify guidance for violations identified as a result of licensees' corrective actions. As a result of ongoing efforts, such as the review of the NRC enforcement program issued in April 1998 (NUREG-1622, "NRC Enforcement Policy Review"), the NRC recognizes that improvements can and must be made in its efforts to focus on safety and on consistency in its treatment of violations, especially the thresholds for low-level violations. Special enforcement review panels were established to review all potential Maintenance Rule and 10 CFR 50.59 escalated and non-escalated enforcement actions for consistency of approach and determination of safety significance. In addition, future efforts include: (1) further meetings with stakeholders to obtain additional perspectives—on enforcement and to consider the need for changes to the enforcement program, (2) developing additional guidance on thresholds for low-level and minor violations, and (3) developing additional guidance to consider risk in enforcement decisions and the use of regulatory significance for significant enforcement actions.

Question 44. (C) Please provide a schedule for completion of all actions cited above to revise the NRC's enforcement program.

Response. The NRC issued an Enforcement Guidance Memorandum (EGM 98-006) on July 27, 1998, that reinforced existing guidance and policy on not citing licensee-identified and corrected nonrepetitive violations, waiving licensee's responses when corrective action information is already on the docket, and treatment of multiple violations and violations identified as a result of a licensee's corrective actions (items (1)-(4) in the previous question). The NRC held a public meeting with stakeholders on September 3, 1998, to solicit input on possible enforcement policy revisions. A revision of nonescalated enforcement policy is expected to be presented to the Commission in October for their approval. The NRC staff is expected to develop additional guidance on regulatory significance by late Fall of this year and thresholds for low-level and minor violations at the end of this year. The NRC staff plans on developing risk-informed examples for inclusion in the supplements of the enforcement policy in the Spring of 1999. The NRC staff also expects a proposal from NEI for changes in escalated enforcement policy and will review that proposal and report to the Commission in the Spring of 1999.

Question 45. (A) The NRC has stated that it takes enforcement action to "send a message" regarding the "regulatory significance" of a violation as well as the agency's underlying "regulatory concerns." Neither "regulatory significance" nor "regulatory concern" is a defined term, and therefore both are extremely subjective. Particularly given the nature of enforcement action, using these terms as the basis for enforcement action would seem inappropriate.

How does the NRC distinguish between regulatory significance and regulatory concern as a basis for taking enforcement action?

Response. Noncompliances have varying degrees of safety, safeguards, or environmental significance. The enforcement policy provides a graduated system of sanctions, varied according to the technical significance (i.e., actual and potential con-

sequences) and the regulatory significance. Regulatory significance, while not “defined,” has traditionally been understood to involve issues that have the potential for impact on safety, such as programmatic failures, repetitive violations, willful violations, reporting failures, licensees’ refusal to comply, and management involvement. The NRC reviews each case on its own merits to ensure the severity of the violation is characterized at the level best suited to the significance of the particular violation.

When an issue is evaluated and categorized at the Severity Level III level, by definition it is, “cause for significant regulatory concern.”¹ As a regulator mandated to ensure that the civilian uses of nuclear materials in the United States are carried out with adequate protection of public health and safety, we are concerned when a system designed to perform a certain safety function would fail to operate under certain circumstances if called upon to work. Defense in depth and acceptable margins of safety are at the foundation of the NRC regulatory process. We are also concerned when a worker falsifies a surveillance test because our regulatory program is based on licensees and their contractors and employees acting with integrity and communicating accurately. At an individual level, instances of willful misconduct reduce the NRC’s confidence that if these individuals were subsequently involved in licensed activities, the activities would be conducted in a manner that adequately protects the public health and safety. At a higher level, instances of willful misconduct may also raise questions about the potential pervasiveness of the problem and the licensee’s ability to establish a safety-conscious work environment.

The regulation of nuclear activities does not always lend itself to a mechanistic treatment. Judgment and discretion must be exercised in determining the severity levels of violations and the appropriate sanction. As such, to ensure consistency, technical accuracy, and balanced views, issues that may be categorized at Severity Level 111 are addressed in enforcement review panels with routine participation from regional offices, the Office of Enforcement, and the Office of Nuclear Reactor Regulation. Special scrutiny is given to those cases that include issues that have regulatory significance (e.g., programmatic failures, willful violations, repetitive violations, etc.).

Question 45. (B) What actions will the NRC to eliminate undefined terms such as “regulatory concern” or “regulatory significance” from its enforcement process?

Response. The Commission recently requested that the staff develop a definition and explanation of “regulatory concern” and “regulatory significance” for possible inclusion in the enforcement policy. The staff will also review the advantages and disadvantages of the current inclusion of regulatory significance” as a component of safety significance. The NRC staff is expected to report back to the Commission in the late Fall.

Question 45. (C) What is the NRC’s criteria for “sending a message” through the enforcement process?

Response. The NRC does not have any defined criteria for “sending a message” through the enforcement process. Instead, the enforcement policy is structured to provide a graduated approach to noncompliances and provides examples of noncompliances at various levels of significance to aid the staff in developing the appropriate enforcement sanction for a given set of facts and circumstances. However, the regulation of nuclear activities in many cases does not lend itself to a mechanistic treatment. Accordingly, the NRC’s enforcement process provides that judgment and discretion be exercised in determining the severity levels of violations and the appropriate sanction as provided in Section VII, to “ensure that the resulting enforcement action appropriately reflects the level of NRC concern regarding the violation at issue and conveys the appropriate message to the licensee.”

Enforcement actions are legal sanctions based on noncompliances with legal requirements. The byproduct of a cohesive enforcement action is an effective communication tool. Enforcement action transmittal letters communicate with a range of audiences, some more familiar than others with the inspection findings. While the primary audience is the involved licensee, secondary audiences may include site management, corporate officials not directly involved in nuclear activities, other licensees with similar activities, NRC staff, the media, and interested members of the public. Enforcement actions can serve a valuable purpose in making sure that licensees understand the importance of compliance. Incentives are provided to identify and correct violations. There is also a deterrent purpose. As such, enforcement actions should be constructed to convey the regulatory message derived from applying the enforcement policy to the circumstances of the particular case. The NRC has

¹ Section IV of the Enforcement Policy, NUREG-1600, Rev. 1.

encouraged, for instance, including a description of the licensee's corrective action, to give credit where good action has been taken. By emphasizing those aspects of licensee performance that the NRC considers important, other licensees gain ideas on how to improve their performance in similar areas. In addition, the letters may address the need to avoid violations, the need to be responsive to opportunities to identify violations, the need to reverse past poor performance and sustain good performance, the significance of multiple violations, the impact of violations of extended duration, and the need to maintain high standards of integrity.

Question 46. The NRC states that its Enforcement Policy encourages licensee to self identify and correct noncompliances. Yet the NRC may impose a 100 percent penalty if either the licensee does not identify or satisfactorily correct a noncompliance. The Enforcement policy also provides for the imposition of a 200 percent penalty if the licensee neither identifies nor corrects the noncompliance. This approach appears to be very punitive.

How does withholding extraordinary punishment ensure licensee self identification and correction of noncompliances.

Response. The current civil penalty assessment process is not limited to the consideration of two factors, identification and corrective action. Instead, the assessment process considers four decisional points, involving past performance, identification, corrective action, and those issues that may warrant exercising enforcement discretion.

The first decisional point addresses whether the violation is the first escalated enforcement action that the licensee has had during the past 2 years or past two inspections. If the licensee has not had any past escalated actions, the assessment process then addresses the promptness and comprehensiveness of the licensee's corrective actions and then whether there are special circumstances that may warrant discretion. In this scenario, the issue of identification is not considered. In other words, even if the NRC identified the violation, this strategy is designed to provide flexibility for licensees who have traditionally been good performers. This strategy also places a premium on corrective action.

On the other hand, if a licensee has had past escalated actions, the process addresses whether the licensee should be given credit for actions related to identification and corrective actions and then whether there are special circumstances that may warrant discretion. In this scenario, the staff believes a base civil penalty² is appropriate if the licensee only warrants credit for either self-identification or corrective action because the process reflects that the licensee has had a history of escalated action. However, even if a licensee has had a history of past actions, under the assessment process, a licensee would not normally be subject to a civil penalty if it identified and corrected the current violation. As stated before, this strategy gives more weight to the licensee's current performance and provides incentives to identify and correct violations.

In addition to the civil penalty assessment process, the Enforcement Policy provides incentives to identify and correct violations by exercising discretion and reducing or refraining from issuing sanctions for (1) violations identified during extended outages, (2) violations involving old design issues, (3) violations identified as a result of corrective actions being taken in response to previous violations, (4) violations involving certain discrimination issues where the licensee, without government intervention, provides a remedy to the person discriminated against and takes comprehensive corrective action.

The purpose of the NRC enforcement program is not to penalize licensees or maximize penalties, but to emphasize the need for licensees to prevent violations and, when they occur, to identify and correct them before events occur with potential impact on the public. Compared to the numbers of licensee personnel, NRC has very few inspectors available to confirm compliance with regulations. Licensee employees are in the best position to identify noncompliances based not only on their numbers, but also by their thorough knowledge of the facilities. This capability can be rewarded by avoidance of Notices of Violation or complete mitigation of civil penalties when licensee self-identification reveals violations and the violations are corrected and reasonable actions are taken to prevent recurrence.

Question 47. The NRC states that it rewards licensees through the enforcement process "by avoidance of Notices of Violation or complete mitigation of civil penalties

²It should be noted that most enforcement actions for reactor licensees include Severity Level III violations or problems and that the base civil penalty at this level is \$55,000; half the amount allowed by statute. The assessment process is not designed to maximize penalties. Under the Atomic Energy Act, the NRC has authority to issue penalties of \$110,000 per violation per day.

when licensee self identification reveals violations, the violations are corrected and reasonable actions are taken to prevent recurrence." Yet, in response to a question by Congressman Schaefer, the NRC indicates that 40 percent of the level four violations issued in 1997 were self-identified.

If these violations also were satisfactorily corrected, why was enforcement action nevertheless taken?

Response. As a point of clarification, during 1997, approximately 40 percent of Severity Level IV violations were not formally cited through mitigation discretion. A NonCited Violation documents a noncompliance in an inspection report for tracking purposes, but does not result in a formal enforcement action or require a licensee response. It is recognition that while no violation is acceptable, the licensee took positive action by identifying and correcting the violation. Avoidance of formal enforcement action with the burden of a response may provide incentives to identify and correct violations without NRC involvement.

Question 48. The NRC takes enforcement action for low safety significant violations because "in different circumstances the occurrence of the same or a similar violation may be more significant because of the coincidence of other factors." This seems to provide the NRC staff with an unlimited opportunity to conjure up scenarios that may be extremely far afield from the original violation. Please list all violations where this has been the basis for the imposition of enforcement action in 1997-1998.

Response. The NRC does not maintain a list where this particular factor has been the basis for enforcement actions. Development of such a historical list would require manual review of inspection reports and would involve significant resource expenditures. The underlying basis of nonenforcement actions is the failure to comply with legally binding regulatory requirements. The manner in which a violation is dispositioned (i.e., escalated or non-escalated action, or Non-Cited Violation) is based on an assessment of its safety significance. Safety significance, as used in the enforcement program includes consideration of the actual consequence, the potential consequence, as well as other factors that may represent regulatory significance, e.g., repetition, willfulness, pervasiveness. Severity Level IV violations by definition are less serious than Severity Level III violations ("cause for significant regulatory concern"), but are of more than minor concern; i.e., if left uncorrected, they could lead to a more serious concern. Evaluating and categorizing the severity of violations requires judgment. The key to a fair assessment is that the facts be weighed and reasonable scenarios be considered. For example, the failure to post a high radiation area that has changing dose rates (such as a fuel transfer canal) may not result in an actual consequence on a given occasion because of the position of the fuel. However, it is reasonable to conclude that the same failure to post the high radiation area could just as easily result in an overexposure on another occasion due to the new position of the fuel. The failure to perform a post-maintenance test on a pump does not result in an actual consequence when the pump was properly serviced and restored. However, it is reasonable to conclude that the same failure on another pump could result in an actual consequence, such as the pump failing to operate when called upon to perform its safety function, had the pump been inoperable when returned to service.

Question 49. (A) We understand the NRC is engaged in an effort to review its assessment process, including the Senior Management Meeting (Watch List process) and the Systematic Assessment of Licensee Performance. We also understand that the vote sheets on the staff's request to issue the revised assessment process for public comment suggest that the Commission had significant concerns about the revised process.

When do you expect the evaluation of the assessment process to be completed?

Response. By January 1, 1999, the NRC staff will have completed the evaluation of the assessment process and will have made recommendations to the Commission for improvements to the process. Resolution of public, industry, NRC staff and Commission comments play an integral part in the recommendations for improvement. The public comment period for improvements to the performance assessment process will end in October 1998.

Question 49. (B) Given that the industry has suggested an alternative assessment approach, is the NRC working with the industry to address their concerns?

Response. Yes, the NRC is working with the industry to develop improvements to the assessment process. Several meetings have been held with representatives of the Nuclear Energy Institute to review the NEI proposal for an alternative assessment approach. Further, the NRC held a public workshop in September 1998, during

which the NRC staff worked with members of the industry and public to develop improvements to the assessment and regulatory oversight processes.

Question 50. A primary concern expressed about the NRC's current assessment process is the lack of definition of what constitutes acceptable performance. Adding to this concern are the assessment's subjectivity, lack of objective indicators, lack of safety focus, and overemphasis on enforcement actions.

(A) How does the NRC's assessment process address each of these concerns?

Response. The NRC is currently working with industry, the public, and other stakeholders to develop a revised assessment process. A 4-day public workshop is scheduled for September 1998 to expedite development of the improvements and to seek stakeholder input. The proposed improvements will be provided to the Commission in early January 1999 for approval. The assessment process improvements will be directed at increasing the use of objective, risk-informed (where possible) performance indicators in the NRC assessment process. This will decrease subjectivity, add objective indicators, and increase safety focus. This will also reduce the emphasis on enforcement actions. The goal is to reduce the influence of enforcement actions on the assessment process such that enforcement actions would override performance indicator results in only very limited circumstances.

Question 50. (B) Does the NRC's process eliminate the "Watch List" as it currently exists?

Response. The effectiveness of the NRC "Watch List" is being evaluated. It is possible that the proposal in early January 1999 will include a recommendation to either modify or eliminate the "Watch List," but the Commission has not yet made this decision.

Question 50. (C) Will the revised assessment process change the NRC's inspection and enforcement processes to improve the safety focus of each of these oversight activities? If so, please describe the contemplated changes.

Response. Review efforts are underway to identify improvements to the inspection and enforcement processes that will increase their safety focus. Changes to the NRC's inspection and enforcement process will be coordinated with changes to the assessment process to improve the safety focus and integration of all three processes. Changes being contemplated include developing and implementing a risk-informed baseline inspection program and improving the safety focus of NRC violations. (See question 27 for an additional discussion on the possible changes to the NRC programs and procedures.)

Question 51. We understand that the NRC's initial proposal for its revised assessment process included review of licensee management effectiveness. Among the items cited for review were "organizational environment, shared perception of the organization including the traditions, values, customs, practices and socialization processes." Although the review of these features is not explicitly included in the revised assessment approved for public comment, SECY 98-045 states that the staff intends to continue to assess ways to evaluate management effectiveness.

What NRC regulation requires it to review licensee management effectiveness?

Response. The NRC's regulations do not explicitly require the evaluation of plant management.

After several recent reviews of this area, the NRC has decided that it will continue its practice of conducting performance-based inspections by observing the conduct of operations, the material condition of the plant, the performance of licensee personnel, the quality of engineering work, and the licensee's performance in problem identification and resolution. The NRC will continue to examine operational events to identify root causes, such as human error, design deficiencies, and administrative controls. The process for assessing plant performance will continue to be based on inspection findings, enforcement actions, operational events, and performance indicators. It has been and will remain the NRC's practice to conduct performance-based inspections in all areas of facility operation and design and, on the basis of the inspection results, to draw conclusions about the effectiveness of the licensee's management to the extent that it relates to safe operation of the facility.

In its May 30, 1997, report entitled, "Nuclear Regulation: Preventing Problem Plants Requires More Effective NRC Action," the General Accounting Office (GAO) stated that NRC does not have an effective process for ensuring that licensees maintain competent management in their nuclear plants. In addition, the GAO recommended that the assessment of management's competency and performance be a mandatory component of NRC's inspection process.

In response to the GAO report and as part of the NRC's effort to improve the Senior Management Meeting process, the staff investigated the development of manage-

ment performance assessment tools for improving the current plant performance evaluation methodology as stated in SECY 98-045. This effort included two one-week-long workshops in August 1997 and December 1 1997 involving NRC staff and experts from the research community. While the consensus of the workshop participants was that management and organizational factors do influence human performance and hardware operation, it was also decided that a management assessment based on the current inspection program data would not likely result in a leading indicator of plant performance or in a comprehensive and direct assessment of licensee management performance.

On March 26, 1998, the staff proposed to the Commission in SECY-98-059, five options for assessing the performance and competency of licensee management and delineated associated policy issues for the Commission's consideration and comment. This paper followed up on the views expressed in the staff's earlier paper, SECY-98-045. The options were summarized as follows:

1. Continue to conduct performance-based inspections in all areas of facility operation design; however, do not attempt to infer or articulate conclusions regarding the performance or competency of licensee management.
2. Infer licensee management performance from the results of the current performance-based inspection program on overall plant performance. Strengthen guidance to improve the quality and consistency of the management performance assessment.
3. Assess the performance of licensee management through targeted operational performance inspections using specific inspection procedures, trained staff, and contractors.
4. Assess the performance of licensee management by evaluating and documenting management performance attributes as part of the routine inspection program. Implement the necessary regulations. Revise the inspection, staff training, and qualification programs accordingly.
5. Assess the competency of licensee management by evaluating management competency attributes using specific inspection procedures, trained staff, and contractors. Implement the necessary regulations. Revise the inspection, staff training, and qualification programs accordingly.

After considering the five options contained in SECY-98-059, the Commission approved only those elements of Option 2 associated with the current staff practice of inferring licensee management performance from performance-based inspections, routine assessments, and event followup. The Commission also determined that efforts to develop leading indicators of performance should not use licensee management performance or competency as an input, and that the inspection program should focus on performance-based inspection findings. In addition, the Commission approved the elimination of any fiscal year 1998 resource expenditures specifically directed toward developing a systematic method of assessing management performance and disapproved any use of fiscal year 1999 or fiscal year 2000 resources for these purposes.

As a result, the NRC staff is currently implementing the inspection program as outlined, in part, by Option 2, which requires no additional inspection effort or resources above those required for implementing the original inspection program. The NRC staff will continue its practice of conducting performance-based inspections by observing the conduct of operations, the material condition of the plant, the performance of licensee personnel, the quality of engineering work, and the licensee's performance in problem identification and resolution. The NRC will continue to examine operational events to identify root causes, such as human error, design deficiencies, and administrative controls. The process for assessing plant performance will continue to be based on inspection findings, enforcement actions, operational events, and performance indicators. It has been and will remain the NRC's practice to conduct performance-based inspections in all areas of facility operation and design and, on the basis of the inspection results, to draw conclusions about the effectiveness of the licensee's management to the extent that it relates to safe operation of the facility.

Finally, the NRC staff is currently exploring improvements to the process for assessing plant performance. This effort is known as the integrated review of the assessment process (IRAP). A trial application of this process was conducted in the spring of 1998 and utilized an updated version of the NRC Plant Performance Template, which consisted of five performance categories (see response to GAO Recommendation 2, dated January 28, 1998). However, the assessment area regarding management effectiveness was not included on the basis of the Commission's approval of only those elements of Option 2 associated with the current staff practice of inferring licensee management performance. The staff will continue using the NRC Plant Performance Template for the evaluation of the remaining five perform-

ance categories and the results will be discussed during public workshops scheduled for the fall of 1998.

Question 52. In addition, the NRC stated in response to Congressman Schaefer's questions that the staff has identified "regulatory excellence strategies" to improve the NRC's regulatory program.

(A) Please list each regulation eliminated or modified under these programs since 1990.

Response. Prior to 1992 the NRC did not categorize rulemakings as to whether they might be safety enhancements or promulgated to provide additional regulatory flexibility or burden relief. However, what follows is a list of rulemakings specifically focused on providing power reactor licensees with additional regulatory flexibility and burden relief. Over that same period, 1992 through 1997, the NRC promulgated approximately 50 rulemakings affecting nuclear power reactor licensees. 45 Hence, as can be seen from the list below, about half of NRC's reactor rulemaking effort is directed at regulatory flexibility and burden relief.

BURDEN REDUCTION/REGULATORY REFORM/ADDED FLEXIBILITY RULEMAKINGS
PUBLISHED FINAL IN:

1992

Frequency of Radiological Effluent Reports, Part 50.36a
Frequency of FSAR Updates, Part 50.71
Frequency of Design Change Reports, Part 50.59
Use of Fuel with Zirconium Based Cladding, Part 50.44, 50.46, Appendix K
Partial Withdrawal of NRC Information Collection Requirements for Fitness For Duty Programs, Part 26
Disposal of Waste Oil by Incineration

1993

Monitoring the Effectiveness of Maintenance at Nuclear Power Plants, Part 50.65a.3

1994

Changes to Random Testing Rates for Fitness to Duty Programs, Part 26
Renewal of Licenses and Requalification Requirements for Licensed Operators, Part 55

1995

License Renewal, Part 54
License Renewal for NPPs; Scope of Environmental Effects, Part 51
Procurement of Commercial Grade Items by Nuclear Power Plant Licensees, Part 21
Performance-Based Primary Reactor Containment Leakage Testing for Water-Cooled Power Reactors, Part 50) (Part 50, Appendix J. Option B)
Change To Nuclear Power Reactor Security Requirements Associated With Containment Access Control, Part 73.55 (d)(8)
Physical Security Plan Format Changes, Parts 50, 70
Incorporate TS Criteria, Part 50.36
Radiation Protection Requirements; Amended Definitions and Criteria, Parts 19, 20

1996

Codes and Standards for Nuclear Power Plants (ASME Code, Section XI, Division 1 Subsection IWE and Subsection IWL), Part 50
Constraint Level for Air Emissions of Radionuclides, Part 20
Decommissioning of Nuclear Power Reactors, Part 50
Reactor Site Criteria; Including Seismic and Earthquake Engineering Criteria for Nuclear Power Plants, Parts 50, 52, 100

1997

Reduction In Nuclear Power Reactor Security Requirements Associated With Insider Threat, Part 73.55
Design Certification for Advanced Boiling Water Reactor (ABWR) AND SYSTEM 80+, Part 52
Radiological Criteria for License Termination of Nuclear Facilities, Parts 20, 30, 40, 50, 51, 70, 72

1998

Revision to Nuclear Power Reactor Decommissioning Financial Assurance Implementation Requirements, 10 CFR 50.2 and 10 CFR 50.75 final rule sent to the Federal Register for publication—week of September 21, 1998

Audit Frequency for Emergency Planning and Security, Part 50, PRM-50-59, PRM-50-60 final rule to be sent to the Federal Register for publication by December 1998

Question 52. (B) Please describe in detail the actions that have been taken as a result of the implementation of the "regulatory excellence strategies."

Response. In April 1998, the NRC staff presented to the Commission a draft Excellence Plan describing in detail 13 strategies intended to improve the effectiveness and efficiency of the NRC. The Commission considered that, in light of the changes in the NRC's planning, budgeting, and performance management process that have occurred as a result of the Government Performance and Results Act of 1993, there was no need to maintain the Excellence Plan as a separate formal agency document. The staff was directed to "sunset" this plan as a separate document, and activities from these strategies were integrated into the various operating plans of the organizational entities responsible for each strategy.

Consistent with this approach and the description of the strategies in the draft Excellence Plan, significant activities are ongoing in the following areas:

- Improvement of the reactor inspection program
- Improvement of the licensing support and regulatory oversight of operating reactors
- Use of risk insights to enhance safety decision making, make more efficient use of NRC resources, and reduce burden on licensees 46
- Improvement of the medical regulatory program by modifying 10 CFR Part 35 to be more risk-informed and performance based
- Development of a process to identify candidate issues for improving the effectiveness and efficiency of rules, standards, regulatory guidance, and their application
- Increase in the effectiveness and efficiency of the regulatory process by expediting evaluation of industry initiatives and promoting more rapid adoption of consensus standards
- Assessment of core capability needs by comparing requirements to current availability
- Assessment of the effectiveness, including integration and data sharing, of information systems supporting NRC's major business areas
- Improvement of the information systems supporting resource management (STARFIRE)
- Improvement of information systems supporting document and records management (ADAMS)
- Improvement of information systems supporting the reactor inspection and licensing programs (Reactor Program System—RPS)

Question 53. In response to a question by Congressman Schaefer, the NRC stated that there is an initiative to transition to more risk-informed and, when appropriate, performance based regulatory approaches. What has the agency done to apply risk information to add, remove or modify NRC regulations? Please list all regulations that have been added, removed or modified using this process since 1990? 1994?

Response. Since the first nuclear reactor PRAs, the NRC has increasingly used risk information to prioritize and resolve safety issues and has issued reactor-related regulations directly related to risk insights: requirements for reduction of risk from anticipated transients without scram events for light-water-cooled nuclear power plants (10 CFR 50.62, April 1989) and loss of alternating current power (10 CFR 50.63, June 1988). PRA played a key role in the System 80+ and ABWR designs, for which standard design certifications were issued (Appendices A and B to 10 CFR Part 52, May 1997). In 1995, the Commission issued a policy statement to declare the agency's commitment to increased use of PRA methods and insights in its reactor regulatory activities. The NRC has taken a risk-informed or performance-based approach in the following reactor-related rulemakings: promulgation of performance-based containment leakage testing requirements (10 CFR 50 Appendix J, option B, September 1995), requirements for monitoring the effectiveness of maintenance at nuclear power plants (10 CFR 50.65, July 1996), changes to the required frequency of FSAR updates (10 CFR 50.71 (e)(4), August 1992), and technical specifications (10 CFR 50.36(c)(2)(ii)(D), July 1996).

In the materials area, the NRC used risk information in 1990 to develop its policy on Below Regulatory Concern, whose purpose was to reduce burdens on industry

while continuing to protect public health and safety. (This policy was later rescinded at the direction of Congress.)

The Commission is working to achieve an appropriate balance between deterministic and risk-informed regulations and between prescriptive and performance-based regulations. The overarching 10 CFR Part 20, "Standards for Protection against Radiation," contains quantitative radiation protection standards that apply to all licensees. These standards establish limits on allowable doses (which can be converted to risk) and are implemented using a fundamentally performance-based approach. Thus, the central standards on which all nuclear materials regulation is ultimately based are implemented at a first level using a risk-informed, performance-based regulatory approach. There have been several revisions to 10 CFR Part 20, which are risk-informed and performance based. These include revision to the criteria for the safe release from hospitals of individuals who have been administered radioactive material, revision of the monitoring criteria for declared pregnant workers and minors, and radiological criteria for decontamination and decommissioning.

Recent revisions to 10 CFR Parts 34, "Licenses for Industrial Radiography and Radiation Safety Requirements for Industrial Radiographic Operations," and 36, "Licenses and Radiation Safety Requirements for Irradiators," were developed using risk information. In addition the Commission, in revising 10 CFR Part 35, "Medical Uses of Byproduct Material," is restructuring it into a risk-informed, more performance-based regulation. Modifications to Part 39, "Licenses and Radiation Safety Requirements for Well Logging," using risk information are currently ongoing to address newer technology. For some uses of byproduct material, such as radiography, medical uses, irradiators, and well logging, there is both a potential for and a history of overexposures. Therefore, while these regulations are risk-informed, there are situations that require prescriptive requirements for higher risk activities.

The following materials-related regulations were published between 1990 and 1993:

Title	Publication Date	FRN Notice
Use and Preparation of Radiopharmaceuticals For Diagnosis, Therapy, or Medical Research (Interim Rule)	8/23/90	55 FR 34513
Standards for Protection Against Radiation (Part 20)	5/21/91	56 FR 23360
Twenty-Four Hour Notification of Incidents For Non-Reactors	8/16/91	56 FR 40757
Licenses and Radiation Safety Requirements for Large Irradiators	2/09/93	58 FR 7715

The following materials-related regulations have been published since 1994:

Title	Publication Date	FRN Notice
Change to Part 40, Appendix A Uranium Tailings Regulation; Conforming NRC Requirements to EPA Standards	6/01/94	59 FR 28220
Use And Preparation of Radiopharmaceuticals For Diagnosis Therapy, or Medical Research	12/02/94	59 FR 61767
Notification of Incidents or Accidents, 10 CFR Part 72	12/14/94	59 FR 64283
Preparation, Transfer for Commercial Distribution, and Use of Byproduct Material for Medical Use, Revised Final Rule, Part 32	1/04/95	60 FR 322
Administration of Radiopharmaceuticals to The Wrong Patient, Part 35	9/20/95	60 FR 48612
Criteria For Release of Patients Administered Byproduct Material 10 CFR Parts 20 and 35	1/29/97	62 FR 4120
Radiography and Radiation Safety Requirements For Radiography Operations, Revision To 10 CFR Part 34	5/28/97	62 FR 28948
Radiological Criteria For Decommissioning	7/21/97	62 FR 39058
Medical Use of Carbon-14 For the Detection of Helicobacter Pylori-RM#432	12/2/97	62 FR 63634
Requirements for Shipping Packages Used to Transport Vitrified Wastes Containing PU [Part 71]	6/15/98	63 FR 32600
Revision of Prototype Testing Requirements for Watches Containing Tritium [S3214]	6/17/98	63 FR 32969

Title	Publication Date	FRN Notice
Minor corrections, clarifying changes and a minor policy change [Part 20]	7/23/98	63 FR 39477

Question 54. The NRC has stated that where requirements exist that have no safely benefit, are duplicative, unnecessary or unnecessarily burdensome, the NRC can and should take action to modify or remove such requirements.

Will the NRC conduct a review of each of its regulations to identify those that should be eliminated based upon the above criteria?

Response. Over the past several years, the NRC has conducted a number of regulatory and burden reduction rulemakings in several areas including license renewal, decommissioning, and standard design certification. However, at present resources do not permit the NRC to undertake a systematic section-by-section assessment and 48 possible revision of its portion of Title 10 of the Code of Federal Regulations. Nevertheless, the NRC remains committed to continuing efforts to modify or eliminate regulations to improve safety, reduce unnecessary licensee burden and improve staff efficiency; for example, the ongoing revisions of 10 CFR 50.59 and Part 35 and use of a revised source term. The Commission recently increased rulemaking resources available to the Office of Nuclear Reactor Regulation (NRR) in the revised fiscal year 1999 and the proposed fiscal year 2000 budgets to increase burden reduction rulemakings. Accordingly, the NRC intends to continue discussions and seek new opportunities to work with the industry on regulatory requirements which may need reevaluation as potential candidates for burden relief.

Question 55. The NRC recently issued the results of a survey on NRC safety culture and climate. Some of the information obtained through that survey seems to indicate that the Commission and senior management does not have the full support of the staff in many of the important initiatives the Commission has identified as top priorities. For example, only 32 percent of NRC employees believe that the agency's increased focus on risk-informed performance based regulation would improve the agency's regulatory effectiveness.

(A) What steps will the Commission take to obtain the support of NRC staff in order to carry out the Commission's stated intent to focus on risk-informed performance based regulation?

(B) What steps will the Commission take to address the fact that only 25 percent of NRC employees believe that NRC senior management is doing a good job in implementing programs and processes for improving regulatory effectiveness?

(C) What steps will the Commission take to address the fact that only 24 percent of NRC employees believe that NRC senior management is doing a good job in providing the tools and resources required for improving regulatory effectiveness?

(D) What steps will the Commission take to address the fact that only 15 percent of NRC employees believe that NRC senior management is doing a good job of using employee input to improve regulatory effectiveness? (E) What steps will the Commission take to address the fact that only 20 percent of NRC employees believe that NRC senior management is doing a good job "leading by example" in the area of regulatory effectiveness?

Response. We recognize that the support and endorsement of the NRC staff will be critical to success in implementation of more risk-informed and performance-based regulation. Our implementation plans in this regard will focus on clear and extensive communication between staff and management and solicitation of staff input on effective implementation strategies.

The results of the safety culture and climate survey were only recently presented to the staff by the Inspector General's (IG's) contractor. The staff has been reviewing the individual results and the Executive Director for Operations has directed that a plan of action be formulated by the end of this year. An interim review is scheduled for the end of October and Office Directors and Regional Administrators have been asked to provide input by the end of September. We are currently developing an internal communications plan which has as its primary goals, communicating the need for change and soliciting active interaction and participation by the staff in the change process.

Clearly, the broad implications of the survey are that NRC senior managers have a substantial challenge ahead to engage the staff in meaningful improvements to regulatory effectiveness.

Question 56. The NRC has been subjected to significant criticism for the length of time it has taken to render decisions in licensing actions. The Louisiana Enrichment Services, L.P. (LES) application for a uranium enrichment facility license is a recent example of the breakdown of the NRC's licensing process. As a result of delay in the NRC licensing process, LES recently withdrew its license application after spending more than \$30 million to prepare and process it and participating in the licensing process for more than 7 years. The NRC's failure to resolve LES's licensing issues in a timely manner occurred despite the fact that Congress had amended the Atomic Energy Act specifically to mandate the use of a streamlined, one stage licensing process for uranium enrichment facilities like the one proposed by LES. Given that there are now license renewal applications being submitted, we are very concerned that the same delays not be experienced by those applicants.

(A) What action will the NRC take to address the obvious need to reform its licensing process so that future license applicants will not be subjected to the same delays and lack of discipline experienced by LES?

Response. The slow pace and delays that characterized the Louisiana Energy Services (LES) proceeding had many causes. In retrospect it is clear that in several 49 ways the NRC could have done a more efficient job. The Commission through its July 28, 1998, "Statement of Policy on Conduct of Adjudicatory Proceedings" (enclosed) has taken initial action to ensure that the licensing process will function more effectively in future proceedings of this nature, and the Commission plans further steps, described later in this response.

Nevertheless, the problems that delayed LES cannot all be attributed to "lack of discipline" or defects in the licensing process. The LES proceeding involved a first-of-a-kind application for a private enrichment facility, involving a technology which had not previously been licensed by the Commission. New standards for decision had to be established by the Commission at the outset, and it turned out that these were not always easy to apply. During both the technical review and adjudicatory process, a number of novel legal and technical issues had to be addressed. Setting more precise standards and providing clearer guidance at the beginning would have reduced subsequent litigative controversy. These needs are now recognized, and the "lesson learned" will be applied in future licensing actions.

With respect to the staff's technical review in the LES proceeding, it is now apparent that the application submitted by LES was not sufficient to enable the staff's review to be conducted on a timely basis. While the NRC staff could have addressed the application's shortcomings more aggressively, the applicant was not fully responsive to staff requests for additional information.

In regard to the LES adjudicatory process, several issues of first impression were brought to the Commission's attention but were not always resolved in a timely manner. In addition, in an attempt to ensure that all issues were thoroughly addressed, the Licensing Board allowed a large amount of information into the record, without insisting on adequate sponsorship by the parties to explain the significance of that information. This material then had to be dealt with by the Board in reaching its decisions, which were in turn delayed. Even allowing for the complexity of the case, however, the Licensing Board's decisions in LES were excessively delayed, as the Licensing Board itself has acknowledged. Recent directives by the Chief Administrative Judge of the Atomic Safety and Licensing Board Panel that the Board's judges should not allow into evidence unsponsored and unexplained documents should substantially reduce this problem.

The Commission has attempted to address sources of potential delay in future licensing actions in several ways. The staff now prepares a detailed review schedule for significant licensing actions such as license renewal, including the need to ensure the adequacy of the license application itself and for bringing emerging technical issues to NRC management attention and, if necessary, to the Commission for guidance (both matters which also contributed to the delay of the LES proceeding). In addition, the Commission has moved to streamline the adjudicatory process, while still ensuring that a fair hearing is conducted and a clear and complete record is created. The Commission has commenced a study of the entire hearing process and expects to receive staff recommendations by the end of this year on specific changes that would make NRC proceedings more efficient and timely. The Commission expects that this study will specifically address the question of need for legislation to streamline the hearing process as well as the viability of rulemaking, without legislation, to streamline that process.

The NRC will seek legislation that supports the NRC's reading of section 189a of the Atomic Energy Act to reflect the reading that formal adjudications are not required. Further, with the anticipated application from USEC for the AVLIS uranium enrichment process expected early next year, the NRC will consider seeking legislation that would modify section 193's inflexible approach to hearings.

In the interim, as noted above, the Commission has developed and issued a "Statement of Policy on Conduct of Adjudicatory Proceedings" which provides guidance to the licensing boards and parties to Commission proceedings on how the Commission expects its proceedings to be conducted. The Policy Statement encourages licensing boards to establish and adhere to case-specific schedules, to shorten filing and response times where practical, to manage discovery to avoid unnecessary delays in that stage of the adjudicatory process, to make sure that the parties comply with the Commission's regulations governing the submission of admissible contentions, and to issue decisions in a timely manner. It also stresses the obligations of all parties to comply with the Commission's Rules of Practice as well as their other obligations as participants, such as, with respect to submitting contentions and offering evidence.

The Policy Statement further makes it clear that the Commission itself will carefully and actively monitor ongoing licensing proceedings to ensure that they are conducted expeditiously and that the boards, staff and other parties receive prompt guidance on emerging technical, policy and legal issues, as necessary. Consistent with the desire for expeditious processing of license applications, the Commission on August 19, 1998 issued an order giving guidance and recommending a schedule to the Licensing Board that will preside over the licensing renewal proceeding for the Calvert Cliffs Nuclear Power Plant. On September 15, 1998, the Commission issued a similar order to govern the license renewal proceeding for Oconee Nuclear Station, Units 1, 2 and 3. Moreover, the Commission has published a proposed rule that would establish new, informal procedures for license transfer hearings that could substantially reduce the time for such hearings.

ENCLOSURE: STATEMENT OF POLICY

UNITED STATES OF AMERICA NUCLEAR REGULATORY COMMISSION

COMMISSIONERS: SHIRLEY JACKSON, CHAIRMAN; NILS J. DIAZ; EDWARD MCGAFFIGAN, JR.

STATEMENT OF POLICY ON CONDUCT OF ADJUDICATORY PROCEEDINGS CLI-98-12

I. Introduction

As part of broader efforts to improve the effectiveness of the agency's programs and processes, the Commission has critically reassessed its practices and procedures for conducting adjudicatory proceedings, within the framework of its existing Rules of Practice in 10 C.F.R. Part 2, primarily Subpart G. With the potential institution of a number of proceedings in the next few years to consider applications to renew reactor operating licenses, to reflect restructuring in the electric utility industry, and to license waste storage facilities, such assessment is particularly appropriate ensure that agency proceedings are conducted efficiently and focus on issues germane to the proposed actions under consideration. In its review, the Commission has considered its existing policies and rules governing adjudicatory proceedings, recent experience and criticism of agency proceedings, and innovative techniques used by our own hearing boards and presiding officers and by other tribunals. Although current rules and policies provide means to achieve a prompt and fair resolution of proceedings, the Commission is directing its hearing boards and presiding officers to employ certain measures described in this policy statement to ensure the efficient conduct of proceedings.

The Commission continues to endorse the guidance in its current policy, issued in 1981, on the conduct of adjudicatory proceedings. Statement of Policy on Conduct of Licensing Proceedings, CLI-81-8, 13 NRC 452 (May 20, 1981); 46 Fed. Reg. 28, 533 (May 27, 1981). The 1981 policy statement provided guidance to the Atomic Safety and Licensing Boards (licensing boards) on the use of tools, such as the establishment and adherence to reasonable schedules and discovery management, intended to reduce the time for completing licensing proceedings while ensuring that hearings were fair and produced adequate records. Now, as then, the Commission's objectives are to provide a fair hearing process, to avoid unnecessary delays in the NRC's review and hearing processes, and to produce an informed adjudicatory record that supports agency decision making on matters related to the NRC's responsibilities for protecting public health and safety, the common defense and security, and the environment. In this context, the opportunity for hearing should be a meaningful one that focuses on genuine issues and real disputes regarding agency actions subject to adjudication. By the same token, however, applicants for a license are also entitled to a prompt resolution of disputes concerning their applications. The Commission emphasizes its expectation that the boards will enforce adherence to the hearing procedures set forth in the Commission's Rules of Practice in 10

C.F.R. Part 2, as interpreted by the Commission. In addition, the Commission has identified certain specific approaches for its boards to consider implementing in individual proceedings, if appropriate, to reduce the time for completing licensing and other proceedings. The measures suggested in this policy statement can be accomplished within the framework of the Commission's existing Rules of Practice. The Commission may consider further changes to the Rules of Practice as appropriate to enable additional improvements to the adjudicatory process.

II. Specific Guidance

Current adjudicatory procedures and policies a latitude to the Commission, its licensing boards and presiding officers to instill discipline in the hearing process and ensure a prompt yet fair resolution of contested issues in adjudicatory proceedings. In the 1981 policy statement, the Commission encouraged licensing boards to use a number of techniques for effective case management including: setting reasonable schedules for proceedings; consolidating parties; encouraging negotiation and settlement conferences; carefully managing and supervising discovery; issuing timely rulings on preheating matters; requiring trial briefs, prefiled testimony, and cross-examination plans; and issuing initial decisions as soon as practicable after the parties file proposed findings of fact and conclusions of law. Licensing boards and presiding officers in current NRC adjudications use many of these techniques, and should continue to do so.

As set forth below, the Commission has identified several of these techniques, as applied in the context of the current Rules of Practice in 10 C.F.R. Part 2, as well as variations in procedure permitted under the current Rules of Practice that licensing boards should apply to proceedings. The Commission also intends to exercise its inherent supervisory authority, including its power to assume part or all of the functions of the presiding officer in a given adjudication, as appropriate in the context of a particular proceeding. See, e.g., Public Service Co. of New Hampshire (Seabrook Station, Units 1 and 2), CLI-9-3, 31 NRC 219, 229 (1990). The Commission intends to promptly respond to adjudicatory matters placed before it, and such matters should ordinarily take priority over other actions before the Commissioners.

1. Hearing Schedules

The Commission expects licensing boards to establish schedules for promptly deciding the issues before them, with due regard to the complexity of the contested issues and the interests of the parties. The Commission's regulations in 10 C.F.R. §2.718 provide licensing boards all powers necessary to regulate the course of proceedings, including the authority to set schedules, resolve discovery disputes, and take other action appropriate to avoid delay. Powers granted under section 2.718 are sufficient for licensing boards to control the supplementation of petitions for leave to intervene or requests for hearing, the filing of contentions, discovery, dispositive motions, hearings, and the submission of findings of fact and conclusions of law.

Many provisions in Part 2 establish schedules for various filings, which can be varied "as otherwise ordered by the presiding officer." Boards should exercise their authority under these options and 10 C.F.R. §2.718 to shorten the filing and response times set forth in the regulations to the extent practical in a specific proceeding. In addition, where such latitude is not explicitly afforded, as well as in instances in which sequential (rather than simultaneous) filings are provided for, boards should explore with the parties all reasonable approaches to reduce response times and to provide for simultaneous filing of documents.

Although current regulations do not specifically address service by electronic means, licensing boards, as they have in other proceedings, should establish procedures for electronic filing with appropriate filing deadlines, unless doing so would significantly deprive a party of an opportunity to participate meaningfully in the proceeding. Other expedited forms of service of documents in proceedings may also be appropriate. The Commission encourages the licensing boards to consider the use of new technologies to expedite proceedings as those technologies become available.

Boards should forego the use of motions summary disposition, except upon a written finding that such a motion will likely substantially reduce the number of issues to be decided, or otherwise expedite the proceeding. In addition, any evidentiary hearing should not commence before completion of the staff's Safety Evaluation Report (SER) or Final Environmental Statement (FES) regarding an application, unless the presiding officer finds that beginning earlier, e.g., by starting the hearing with respect to safety issues prior to issuance of the SER, will indeed expedite the proceeding, taking into account the effect of going forward on the staff's ability to complete its evaluations in a timely manner. Boards are strongly encouraged to expedite the issuance of interlocutory rulings. The Commission further strongly en-

courages presiding officers to issue decisions within 60 days after the parties file the last pleadings permitted by the board's schedule for the proceeding.

Appointment of additional presiding officers or licensing boards to preside over discrete issues simultaneously in a proceeding has the potential to expedite the process, and the Chief Administrative Judge of the Atomic Safety and Licensing Board Panel (ASLBP) should consider this measure under appropriate circumstances. In doing so, however, the Commission expects the Chief Administrative Judge to exercise the authority to establish multiple boards only if: (1) the proceeding involves discrete and severable issues; (2) the issues can be more expeditiously handled by multiple boards than by a single board; and (3) the multiple boards can conduct the proceeding in a manner that will not unduly burden the parties. *Private Fuel Storage, L.L.C. (Private Fuel Storage Facility)*, CLI-9-7, 47 NRC—(1998).

The Commission itself may set milestones for the completion of proceedings. If the Commission sets milestones in a particular proceeding and the board determines that any single milestone could be missed by more than 30 days, the licensing board must promptly so inform the Commission in writing. The board should explain why the milestone cannot be met and what measures the will take insofar as is possible to restore the proceeding to the overall schedule.

2. Parties' Obligations

Although the Commission expects its licensing boards to set and adhere to reasonable schedules for the various steps in the hearing process, the Commission recognizes that the boards will be unable to achieve the objectives of this policy statement unless the parties satisfy their obligations. The parties to a proceeding, therefore, are expected to adhere to the timeframes specified in the Rules of Practice in 10 C.F.R. Part 2 for filing and the scheduling orders in the proceeding. As set forth in the 1981 policy statement, the licensing boards are expected to take appropriate actions to enforce compliance with these schedules. The Commission, of course, recognizes that the boards may grant extensions of time under some circumstances, but this should be done only when warranted by unavoidable and extreme circumstances.

Parties are also obligated in their filings before the board and the Commission to ensure that their arguments and assertions are supported by appropriate and accurate references to legal authority and factual basis, including, as appropriate, citation to the record. Failure to do so may result in material being stricken from the record or, in extreme circumstances, in a party being dismissed.

3. Contentions

Currently, in proceedings governed by the provisions of Subpart G, 10 C.F.R. §2.714(b)(2)(iii) requires that a petitioner for intervention shall provide sufficient information to show that a genuine dispute exists with the applicant on a material issue of law or fact.³ The Commission has stated that a board may appropriately view a petitioner's support for its contention in a light that is favorable to the petitioner, but the board cannot do so by ignoring the requirements set forth in section 2.714(b)(2). *Arizona Public Service Co. (Palo Verde Nuclear Generating Station, Units 1, 2, and 3)*, CLI-91-12, 34 NRC 149, 155 (1991). The Commission reemphasizes that licensing boards should continue to require adherence to section 2.714(b)(2), and that the burden of coming forward with admissible contentions is on their proponent. A contention's proponent, not the licensing board, is responsible for formulating the contention and providing the necessary information to satisfy the basis requirement for the admission of contentions in 10 C.F.R. §2.714(b)(2). The scope of a proceeding, and, as a consequence, the scope of contentions that may be admitted, is limited by the nature of the application and pertinent Commission regulations. For example, with respect to license renewal, under the governing regulations in 10 C.F.R. Part 54, the review of license renewal applications is confined to matters relevant to the extended period of operation requested by the applicant. The safety review is limited to the plant systems, structures, and components (as delineated in 10 C.F.R. §54.4) that will require an aging management review for the period of extended operation or are subject to an evaluation of time-limited aging analyses. See 10 C.F.R. §§ 54.21 (a) and (c), 54.29, and 54.30. In addition, the review of environmental issues is limited by rule by the generic findings in NUREG-1427,

³ "[A]t the contention filing stage, the factual support necessary to show that a genuine dispute exists need not be in affidavit or formal evidentiary form and need not be of the quality necessary to withstand a summary disposition motion". Rules of Practice for Domestic Licensing Proceedings—Procedural Changes in the Hearing Process, Final Rule, 64 Fed. Reg. 33, 168, 33, 171 (Aug. 11, 1989).

"Generic Environmental Impact Statement [GEIS] for License Renewal of Nuclear Plants." See 10 C.F.R. §§55.71(d) and 51.95(c).

Under the Commission's Rules of Practice, a licensing board may consider matters on its motion only where it finds that a serious safety, environmental, or common defense and security matter exists. 10 C.F.R. §2.760a. Such authority is to be exercised only in extraordinary circumstances. If a board decides to raise matters on its own initiative, a copy of its ruling, setting forth in general terms its reasons, must be transmitted to the Commission and the General Counsel. Texas Utilities Generating Co. (Comanche Peak Steam Electric Station, Units and 2), CLI-81-24, 14 NRC 614 (1981). The board may not proceed further with *sua sponte* issues absent the Commission's approval. The scope of a particular proceeding is limited to the scope of the admitted contentions and any issues the Commission authorizes the board to raise *sua sponte*.

Currently, 10 C.F.R. § 2.714a allows a party to appeal a ruling on contentions only if (a) the order wholly denies a petition for leave to intervene (i.e., the order denies the petitioner's standing or the admission of all of a petitioner's contentions) or (b) a party other than the petitioner alleges that a petition for leave to intervene or a request for a hearing should have been wholly denied. Although the regulation reflects the Commission's general policy to minimize interlocutory review, under this practice, some novel issues that could benefit from early Commission review will not be presented to the Commission. For example, matters of first impression involving interpretation of 10 C.F.R. Part 54 may arise as the staff and licensing board begin considering applications for renewal of power reactor operating licenses. Accordingly, the Commission encourages the licensing boards to refer rulings or certify questions on proposed contentions involving novel issues to the Commission in accordance with 10 C.F.R. §2.730(f) early in the proceeding. In addition, boards are encouraged to certify novel legal or policy questions related to admitted issues to the Commission as early as possible in the proceeding. The Commission may also exercise its authority to direct certification of such particular questions under 10 C.F.R. §2.718(i). The Commission, however, will evaluate any matter put before it to ensure that interlocutory review is warranted.

4. Discovery Management

Efficient of the pretrial discovery process is critical to the overall progress of a proceeding. Because a great deal of information on a particular application is routinely placed in the agency's public document rooms, Commission regulations already limit discovery against the staff. See, e.g., 10 C.F.R. §§2.720(h), 2.744. Under the existing practice, however, the staff frequently agrees to discovery without waiving its rights to object to discovery under the rules, and refers any discovery requests it finds objectionable to the board for resolution. This practice remains acceptable.

Application in a particular case of procedures similar to provisions in the 1993 amendments to Rule 26 of the Federal Rules of Civil Procedure or informal discovery can improve the efficiency of the discovery process among other parties. The 1993 amendments to Rule 26 provide, in part, that a party shall provide certain information to other parties without waiting for a discovery request. This information includes the names and addresses, if known, of individuals likely to have discoverable information relevant to disputed facts and copies or descriptions, including location, of all documents or tangible things in the possession or control of the party that are relevant to the disputed facts. The Commission expects the licensing boards to order similar disclosure (and pertinent updates) if appropriate in the circumstances of individual proceedings. With regard to the staff, such orders shall provide only that the staff identify the witnesses whose testimony the staff intends to present at hearing. The licensing boards should also consider requiring the parties to specify the issues for which discovery is necessary; If this may narrow the issues requiring discovery.

Upon the board's completion of rulings on contentions, the staff will establish a case file containing the application and any amendments to it, and, as relevant to the application, any NRD report and any correspondence between the applicant and the NRC. Such a case file should be treated in the same manner as a hearing file established pursuant to 10 C.F.R. §2.1231. Accordingly, the staff should make the case file available to all parties and should periodically update it.

Except for establishment of the case file, generally the licensing board should suspend discovery against the staff until the staff issues its review documents regarding the application. Unless the presiding officer has found that starting discovery against the staff before the staffs review documents are issued will expedite the hearing, discovery against the staff on safety issues may commence upon issuance of the SER, and discovery on environmental issues upon issuance of the FES. Upon

issuance of an SER or FES regarding an application, and consistent with such limitations as may be appropriate to protect proprietary or other properly withheld information, the staff should update the case file to include the SER and FES and any supporting documents relied upon in the SER or FES not already included in the file.

The foregoing procedures should allow the boards to set reasonable bounds and schedules for any remaining discovery, e.g., by limiting the number of rounds of interrogatories or depositions or the time for completion of discovery, and thereby reduce the time spent in the pre-hearing stage of the hearing process. In particular, the board should allow only a single round of discovery regarding admitted contentions related to the SER or the FES, and the discovery respective to each document should commence shortly after its issuance.

III. Conclusion

The Commission reiterates its long-standing commitment to the expeditious completion of adjudicatory proceedings while still ensuring that hearings are fair and produce an adequate record for decision. The Commission intends to monitor its proceedings to ensure that they are being concluded in a fair and timely fashion. The Commission will take action in individual proceedings, as appropriate, to provide guidance to the boards and parties and to decide issues in the interest of a prompt and effective resolution of the matters set for adjudication.

Dated at Rockville, Maryland, this 28th day of July, 1998

For the Commission

ANNETTE VIETTI-COOK,
Assistant Secretary of the Commission.

Question 57. The NRC has been subjected to substantial criticism for its handling of the license transfer proceeding for Plant Vogtle. While we understand that some of the inordinate length of the Vogtle proceeding was due to the NRC Staff's on-going review of allegations, the fact remains that it took four and one-half years after the application was submitted for the license to be granted—and the proceeding actually was terminated without a decision by the Atomic Safety and Licensing Board through a settlement. We expect the rate of license transfer requests to increase as the electric utility industry, including the nuclear industry, begin operating in a competitive environment. For example, PECO Energy and British Energy recently announced plans to buy the Three Mile Island (TMI) nuclear plant. In approximately 90 days, PECO is expected to file with the NRC its application to transfer TMI's license to PECO. PECO has a long standing history of solid performance as nuclear licensee. Assuming that there is no public health and safety issue disclosed during the license transfer process, these facts would seem to suggest that the NRC could conduct a relatively speedy licensing process.

(A) Has the Commission issued guidance to the Atomic Safety and Licensing Board Panel directing Boards to limit the scope of license transfer, license amendment and license renewal proceedings to pertinent issues? Please provide the guidance.

Response. At present the Commission's adjudicatory proceedings for the transfer, amendment, or renewal of licenses are conducted pursuant to the Commission's Rules of Practice in 10 C.F.R. Part 2. In the event that a hearing request is filed by an intervenor, the Commission's regulations and practice require that the subject matter of the hearing be limited to issues that are pertinent to the licensing action under review. On July 28, 1998, the Commission issued a "Statement of Policy on Conduct of Adjudicatory Proceedings" (henceforth, "Policy Statement") In the Policy Statement, the Commission noted specifically with respect to license renewal:

"The scope of a proceeding, and, as a consequence, the scope of contentions that may be admitted, is limited by the nature of the application and the pertinent regulations. For example, with respect to license renewal, under the governing regulations in 10 C.F.R. Part 54, the review of license renewal applications is confined to matters relevant to the extended period of operation requested by the applicant. The safety review is limited to the plant systems, structures, and components (as delineated in 10 C.F.R. 54.4) that will require an aging management review of the period of extended operation or are subject to an evaluation of time-limited aging analyses. See 10 C.F.R. 54.21(a) and (c), 54.29 and 54.30. In addition, the review of environmental issues is limited by rule by the generic findings in NUREG-1427, "Generic Environmental Impact Statement (GEIS) for License Renewal of Nuclear Plants" See 10 C.F.R. §§55.71 (d) and 51.95(c).

Thus, the Commission has directed that the issues for hearing include only those necessary to resolve genuinely controverted issues of law and fact raised by the participants that are material to the Commission's ultimate decision whether to ap-

prove the application in question. The Policy Statement also reiterates limits on the Licensing Board's ability to introduce issues on their own by requiring Commission approval for the admission and litigation of such *sua sponte* issues.

The Commission also has the authority under existing statutes to issue an order approving a license transfer during the pendency of a hearing request. License amendments associated with a license transfer similarly may be issued and made effective prior to the completion of a hearing if the NRC makes a finding under section 189a.(I)(A) that the amendments involve "no significant hazards consideration."

On September 11, 1998, the Commission published in the Federal Register for a 30-day comment period a proposed rule that would establish new, informal procedures for license transfer hearings that, if promulgated as a final rule, could, in general, substantially reduce the time for such hearings.

Question 57. (B) Has the Commission issued any guidance to the Atomic Safety and Licensing Board Panel setting out schedules in licensing cases or directing Boards to do so? Please provide the guidance.

Response. The July 28, 1998 Policy Statement notes that "[t]he Commission expects licensing boards to establish schedules for promptly deciding the issues before them, with due regard to the complexity of the contested issues and the interests of the parties." Boards are encouraged to exercise their authority "to shorten the filing and response times set forth in the regulations 'to the extent practical in a specific proceeding.'" The Policy Statement also provides that the Commission itself may set milestones for the completion of proceedings and the Commission will monitor compliance with the milestone schedules. The Commission has taken this step in the license renewal proceeding recently initiated by the Baltimore Gas & Electric Company's application to renew the operating licenses for its Calvert Cliffs Nuclear Power Plant Units 1 and 2. In an order issued August 19, 1998, the Commission directed the Licensing Board to set a schedule for any hearing granted in this proceeding that will establish as a goal the issuance of a Commission decision on the pending application in about 2½ years from the time the application was received (April 1998). In this order, the Commission also provided guidance concerning specific milestones for the conclusion of significant steps in the adjudicatory proceeding. For example, the Commission directs the Licensing Board to complete its decision on intervention petitions and contentions within 90 days of the date of the Commission's order. The order then sets additional milestones in the event that a hearing is granted and further directs that "the Licensing Board should not grant requests for extensions of time absent unavoidable and extreme circumstances." Consistent with the Policy Statement, the Commission's order in the Calvert Cliffs license renewal proceeding directs the Licensing Board to inform the Commission promptly in writing if any single milestone could be missed by more than 30 days, together with an explanation why the milestone cannot be met and the measures the Board will take to restore the proceeding to the overall schedule. On September 15, 1998, the Commission issued a similar directive with regard to the licensing renewal proceeding for Oconee Nuclear Station, Units 1, 2, and 3.

Question 57. (C) What oversight process has the NRC established to ensure that Commission's scheduler directions are adhered to by Atomic Safety and Licensing Boards?

Response. The July 28, 1998, Statement of Policy declares:

The Commission itself may set milestones for the completion of proceedings. If the Commission sets milestones in a particular proceeding and the board determines that any single milestone could be missed by more than 30 days, the licensing board must promptly so inform the Commission in writing. The Board should explain why the milestone cannot be met and what measures the Board will take insofar as is possible to restore the proceeding to the overall schedule. In a case-specific order issued on August 19, 1998 in the Calvert Cliffs license renewal proceeding the Commission provided guidance regarding milestones for the conclusion of significant steps in the adjudicatory proceeding in the event that a hearing is granted and directed the Licensing Board to inform the Commission promptly if it appears that any single milestone could be missed by more than 30 days, to explain why the milestone cannot be met, and to specify the measures the Board will take to restore the proceeding to the overall schedule. (See the response to the previous question and attached order CLI-98-14).

In addition, agency adjudicatory proceedings are closely monitored by the Office of Commission Appellate Adjudication which may recommend issuance of Commission orders during the course of a proceeding to give the licensing board guidance.

Question 57. (D) Will the Commission review the performance of the Atomic Safety and Licensing Board Panel and its individual members? If such a review has been conducted, when was that review performed? What actions have been taken based upon the review?

Response. The Chairman, in consultation with the Commission, each year prepares the annual performance appraisal of the Chief Administrative Judge, Atomic Safety and Licensing Board Panel. To keep the Commission apprised of the Panel's activities, the Chief Administrative Judge prepares a written report for the Commission each month which provides the status of ongoing proceedings. In addition, the Chief Administrative Judge periodically meets with individual Commissioners, including the Chairman, to discuss procedural matters. Under the Administrative Procedure Act, discussion of substantive matters pending before a Licensing Board is generally barred in these meetings. The Commission, of course, acting in its adjudicatory capacity, has the opportunity to review each decision issued by a Licensing Board, provide guidance, and correct any errors. It would be inappropriate for the Commission to provide performance appraisals for Atomic Safety and Licensing Board members as this could be perceived as compromising the independence of our administrative judges, thereby reducing public confidence in the NRC licensing process. In 5 U.S.C. 4301(2)(d), Congress has exempted Administrative Law Judges from the performance appraisal requirement and the Commission has chosen to do the same for its Administrative Judges because they perform the same functions as Administrative Law Judges.

Question 57. (E) Please provide a schedule for completion of all changes the NRC will implement to ensure that its licensing process does not impede the business/corporate decisions made by nuclear utilities to address the competitive environment.

Response. On September 11, 1998, the Commission published in the Federal Register for a 30-day comment period a proposed rule that would establish new, informal procedures for license transfer hearings that could substantially reduce the time to complete such hearings. These procedures would be designed to provide for public input in the event of requests for a hearing on a license transfer application, while at the same time providing an efficient process that recognizes the time sensitivity and typical nature of the issues normally present in transfer cases.

Pursuant to the Commission's direction, the Office of the General Counsel (OGC) is also reviewing the entire hearing process to identify those areas where legislation might be needed or useful to address the hearing process and to identify additional areas for rulemaking to simplify and streamline the hearing process. OGC will forward its analysis and recommendations to the Commission by the end of 1998.

The NRC will seek legislation that supports the NRC's reading of section 189a of the Atomic Energy Act to reflect the reading that formal adjudications are not required. Further, with the anticipated application from USEC for the AVLIS uranium enrichment process expected early next year, the NRC will consider seeking legislation that would modify section 193's inflexible approach to hearings.

Question 58. (A) The NRC has participated in several pilot projects (ISI/IST) to apply risk insights. However, it has taken the NRC 4 years to develop implementation guidance for the application of the risk insights. The industry is concerned about the lack of timeliness on the part of the NRC. Please explain why it has taken more than 4 years to develop implementation guidance for these applications?

Response. As discussed in the response to question No. 24, the primary reason that the risk-informed pilot licensing activities have taken longer than other past pilot licensing activities is that they have been linked with the development of new NRC procedures and policies, which required resolution of number of complex and difficult technical issues applicable to all risk-informed licensing reviews. The most significant issues include: (1) developing a risk-informed framework and acceptance guidelines that could be applied in plant-specific licensing decisions, including the pilot applications; (2) defining and articulating the scope and quality of a PRA being used to support a licensing proposal; and (3) developing a practical approach to addressing uncertainty in PRAs. The process for resolving these issues included the development of candidate resolutions with recommendations by the NRC staff, review and consideration of the various options by the Commission and its independent advisory groups, and review and comment by the public. As regulatory positions were being established through this process, pilot licensees were asked to supplement their original proposals with information to address these positions. While this process has been time consuming, the NRC staff believes that it was necessary to ensure a coherent and predictable process for conducting licensing reviews that satisfied all of the objectives of the Commission's policy statement on the use of PRA,

i.e., to enhance the process for making safety decisions, to make more efficient use of agency resources, and to remove unnecessary burdens on licensees.

Question 58. (B) What actions will the NRC take to streamline its process for those applicants who seek to use the implementation guidance?

Response. The NRC committed to several actions to expedite the review process by increasing the priority for risk-informed licensing action reviews. Allocation of staff resources will be based on potential safety benefits of the action, and on potential savings of staff and licensee resources. In addition, a lead project manager for the coordination of risk-informed, performance-based licensing actions has been identified. This lead PM will identify, monitor, and coordinate risk-informed licensing actions; keep track of the review schedules; help identify problems that may require management attention; and coordinate followup actions (if any). Also, the management oversight steering committee has been reestablished to provide policy, technical, and priority guidance on risk-informed regulation. Finally, a risk-informed licensing panel is assisting in focusing management attention, as necessary, on risk-informed licensing actions. A schedule has been laid out for completing the most significant licensing reviews in the response to the Chairman's tasking memo.

Question 59. The NRC has been subjected to significant criticism regarding its failure to fully consider and apply the backfit rule as it develops and imposes staff positions, e.g., hot shorts, spurious actuations.

(A) How does the Commission ensure that NRC staff properly applies the backfit rule?

Response. The NRC has established procedures⁴ and programmatic controls to ensure that the staff properly applies the backfit rule for power reactors, Title 10, Code of Federal Regulations, Section 50.109 (10 CFR 50.109). For example, the Commission-approved Charter of the Committee to Review Generic Requirements (CRGR) establishes specific agency controls for generic backfitting actions (those that apply to multiple plants) and NRC Management Directive 8.4 (Manual Chapter 0514), "NRC Program for Management of Plant-Specific Backfitting of Nuclear Power Plants," establishes additional controls for plant-specific backfitting. Individual Offices and Regions are responsible for identifying and justifying potential generic and plantspecific backfits, before they are imposed. The Director of the Office for Analysis and Evaluation of Operational Data (AEOD) is responsible for oversight of the backfitting programs, including conducting audits, providing training and obtaining industry feedback on the effectiveness of the NRC's nuclear regulatory backfitting process.

The CRGR, an independent Committee of senior managers from several offices, reviews proposed generic backfits and provides a recommendation to the EDO as to whether the proposed actions should be issued, modified, or withdrawn. In addition, a key element to developing and imposing well justified generic requirements is openness and responsiveness to the stakeholders. Therefore, the NRC has implemented the practice of issuing proposed generic actions for public comment. The Commission urges stakeholders to actively participate in the public comment process for proposed generic actions. This is helpful to the NRC in developing carefully thought out, well justified, risk-informed, and less prescriptive regulatory requirements, since the staff must address public comments, modify the proposal as appropriate, and resubmit it for a formal review by the CRGR.

The CRGR submits an annual report to the Commission on the value added to the NRC mission by its activities, including the result of a self-assessment, and input from various stakeholders. This report includes the highlights of the CRGR members' visits to nuclear facilities to obtain feedback on how the backfitting process is working. This report also includes the highlights of the CRGR Chairman and staff periodic meetings with industry-supported organizations to obtain industry feedback on the effectiveness of the backfitting process.

⁴NUREG-1409, "Backfitting Guidelines," dated July 1990, contains staff guidance on implementing the requirements of 10 CFR 50.109. NRC backfitting procedures and staff guidance for generic communications are included, in the Commission-approved Charter of the Committee To Review Generic Requirements; NRC Inspection Manual—Manual Chapter 0720, "Nuclear Regulatory Commission Generic Communications Regarding Nuclear Reactor issues" (MC 0720); NRR Office Letter No. 500, Revision 2, "Procedures for Controlling the Development of New and Revised Generic Requirements for Power Reactor Licensees" (OL 500); and NRR Office Letter No. 503, "Procedures for Integrated Identification, Evaluation, Prioritization, Management, and Resolution of Generic Issues," (OL 503). NRR Office Letter No. 901, "Procedures for Managing Plant-Specific Backfits and 10 CFR 50.54(f) Information Request," contains individual office guidance, including management of the backfit appeal process. In addition, each Regional Office uses a formal procedure for controlling plant specific backfitting and handling of backfit appeals.

Notwithstanding the NRC backfit procedures and programmatic controls, the Commission has been made aware of industry concerns via the meetings with industry representatives discussed above. Some concerns result from the licensing review process through requests for additional information. Although specific details have not been provided, the general concern has been provided to senior managers in NRR who are responsible for ensuring that unauthorized plant specific backfits are not imposed in the licensing review process. Some concerns result from inspection activities. Last year, the Commission expanded the scope of the CRGR Charter to include review of inspection guidance. Some concerns arise because of industry misunderstanding regarding actions that are authorized (i.e., justified as an information request, a compliance backfit, and/or a cost-justified substantial safety improvement backfit). This indicates a need for additional workshops with industry representatives and, although such workshops are not currently scheduled, they will be planned in the near future. Currently an independent NRC panel is reviewing a formal backfit appeal from Maine Yankee, and recommendations for further improvements in the backfit management process may be forthcoming from that review. In early September, NRC and NEI Senior Managers met on issues of mutual interest, including the backfit rule. In addition the staff backfit training and audit activities which are planned for fiscal year 1999 may indicate additional specific areas in need of improvement. Where needed improvements are identified, we will take appropriate corrective action.

Regarding the examples cited, the generic technical and safety issues associated with hot shorts and spurious actuations are expressly covered by existing regulatory requirements. Specifically, the NRC regulatory requirements for fire protection address the potential for nuclear power plant fires to cause hot shorts and specify that such circuit failures shall not prevent the operation or cause the maloperation (spurious actuation) of components required to achieve safe shutdown. The NRC staff is working in cooperation with the Nuclear Energy Institute and other nuclear power industry representatives to resolve these issues. To date, these efforts have been within the scope of the existing regulation and have not resulted in any potential generic or plant-specific backfits. If future actions to fully resolve these issues involve potential backfits, the staff will follow its established backfitting procedures before they are imposed.

Question 59. (B) What programs are in place to train NRC personnel about the applicability and use of the backfit rule?

Response. Backfit training is included in the initial training and qualification of new resident inspectors. In addition, the AEOD staff has periodically provided backfit training to both the headquarters and the regional technical personnel and audited the plant-specific backfitting programs of their offices. Backfit training involved presentations and dialogue during seminars and regional inspector counter-part meetings. The training was reinforced by reviews of applicable regulation and staff guidance (e.g., the backfit rule (10 CFR 50.109) and NUREG-1409, "Backfitting Guidelines") and specific agency procedures (e.g., the CRGR Charter, NRR office procedures, and NRC Inspection Manual—Manual Chapter 0720), and by conducting four regional NRC-industry workshops on the backfitting process. Backfit audits involved an assessment of the backfitting practices of each region/office by detailed reviews of their records and by conducting interviews with the backfit coordinators and managers, including the Regional Administrators. A database of plant-specific backfits and backfit appeals is maintained and used to assist in auditing the process.

Backfit training for the headquarters staff was last conducted 4 years ago. Until fiscal year 1996, the regional periodic training and auditing were conducted annually; however, at that time it was decided that the objectives could be met by conducting these activities every other year. Because of resource constraints, the scheduled fiscal year 1998 regional training and auditing were not conducted. It is expected that the headquarters and the regional backfit training and audits will be completed during fiscal year 1999.

Question 59. (C) What action will the NRC take to ensure that the backfit appeal process provides an opportunity for an impartial review of the licensee complaint?

Response. The NRC urges licensees to exercise their right to appeal any action that they consider to be a backfit that was not identified and justified as such, or an identified backfit for which the justification is inadequate. However, in the past dozen years there have been very few appeals.

A plant-specific backfit appeal is reviewed by a panel appointed by the cognizant regional administrator or office director. The panel members are NRC managers who are knowledgeable of the backfitting process and the technical issues at hand,

and who have not been involved in the decision-making process involving the issue in question. The panel reviews the issue being appealed and provides its recommendation to the office director or regional administrator. In case of an unfavorable decision, the licensee may appeal to the EDO.

Generic backfits may be appealed to the Director of the Office of NRR or to the EDO. Typically, such an appeal would be referred to the CRGR to review the matter and provide a recommendation to the EDO.

The NRC is aware that power reactor licensees are generally hesitant to initiate a formal backfit appeal out of concern that doing so may adversely impact their relationship with the NRC. However, the NRC encourages the licensees to exercise the backfit appeal process, as it is an important and an integral part of the regulatory process. It can provide the NRC with valuable opportunities to address licensee concerns, assess adequacy and effectiveness of its own backfitting activities, sensitize the staff, and assure an effective backfit management process in the future. The EDO and the Office of the Inspector General stand ready to deal with any evidence that staff objectivity was affected by a licensee exercising their right to appeal the improper imposition of a new staff position or requirement.

Question 60. (A) How does the NRC ensure that when a staff member identifies an "agency position" it has been reviewed by senior NRC staff or the Commission?

Response. Documented products such as licensing actions and inspection reports receive management review prior to issuance. Part of this review is to ensure that any regulatory decision is consistent with agency direction, and that there are no new "agency positions." If individual reviews are raising concerns that are not documented and are new positions, the response that follows for part B of this question would be applicable.

Question 60. (B) What oversight mechanism has been established to ensure that licensees are not asked to take action beyond NRC regulatory requirements?

Response. The NRC has four processes that monitor concerns raised by licensees about pressures to take action beyond regulatory requirements. (1) Licensees can report concerns to NRC management during periodic site visits required by Inspection Manual Chapter (IMC) 0102, "Oversight and Objectivity of Inspectors and Examiners at Reactor Facilities." IMC 0102 requires NRC management to make periodic site visits to solicit feedback from their licensee counterparts regarding implementation of the NRC regulatory programs at their facility. Concerns raised by licensees during IMC 0102 visits are evaluated annually with the results reported to the Commission. (2) Each region has a formal process to evaluate and resolve licensees' complaints of inappropriate regulatory action by NRC employees. Each procedure requires a determination if the issue should be pursued by the Office of the Inspector General (OIG) or the region. For issues reviewed by the region, the regional administrator approves a course of action including any specific remedial actions. (3) If the issue is referred to the OIG, the matter is handled in accordance with Management Directive 7.4, "Reporting Suspected Wrongdoing and Processing OIG Referrals." (4) A formal process was established in July 1995 for senior power reactor licensee officials to report perceived inappropriate regulatory action directly to the Office of the EDO. Independent of these processes, licensees can informally discuss any concern directly with their counterpart in the regional office or in NRR at any time.

Question 60. (C) What protection has the NRC provided for licensees against any perceived or actual regulatory retaliation they experience? How does the NRC measure whether such protection is effective?

Response. As discussed in the response to the previous question, the NRC has four processes that monitor concerns raised by licensees. Although the NRC does not have a formal metric for measuring program effectiveness, the NRC does not tolerate any regulatory retaliation against its licensees. Any retaliation should be reported promptly to the appropriate Office Director, the Executive Director for Operations, the Inspector General, or the Commission itself so the matter can be promptly addressed by senior agency management. The processes described in Question 60(B) are also available to detect any potential retaliation and to assess whether these mechanisms are effective.

Question 61. The NRC issues administrative letters, information notices, bulletins and generic letters. Each of these communications have significant impact on licensees because they become, de facto, equivalent to regulatory requirements. It would appear that by issuing these communications, the NRC is not following the formal procedures required by the Administrative Procedures Act for imposing regulatory re-

quirements. What oversight does the Commission exercise to ensure that these communications do not impose additional regulatory requirements?

Response. Generic communications issued by the NRC have different purposes. Administrative letters and information notices contain no requirements. Administrative letters inform licensees of administrative procedure changes relating to the implementation of NRC regulations. Information notices (INs) are used to bring significant safety, security, or environmental information to the attention of licensees. INs are not used to convey or imply new requirements. Administrative Letters and INs do not require response from licensees.

Bulletins and generic letters are a type of generic communication based on an existing requirement that transmit information to, requests specified action by, and requires a written response in accordance with Section 182a, Atomic Energy Act of 1954, as amended, and 10 CFR 50.54 (f) from addressees regarding matters of safety, safeguards, or environmental significance. Bulletins generally do not request continuing actions. Generic letters may request that analyses be performed or descriptions of proposed corrective actions be submitted regarding matters of safety, safeguards, or environmental significance. Generic letters may also request addressees to submit technical information to assess present plant conditions. Requests for analyses or technical information may be on a voluntary basis or required in accordance with Section 182a, Atomic Energy Act of 1954, as amended, and 10 CFR 50.54 (f). Generic letters are also used to provide staff technical or policy positions not previously communicated or broadly understood.

Generic letters and bulletins require senior management approval. In an August 7, 1998 memorandum, the director of NRR provided guidance to the staff regarding the need to brief senior management before preparing generic letter or bulletin. The briefing must show the safety benefit achieved compared to the burden imposed on licensees and staff is justified before the generic communication is allowed to proceed through a defined review process. Next, the Committee to Review Generic Requirements (CRGR) conducts a structured review of all proposed generic letters and bulletins in accordance with an established process intended to assure the "value-added" from the particular communication is justified. At this stage, the office of General Counsel reviews the document and if requested it is also forwarded to the Advisory Committee on Reactor Safeguards (ACRS). Industry comments are sought through a publication in the Federal Register. The Commission also reviewed the proposed final document before issuance.

Question 62. During the July 17, 1998, roundtable discussion held by the NRC, former Commissioner Remick stated that the use of "Confirmatory Action Letters has grown by leaps and bounds recently, and these are viewed as convenient techniques to obtain changes that the staff wants done, while getting around the backfit rule, the regulations and the Commission." Commissioner Remick "urge[d]" the Commission to consider the following criteria before issuing confirmatory Action Letters:

- What is the relative safety significance of the individual actions being confirmed? Are the actions, in effect, new requirements?
- Where are the actions specified in the regulations?
- Do the actions meet the criteria of the backfit rule?
- Is the letter truly "confirmatory?"

(A) Does the Commission intend to review recently issued Confirmatory Action Letters against these criteria?

Response. Following the Commission's appearance before the Senate Subcommittee on Clean Air, Wetlands, Private Property, and Nuclear Safety on July 30, 1998, the Chairman issued a tasking memorandum directing the staff to identify, define, and prioritize those areas which support our long term performance goals and which will receive near-term attention. A review of our Confirmatory Action Letter process and criteria has been included in the response to the Chairman's tasking memorandum. As part of this effort, the Commission will integrate the criteria suggested by Commissioner Remick in a review of recently issued Confirmatory Action Letters.

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Question 62. (B) Please provide the results of your review.

Response. The results will be provided following completion of the review. The results of the review are scheduled to be provided in January 1999.

Question 62. (C) What is the current criteria used to determine whether to issue a Confirmatory Action Letter?

Response. The current criteria used to determine whether to issue a Confirmatory Action Letter (CAL) are found in NUREG/BR-0195, Revision 1, "NRC Enforcement Manual." As stated in Chapter 4.6 of the NRC Enforcement Manual:

"CALs are letters issued to licensees or vendors to emphasize and confirm a licensee's or vendor's agreement to take certain actions in response to specific issues. The NRC expects licensees and vendors to adhere to any obligations and commitments addressed in a CAL and will issue appropriate orders to ensure that the obligations and commitments are met. CALs are normally used for emergent situations where the staff believes that it is not necessary or appropriate to develop a legally binding requirement, in light of the agreed-upon commitment. CALs are flexible and valuable tools available to the staff to resolve licensee issues in a timely and efficient manner."

Question 62. (D) Does the Commission intend to change the criteria for issuing future Confirmatory Action Letters?

Response. The Commission will determine the need to change the criteria for issuing CALs following completion of the above review of recently issued CALs. A discussion of this decision will be provided with the results of item (A) in January 1999.

STATEMENT OF NILS J. DIAZ, COMMISSIONER, NUCLEAR REGULATORY COMMISSION

Mr. Chairman, members of the Subcommittee, I appreciate the opportunity to appear before you with Chairman Jackson and my colleague, Commissioner McGaffigan, to add my individual statement, which I request be included as part of the record of the Commission testimony at this hearing. It is my understanding that the hearing will focus on how efficiently NRC is conducting its operations.

The United States Senate has asked for solutions to several issues facing the NRC; budgetary constraints have been proposed, yet requisite health and safety performance must be maintained. The Commission's testimony reflects many new and ongoing initiatives, as well as recent actions of the Commission, that I fully support. There is little doubt that the Commission is acting on many fronts to become more efficient, more focused on risk, and less burdensome. In the coming fiscal year, the Commission, and I hope it is a full Commission, must and will take many steps in this direction.

There is no doubt that much good has been done using a solid core of precepts that center around a deterministic adequate-protection base. Yet, there are areas in which I wish to express my particular perspective on recent and current agency performance and our future course because I believe fundamental changes are needed, can occur and must occur to keep our regulatory processes in step with advancements in technology, safety assessment methodologies, and the new competitive environment.

To embody solutions within resource availability, the NRC has to systematically establish a state-of-the-art regulatory structure that is consistent with the NRC's mission, the policies of the U.S. Government, and the needs of its people: a regulatory fabric that clearly reflects, defines and implements Adequate protection of health and safety" without unbending fear of change and its associated impacts.

The NRC's mission is carried out by a mandate to license and regulate nuclear activities. From my vantage point, the key elements of this mission have been achieved, when final results are used as the performance measuring stick. In the area of achieved nuclear reactor safety, the country has done exceedingly well, especially in the last 10 years. But adequacy of results is only one measure, albeit the key one, of the overall performance of health and safety regulatory agencies in the United States of America. In this context, it is worth recalling that one of the declared purposes of the Atomic Energy Act is "to make the maximum contribution to the general welfare, subject at all times to the paramount objective of making the maximum contribution to the common defense and security;" the NRC, as an instrument of this policy, has the duty to foster attainment of these objectives in a balanced fashion, within our established mandate.

The NRC needs to assure that the uses of nuclear energy and radiation are conducted within the envelope of "adequate protection of health and safety" so the nation benefits from each and every one of the regulated activities. Many present questions and criticisms of this agency's performance stem from the fact that this envelope and its margins of safety have not been well defined, or are rigidly applied, especially when viewed in light of the 1998 state-of-the art. The existing regulatory envelope, old and very conservative with many archaic requirements that flow from it, limits the ability of the agency to optimize its performance. The NRC needs to use today's best available knowledge so as to govern and direct activities in proportion to the health and safety risks they impose, and to do so with only necessary burden. The cost of regulatory burden is paid by the people of this country, and it

is widely accepted that excessive burden undermines general welfare. Regulatory requirements without enhancement of safety need to be eliminated in a timely fashion, and those with little significance have to be placed in the appropriate resource and enforcement focus. Much needs to be done to accelerate the advancement of rules and regulations and their implementation and enforcement using present know-how, with due consideration of risks, and balance between costs and benefits. Therefore, the agency needs to fix:

the compendium of rules and regulations, based on old scientific, technological and legal bases, that do not adequately meet the needs of 1998; and the delivery system that ranges from sound, structured regulation, to a not-so-objective "good guy" or "bad guy" framework, to attempts to control or manage regulated entities.

I would interject that the NRC's activities have been and are well-intentioned, and the majority produce good results. Notwithstanding the intention, the resulting enhancement of safety is sometimes questionable, and the costs are frequently large. In my view, the Commission took important steps to correct its course in the past year when it assumed responsibility for the acceptability of the results of the Senior Management Meeting and the NRC Watch List, and when it decided not to directly assess licensee management performance and licensee corporate culture.

In the context of implementation of our regulations, it is probably good to learn from TMI and Millstone, from 1979 and 1996. The NRC was not prepared for TMI. TMI was a significant safety event. Our lessons-learned provided good safety fixes, but there was also costly overreaction. Indeed, the NRC tried for years afterward to control and manage beyond the level of adequate protection. Maybe that was inevitable because it was a big event, albeit devoid of public health and safety consequences. The NRC was not prepared for Millstone, and it should have been. There was no significant safety event. In fact there were a limited number of issues with safety significance—but there was a pervasive lack of sound corrective actions and failures to address employee concerns. Also, these issues arose against a backdrop of the Commission having not clearly defined what constituted safety. It was the concern, probably correct, that the Millstone units were poorly managed, and that we, the NRC, had not previously done our job to correct the regulatory deficiencies that drove the Millstone actions. I believe the NRC overreacted, specifically in response to design bases issues, because it has not developed a regulatory structure in which requisite performance is proportional to risk.

Risk assessment is very much a part of the nuclear business and the use of risk information is much talked about. Yet, after over 20 years, it is more a promise than a fait accompli. The NRC staff is ambivalent about it, the industry is ambivalent about it, and the Commission has been ambivalent about it. I believe it is no longer sensible to conduct our regulatory responsibilities without risk-informed assessment and decision-making. And if being risk-informed means systematically relinquishing the status quo or the comfortable design basis framework, I propose we do it sooner, rather than later. However, the industry has to buy into it and be convinced of the benefits.

I believe the proposed Senate authorization is sufficient to maintain NRC's functions and to generate change. Profound changes might eventually be costly up-front, but the efficiencies eventually realized will be multiplied in their effects on a safe operating nuclear power industry.

In the context of the above statement, the following key areas of disagreement with the agency testimony were not resolved within the time frame for submittal to the Subcommittee:

1. The testimony states (p. 11, last paragraph, last sentence):

"The present reduction, if carried out, will require the NRC to reduce its planned fiscal year 1999 programs by at least \$17.8 million. As a result, the NRC will cut back on its reactor inspection and reactor oversight programs, curtail selected safety research, eliminate studies of nuclear materials operating experience, and substantially reduce many of its support activities."

I proposed to replace that sentence with the following:

"If these reductions are effected, the NRC shall improve its processes to ensure that no reduction in adequate protection of public health and safety will result."

I believe that the overall message of the paragraph is that we will not have adequate resources, with the contemplated reductions, to modify the agency regulatory approaches along the lines discussed in the testimony, and the planned reduction will seriously and adversely affect important health and safety programs. The case for that message has not been made to me. Indeed, it is my informed view that planned programmatic changes and improved processes can assure adequate protec-

tion within the contemplated reduction, and that this important message needs to be conveyed.

2. The testimony states (p. 6, 2nd full paragraph, 1st line):

“While the NRC believes that the basic focus and emphases of its inspection and enforcement programs are sound, we agree that improvements are needed in both areas.”

I proposed deleting the first clause because nearly everyone, including the Commission itself, seems to be in agreement that highlighted problems and issues warrant further major reviews and fundamental changes in both areas. Therefore, I believe the basic focus and emphases of inspection and, more so, enforcement, are not “sound”; in fact, accelerating changes in these areas support this last proposition.

3. The Appendix includes the following statement (p.A-5, 2nd full paragraph):

“In addition, in reviewing the criticisms that have been directed at the NRC regulatory processes, it is important both for the NRC and for our stakeholders to keep in mind that the basic processes under criticism are the same processes that have resulted in the licensing and operation of 110 safe nuclear power plants. Today, 104 plants are operating to produce 20 percent of our nation’s electricity, with an enviable record in terms of protecting the health and safety of the American people. That should not be taken to imply, by any means, that NRC processes are or should be above criticism—far from it. It does, however, suggest that caution should be exercised in making sweeping changes to ensure that seemingly desirable improvements, made in the interest of increased efficiency or diminished regulatory burdens, do not turn out to have unforeseen adverse effects on the overall objective of ensuring nuclear safety.”

I objected to this paragraph because it appears to imply that robust changes could have adverse effects on nuclear safety. It is difficult to conceive of changes to NRC requirements that would not be rigorously safety-scrutinized; changes need to be made to enhance regulatory efficiency without raising thresholds or decreasing overall requisite safety. Furthermore, the point that the same basic processes were used to license and operate nuclear power plants—for 30, 25 or 20 years—is supportive of the need to change them for responsiveness to present scenarios: many are no longer current or consistent with each other.

4. The Appendix includes the following statement (p. A-20, 2nd paragraph, 5th line):

“A recently identified example was the decline in attention that had occurred, across the industry, on maintaining the facility design basis.”

I proposed deletion of this sentence. I do not believe the case has been made that there was an across-the-industry decline in attention to, or maintenance of, the facility design basis. The completeness and the availability of design basis information are not necessarily equivalent to design safety issues.

5. The Appendix includes the following statement (p. A-36, first partial paragraph, beginning in 7th line):

“These inspections resulted in significant findings, which included, among other things: (1) plant modifications or evaluations that had resulted in operation outside the design basis; (2) modifications or evaluations resulting in safety systems not being able to perform their intended safety functions; and (3) inadequate testing of safety related components. Some of these findings resulted in declaring equipment or systems inoperable, requiring plant modifications and resulting in voluntary or technical-specification-required plant shutdown. These findings were detailed to the nuclear power industry in Information Notice 98-22, issued June 17, 1998. Although licensees expended significant resources to document their design bases, significant safety issues were found and corrected that otherwise might have gone undetected.”

I recommended that this portion of the paragraph be replaced by the following:

“These inspections showed that the rest of the industry, overall, did not have safety problems as a result of design basis issues. While the inspections did identify the need for additional definition, documentation, and compliance, it should be emphasized that safety was not compromised. This result underscores the mismatch that exists between the NRC’s current regulation/regulatory processes and protection of public health and safety. This mismatch can be eliminated through the use of risk-informed, and where appropriate, performance-based inspections.”

My essential point was that the testimony suggests that there were industry-wide, significant safety problems and widespread compromises of overall safety. However, I believe the results of NRC inspections do not support that conclusion and that significant deficiencies were only found in a few plants. The Architect/Engineer (AK)

inspection effort referred to in this passage was terminated because the resource expenditure was not justified by the safety findings. This further supports my conclusion on item 4 above. Our own Inspector General concluded (OIG/97A-01 at 8):

"We believe that while recent regulatory actions and requirements may have enhanced NRC's confidence in Licensees' design control practices, they may not necessarily produce a safety benefit commensurate with their cost to the industry to implement and the agency to enforce."

"While compliance with regulatory requirements is important, in a time of diminishing resources NRC needs to focus on those areas which provide the greater safety benefit. Emphasizing strict adherence to all NRC requirements, some of which may not be safety significant, may result in an ineffective use of resources."

I have tried to provide the Subcommittee with my perspective and understanding on some important areas of the Commission's testimony. I would like to take the opportunity to pledge that I will work for change, not for change's sake, but for safety's sake and for the well-being of the country.

I appreciate the opportunity to present my views and would be pleased to answer any questions that you may have.

STATEMENT OF JOE F. COLVIN, PRESIDENT AND CHIEF EXECUTIVE OFFICER NUCLEAR ENERGY INSTITUTE

Mr. Chairman, Ranking Member Graham and distinguished members of the subcommittee, my name is Joe Colvin. I am president and chief executive officer of the Nuclear Energy Institute. The Institute is responsible for setting policy on matters affecting the nuclear energy industry, including Federal regulatory practices that influence day-to-day operations of nuclear power plants. NEI represents more than 275 companies, including every U.S. utility licensed to operate a commercial nuclear reactor, their suppliers, fuel fabrication facilities, architect and engineering firms, labor unions and law firms, radiopharmaceutical companies, universities and international nuclear organizations.

I would like to thank the committee for considering the nuclear energy industry's views on this matter, particularly in light of the industry's long-standing recommendation for comprehensive reform of Nuclear Regulatory Commission's regulatory regime. As the industry's policy leader, NEI is committed to ensuring the continued, safe operation of more than 100 nuclear power plants amid a changing marketplace. Today, the focus is on nuclear power plant regulations, but concerns about reform are issues that apply to all licensees.

My testimony will provide a historical account of NRC's attempts at reform, but more importantly reiterate the need for a new regulatory process that continues to protect public health and safety, but is more efficient, less intrusive and less costly. The shift to a new regulatory framework should recognize the appropriate balance of risk insights and safety, and lessons learned from four decades of consistently improved performance.

The safety, reliability and economic performance of U.S. nuclear power stations have improved dramatically during the past two decades, yet the NRC's regulatory programs and oversight have failed to recognize these changes. Assessment, inspection and enforcement policies are inconsistent with the industry's high level of performance. The NRC's comprehensive regulatory approach remains focused on an old paradigm—the assumption that licensees will not maintain compliance or make required safety improvements unless enforcement actions are taken routinely in response to noncompliance. Recent operating and safety statistics prove otherwise. By any set of standards, including the NRC's Office for Analysis and Evaluation of Operational Data, the industry's safety record supports a fundamental change in the NRC regulatory process. The agency, however, operates under an outdated regulatory process that is mired by conflicting regulatory interpretations that often circumvent the formal rulemaking process. NRC enforcement action focuses on strict compliance, and its inherently subjective concept of "regulatory significance" is misplaced and has the potential to adversely affect safety. The commission also suffers from chronic delays in issuing licenses and responding to other industry petitions.

The NRC must undergo comprehensive regulatory reform that includes safety-focused regulations, consistent guidelines for meeting these regulations, efficient inspections to verify compliance, and a balanced enforcement program to respond to noncompliance. In doing so, the agency should adopt the best practices and efficient processes identified and in use at other Federal agencies that have undergone similar reform. The NRC has already begun this effort in some aspects of its regulatory scheme, and the industry commends the commission's work, under the leadership

of Chairman Shirley Ann Jackson, on many fronts, such as license renewal rule. There also are signs that the NRC is considering revamping its highly subjective plant assessment process to one based on objective criteria.

Introduction

Nuclear energy is America's leading source of emission-free electricity, supplying nearly 20 percent of our power at a competitive price. The industry has more than 40 years of operating experience in the United States and is the global leader in nuclear safety. Since the early 1970's, nuclear power has strengthened the diversity and security of our energy supply, powered economic development and helped raise our quality of life. More than 435 nuclear power plants produce 17 percent of the world's electricity. Nuclear energy's clean air benefits also are a significant factor in many developed countries' plans to meet emissions reductions outlined in the Kyoto Protocol.

The nuclear energy industry consistently has supported the NRC's mission as a strong and credible regulator. Safety is and always will be the industry's first priority, and a strong, credible regulator is essential to instill public trust and confidence in our industry. But effective and efficient regulation that protects public health and safety should be accomplished through a regulatory approach that focuses on safety and allows industry and the NRC to allocate resources to those areas most important to safety.

As the United States makes the transition to a competitive market for electricity production and distribution, our most significant business uncertainty is not the cost of fuel, such as natural gas, or changing environmental requirements on emissions that may increase the cost of, or limit production from, fossil fuel sources. The most significant area of uncertainty is the NRC's inconsistent, outdated regulatory process, its drain on the agency budget and utility resources, and its failure to focus directly on regulations that are most important to protecting public health and safety.

As states confront the dual challenges of industry competition and stringent emissions reductions requirements, energy officials increasingly are recognizing the "hidden value" of the continued operation of emission-free energy sources. Nuclear energy's transition to a competitive market will depend, in part, on the NRC's ability to adapt to the same changing environment and how swiftly the agency responds to nuclear power plant license transfers and other licensee petitions to the agency.

History, however, demonstrates that the agency is slow to change. At its best, the agency has shown a willingness only to embrace short-term, piecemeal reform. At its worst, the agency has not responded to numerous, independent recommendations for integrated, systemic change. The NRC also has undertaken a number of self-assessments and industry reviews, but none have resulted in significant change in NRC process or culture.

Congress has the opportunity to provide the necessary impetus for change through ongoing oversight and guidance that would sustain fundamental reform of the NRC's regulatory process. Just as the industry has made a significant transition in the way it operates in a competitive market, the NRC must replace an outdated regulatory framework with one that is safety-focused and responsive. As part of this need for fundamental change, Congress should ensure that the agency is successfully on the path of implementing meaningful reforms. NRC's past reluctance to initiate a self-directed reform program demonstrates this need for continued congressional oversight. Given the onset of electricity competition, reform of the regulatory process must be accomplished without delay.

Regardless of the transition to a competitive electricity market, the NRC-like all Federal agencies-is obligated to provide the least intrusive, most efficient and most cost-effective regulation commensurate with protecting public health and safety. The NRC has an obligation to electricity consumers and the industry to follow the lead of other Federal agencies in undertaking reform that reflects today's business environment.

For example, the Federal Energy Regulatory Commission (FERC) announced on June 10 that it recently completed a 4-month study about how to streamline the agency's procedures to keep pace with rapid industry changes. The agency intends to enhance the timeliness of its decisions and focus more resources on market issues. FERC Chairman James Hoecker describes the reform effort as "our way of acting strategically to make regulation efficient and beneficial where it is required and less intrusive or even unnecessary where it is not ...The commission must embrace the culture of customer service and advanced technology into which regulated com-

panies are swiftly being drawn.¹ FERC intends to implement operating changes in phases during the next 2 years.

Congressional Recognition of Need for Regulatory Reform

The industry applauds this committee's oversight, including today's hearing to examine a sensible, meaningful approach toward reform of the NRC's regulatory process. We encourage your ongoing direction of the commission's regulatory reform activities. Similarly, Senate appropriators have undertaken a broad examination of the regulatory process as part of the Federal budget review. The Senate Appropriations Committee in June sent a strong message to the NRC about persistent weaknesses in its implementation and enforcement of regulatory requirements.

The committee noted that six major reviews of the agency since 1979 have revealed common criticisms, including: "the NRC's approach to regulation is punitive rather than performance based, licensees are forced to expend considerable resources on regulations that are not related to safety, the NRC is unnecessarily prescriptive, licensees fear retribution for criticism, there are not specific criteria for important NRC actions such as placing a reactor on the watch list, and the NRC focus on paper compliance is not related to and can distract from safety activities."

The committee added that it "is concerned that the NRC has done little to respond to these reviews and believes that a major review should be undertaken to improve the efficiency of the NRC and the manner in which it oversees public health and safety." As part of this review, NRC was directed to issue monthly reports on the progress of its licensing and regulatory duties.

More telling, perhaps, of the committee's dissatisfaction is its recommendation to limit extension of the agency's user fee to 1-year increments, rather than the NRC-requested 5-year authorization. The NRC's authority to assess licensees for 100 percent of budgetary expenses expires in fiscal year 1998. The industry supports the 1-year reauthorization to provide an opportunity for continuing oversight until Congress is satisfied with improvements in the regulatory system.

The nuclear energy industry applauds the Senate appropriators' vigilance and also urges this committee to support the 1-year reauthorization of NRC's user fee collections until the agency successfully implements regulatory reform. Congress also should require the NRC to measure its success at implementing overall regulatory reforms and regularly report its progress to this committee.

NRC Reform: A History of False Starts

An unacceptable lag time has developed between the understanding that regulatory reform must take place at the NRC and a serious attempt to accomplish it. Nearly 20 years have past since the first NRC review recommended the need for a shift in the agency's regulatory process.

In 1979, the President's Commission on the Accident at Three Mile Island provided one of the first accounts of the need for regulatory improvement. The so-called Kemeny commission was appointed by President Carter to review the accident at the Three Mile Island nuclear power plant.² One of its conclusions—that "NRC tends to focus industry attention narrowly on the meeting of regulations rather than on a systemic concern for safety" remain relevant today.

The Kemeny Commission also noted "a preoccupation [by NRC] with regulations . . . We are convinced that regulations alone cannot assure safety. Indeed, once regulations become as voluminous and complex as those regulations now in place, they can serve as a negative factor in nuclear safety."

At least five other independent reviews of the NRC's regulatory practices echo the Kemeny report's conclusions. The agency's own internal examinations also have found fault with NRC practices. For example, a 1981 Regulatory Impact Survey by senior NRC management reviewing the safety impact of regulatory activities determined that, "notwithstanding the competence and good intentions of the [NRC] staff . . . the [slow] pace and nature of regulatory actions have created a potential safety problem of unknown dimensions."³

A chronology of recommendations to reform the regulatory process and false starts on the part of NRC at reform are attached to this testimony (Attachment A). These recommendations include:

¹ Federal Regulatory Commission news release, "Commission Plans Major Changes to Keep Pace with Regulated Industries," June 11, 1998.

² Report of the President's Commission on the Accident at Three Mile Island, October 1979.

³ NUREG-0839, 1981: "A Survey by Senior NRC Management to Obtain Viewpoints on the Safety Impact of Regulatory Activities from Representative Utilities Operating and Constructing Nuclear Power Plants."

- An Oct. 15, 1986 letter from the chairman of the Advisory Committee on Reactor Safeguards to the NRC chairman. The ACRS chairman said that NRC staff “has a tendency to regulate in an economically wasteful fashion.”
- A Nov. 24, 1989 letter from the chairman of the Advisory Committee on Reactor Safeguards to the NRC chairman addressed coherence in the regulatory process. The letter described a “problem of the regional administrators, who sometimes have practices that differ from each other, and from headquarters. In the end, it is the regional administrators with whom a licensee has the most contact, and who embody NRC in the field, and there are too many cases in which their dicta go well beyond the policies set by the commission [NRC].”
- A 1989–90 Regulatory Impact Survey found that “licensees acquiesce to NRC requests to avoid poor numerical Systematic Assessment of Licensee Performance ratings and the consequent financial and public perception problems that result, even if the requests require the expenditure of significant licensee resources on matters of marginal safety significance.”
- A 1992 National Academy of Sciences study concluded that “an obstacle to continued nuclear power development has been the uncertainties in the Nuclear Regulatory Commission’s licensing process.”
- A 1994 industry study conducted by Towers Perrin found that NRC’s regulatory practices did not increase the safety margin at nuclear power plants. Nuclear licensees also reported an increase in “pressure to take actions not required by regulation.”⁴

A chart attached to this testimony (Attachment B) further demonstrates that NRC’s regulatory weaknesses have been repeatedly identified for reform through independent reviews.

Regulatory Process In Need of Systemic Improvement

NRC’s regulatory programs and enforcement policy are inconsistent with the industry’s high level of operating performance. As a result, agency and industry resources are consumed by matters that have low safety significance, including a dramatic rise in enforcement actions where there is no tie to safety.

The industry applauds the commission’s work on many fronts, such as the license renewal rule, and there are signs that the NRC is considering revamping its highly subjective plant assessment process to one based on objective criteria. Nonetheless, immediate, fundamental changes in policy and culture are necessary to ensure that a tightly focused regulatory system is established and effectively implemented.

At every turn, NRC’s regulatory procedures are overly prescriptive—a process rooted in the 1950’s, when knowledge about nuclear safety and nuclear plant operating experience was evolving. In 1979, regulations for operating nuclear power plants were complex and prescriptive. Rather than heeding the Kemeny Commission’s recommendations, the regulations and regulatory requirements have become even more complex today.

The complexity of regulatory requirements stems in part from the different vehicles NRC uses to issue guidance. However, NRC’s informal, subjective guidance imposes obligations on licensees without undergoing the notice and comment procedures established by the Administrative Procedures Act. These practices include:

- Issuing informal guidance through generic NRC communications that utilities feel obligated to follow, and confirmatory action letters that provide specific recommendations to plant operators concerning corrective action. These letters and guidance ultimately become regulatory obligations.
- Examples of NRC’s subjective practices include determining which plants should be placed on the watch list and rating plants through the systematic assessment of licensee performance.

These practices often are confounded by conflicting interpretations from NRC’s regional offices. At an NRC roundtable discussion earlier this month, Dr. Zack Pate, chairman of the World Association of Nuclear Operators, said “Headquarters and regional personnel routinely, every day, indeed every hour, impose requirements on the plants that the Commission or the EDO or other senior managers would not support if in each instance you knew what was happening. Time and time again over these past 18 years that I have been observing, when such examples are brought to the attention of an individual commissioner or the EDO, you [NRC management] find the situation to be just as unreasonable as I do, but this continues. The Towers-Perrin study, conducted some 4 years ago, illustrates this problem quite clearly, even dramatically.”

⁴Nuclear Regulatory Review Study, “Final Report,” p. 3.

The NRC's regulatory inconsistencies also contradict the Clinton Administration's regulatory reform initiative. Executive Order 12866, issued in 1993, envisions a Federal regulatory system that "protects and improves health, safety, environment and well-being without imposing unacceptable or unreasonable costs on society."

Far More Burden, No More Benefit

NRC's emphasis on strict adherence to requirements that lack safety significance has created a regulatory environment that suffers from a lack of prioritization. Licensees are penalized based on regulation to a zero-defect threshold at a time when industry safety reliability and economic performance are at an all-time high.⁵ Regulating to a zero-defect threshold results in a broad spectrum of requirements that presumably are equally important, and ultimately, detract from the important safety mission.

The regulatory disconnect also is recognized by Wall Street. A June report from Moody's Investor Service takes note of the NRC's heavy regulatory burden and its bearing on the industry's future. "Despite safety performance records that are at an all-time high, continued close scrutiny by the Nuclear Regulatory Commission also represents a challenge for all nuclear utilities."⁶

Another industry concern stemming from NRC's varying guidance mechanisms is that regulation should be consistent with NRC's backfit rule, which requires that new interpretations of existing regulations or newly issued regulations must be reviewed under 10 CFR 50.109 to determine if they are necessary to preserve adequate protection or to bring a plant into regulatory compliance. If neither of those conditions are met, then NRC regulations require backfits to undergo a cost-benefit analysis demonstrating that such an action will result in a substantial increase in public safety and be cost beneficial.

The methods used to determine the cost-benefit analysis by the NRC can, and have, justified nearly any new regulation imposed by the agency. For example, the NRC takes "averted on-site costs" into consideration in the cost-benefit calculation of a new regulation. This, in effect, is an assumption of the economic loss to a licensee due to a plant shutdown-the cost of replacement power, labor, etc., that could be incurred if such a regulation was not in place. This "benefit" is then used to justify the imposition of a new regulation that could not be justified otherwise. This results in the licensee committing budget and resources to implement a regulation not needed for safety.

Equally troubling to NRC licensees is the lack of relative priority given to non-safety related compliance issues by the agency staff both at headquarters and in the regions. There is widespread agreement by the industry and the commission that nuclear safety would be enhanced by a more objective prioritization of available resources based on the objective safety significance. There is a high level of safety in the industry today. And while the industry certainly can accomplish the most important safety goals, it should not be required to devote the same level of resources to non-safety significant requirements.

The agency's inconsistent approach to the regulatory process and shifting interpretation of some regulations makes it difficult for utilities to consistently prioritize activities subject to NRC regulation. Adopting a performance-based regulatory framework would permit utilities to focus resources on areas that are most important to the continued protection of public health and safety.

No Margin For Error

The industry recognizes that the NRC has conducted a number of reviews of the enforcement policy during the past 4 years,⁷ with the intent of improving its effectiveness and implementation. While some productive changes have resulted from NRC's redesign, the agency continues to isolate its review of the enforcement process from overall reform. Yet in order for NRC's enforcement procedures to be truly effective, they must be part of an integrated, comprehensive regulatory framework. That framework must include safety-focused regulations, consistent guidelines for meeting these regulations, efficient inspections to verify safety-based compliance and a balanced enforcement program to respond to noncompliance when it affects safety.

⁵ For example, in 1997, the median value for unplanned automatic shutdowns at nuclear power plants was 0 per 7,000 critical hours, down from 7.3 in 1980, according to the 1997 World Association of Nuclear Operators Performance Indicators.

⁶ Moody's Investor Service, Special Comment, "Restructuring Reduces Fallout from Deregulation for Nuclear Utilities," June 1998.

⁷ The latest revisions to the enforcement policy, NUREG-1600, "General Statement of Policy and Procedure for NRC Enforcement Actions," were published May 13 in the Federal Register.

Despite the industry's long-standing recommendation to reform the enforcement process, NRC remains wedded to the view that unless enforcement action is taken, licensees will not take steps to maintain safety. This approach is not only outdated based on industry performance, but it also is rooted in the agency's assessment process, which focuses in part on the number and types of violations NRC or licensees report.

In the past 2 years, the industry has witnessed a sharp spike in the total number of violations, despite improvements in industry safety trends. For example, NRC imposed 50 percent more industry violations (1,519) in 1997 than a year earlier. This increase belies the performance of the industry and underscores the disconnect between the inspection process and the NRC's goal of assuring adequate safety in the sense that the industry spends significant time on areas of compliance that have a relatively low impact on safety. This process of responding to low-level violations must be revamped so that the industry and NRC can maintain their focus on safety significant issues.

The Union of Concerned Scientists (UCS) told the commission recently that the largest problem with inspection enforcement and assessment is tied to "how the NRC classifies the plant's performance, or how it predetermines the plant performance. If a plant is in good standing, then it gets good inspections. It gets good enforcement action, and it gets good performance assessment. If the NRC places that plant into the regulatory distress category, then all these things drop off the board, and there's a step change virtually overnight into the other category." UCS safety engineer David Lochbaum told the commission that "the plant's status did not change overnight, just the NRC's perception of that plant. What in the past apparently was written up as a non-cited violation is now being cited as a violation. The standard shouldn't change. If there were problems before, they should have been reported as problems before. If they're not problems today, they shouldn't be reported as problems today. There's something wrong with that kind of performance."

Response to Violations with Low Safety Significance

Of the 1,519 violations in 1997, 1,417, or more than 90 percent, fell into the category of least safety significance-severity level IV. Often, these violations have little relevance to a plant's overall performance. The following examples illustrate these flaws:

- In May 1997, NRC inspectors noticed three-ring binders resting above a main control room panel at a nuclear plant and issued a level IV violation.⁸ According to the NRC, the binders could have posed a potential safety problem if they became dislodged during an earthquake.
- Another utility was cited because a diesel generator proved to be more robust than regulatory guidelines required.⁹
- NRC issued a level IV citation to a nuclear plant for failing to mark a procedure in an operations manual with a double asterisk.¹⁰

Despite their relatively low safety significance, severity level IV violations nonetheless demand a timely response. A timely response, however, demands resources. And a plant operator has no choice but to divert these resources away from matters that may be of greater safety concern. In effect, the NRC is managing a plant's priorities when it issues severity level IV violations with a train of paperwork and corrective action.

The industry believes other flaws exist within NRC's enforcement procedure, such as the aggregation of violations.

Combining and Elevating Violations

The NRC often aggregates violations that it believes arise out of the same circumstances or that share common root causes and combines them to impose a violation of a higher severity level. For example, several relatively minor violations can become a severity level III candidate.

⁸NRC Inspection No. 97-06, May 16, 1997. Instead of instructing the plant operator simply to move the binders, the inspector cited the plant. The utility had failed to conduct a written evaluation to ensure that the binders did not involve an "unreviewed safety question."

⁹NRC Inspection No. 97-11, August 8, 1997. In performing its standard loading test of an emergency diesel generator, a utility operated the generator at a capacity greater than 4,700 kilowatts, even though guidelines specify the generator should be operated at less than 4,700 kilowatts, but greater than 4,450 kilowatts during an allotted period.

¹⁰Years before, the plant had committed to NRC to mark the procedure with a double asterisk as a reminder to operators that they must read the procedure step by step when they perform it. When the operations manual was revised, an administrative assistant inadvertently left off the double asterisk. The plant was fined for not meeting a regulatory commitment.

In 1997, the NRC significantly increased its practice of aggregating minor violations, thereby elevating or "escalating" the level of violations, industry data demonstrates. The number of aggregated violations cited in an escalated action was almost three times that of 1990. Many licensees believe that aggregation is used to unduly inflate the perceived significance of problems that are of themselves not safety-related.

A November 1997 aggregated violation illustrates this point.¹¹ NRC cited a nuclear power plant where a control switch on a backup emergency diesel generator was improperly positioned. The utility received six separate procedural violations relating to the failure to correct the switch position error and record it in an operating log. Collectively, the violations became a severity level III violation.

In another case, during a period between July 1994 and July 1995, a utility's salt service water system recorded temperatures that exceeded the design bases. The NRC did not identify those temperature changes until 1997, when the agency issued seven violations to the utility. At no time prior to the citation's issuance had NRC notified the plant that the agency determined its temperature variations were in excess of plant requirements. The violations were combined and escalated to a severity level III violation, which includes a \$55,000 fine.

The NRC's use of aggregation is problematic because of its inherent subjectivity and the discretion it inserts into the enforcement process. Are minor problems linked? Should they be aggregated? Do they reflect a broad performance problem? These are questions that have less to do with the actual violations and their consequences, and more to do with individual perceptions of licensee programs, processes and performance.

Licensing Reviews and Staff Changes Mired in Bureaucracy

NRC requires agency approval prior to a wide range of industry activities. Many, such as licensing applications and corporate license transfers, are accepted as priorities for review. Other requests, such as those seeking code relief for plant repairs, rank low in NRC consideration.

However, industry experience proves that a priority in the queue doesn't necessarily translate into timely review. Despite NRC pledges of expedience, many industry requests are subject to unreasonable delays. Such inaction can prevent private companies from safely meeting the needs of the marketplace—often at considerable expense. As a result of delay in the NRC licensing process, Louisiana Enrichment Services, L.L.P. withdrew its application after spending \$34 million and more than 7 years participating in the licensing process.

The Louisiana company in April withdrew its NRC application for a license to construct and operate the Claiborne Enrichment Center. "The inability of the licensing process to operate in a predictable, efficient and timely manner" was the driving factor in abandoning the fuel enrichment project, LES President Roland Jensen told the NRC. LES had filed its application with the NRC on Jan. 31, 1991, with the expectation of operating the nation's first privately owned nuclear fuel enrichment facility by 1996.

The NRC failed to resolve LES's licensing issues in a timely manner despite the fact that Congress, as part of the Energy Policy Act of 1992, amended the Atomic Energy Act expressly for that purpose—to mandate a streamlined, one-stage licensing process for uranium enrichment facilities.

Evidence of NRC inaction abounds in other areas.

Portland General Electric Co. is awaiting an NRC decision on its application to ship a reactor vessel with internal components intact to a low-level radioactive waste disposal facility in Hanford, WA.¹² The company submitted its application in the summer of 1996 in hopes of meeting a summer 1998 shipment date. After significant delays on NRC's part, PGE has been forced to delay its shipment until 1999.

Portland General Electric proposed the shipment to significantly limit worker exposure to radioactive elements within the reactor vessel that otherwise would be dismantled for shipping. In addition, PGE's proposed method—a practice the Navy routinely uses in shipments¹³—would save \$14 million in decommissioning costs.

Today, PGE still awaits NRC action.

In the past, the NRC also has been slow to authorize nuclear plant license transfers. An NRC decision on Georgia Power Co.'s request to transfer its Vogtle power

¹¹ NRC Inspection No. 97-10, Nov. 7, 1997.

¹² Portland General Electric Co. submitted an application for exemption from Part 71 to ship the Trojan reactor vessel with internals intact to the Hanford low-level waste disposal site.

¹³ The Navy conducts approximately nine shipments of reactor vessels a year to the Hanford disposal facility.

station license to the Southern Nuclear Operating Co. as part of a corporate reorganization took more than 4 years.¹⁴

Both companies are subsidiaries of the Southern Company. The transfer did not entail a change in Vogtle's staff or management structure.

The Vogtle experience serves as fresh evidence that the NRC's licensing procedures are in need of revision to respond to today's high level of plant operating performance and the emerging business climate. The NRC must instill proper focus and discipline to its licensing procedures for commercial nuclear facilities. In a competitive market, electric companies' success will be measured in part by the speed with which they can respond to business decisions. NRC's license transfer process must strike a balance between the need to ensure corporate resources are adequate to safely operate a nuclear power plant and the new business paradigm in the electricity market.

As retail competition emerges, more electricity generation facilities of all types will be bought and sold, thereby requiring a timely license review to keep pace with industry changes. For example, GPU Nuclear, Inc. announced earlier this month that it has reached agreement in principle to sell Three Mile Island (TMI) Unit 1 to AmerGen Energy Co., jointly owned by PECO Energy Co. and British Energy. The sale—the first of an operating nuclear plant in the United States—will require regulatory approval and license transfer. Several agencies, including the NRC, will review the sale during the next 12 to 24 months.

Similar transactions of electric generating facilities are expected to follow as the retail market continues to evolve.

Creating Regulatory Burdens At Safety's Expense

Safety is the nuclear energy industry's top priority, and we recognize the statutory responsibility that the NRC has to assure adequate protection of public health and safety. However, the industry is concerned that the NRC has created a regulatory environment in which the agency's overly conservative, compliance-oriented approach compromises attention to safety.

In a 1997 audit, the NRC's Office of Inspector General recognized a conflict between the commission's goal of focusing on issues of greatest safety significance and actual resources devoted to verifying license compliance with regulations of limited safety benefit.¹⁵ The report, which focused on NRC events surrounding refueling practices at Northeast Utilities' Millstone Unit 1 that were outside of the plant's design bases, concluded that the commission should adopt a risk-informed, performance-based regulatory system—that is, a system that measures an acceptable level of risk and weighs plant performance or outcomes accordingly.

Concerns at Millstone prompted the NRC in October 1996 to seek assurances that all nuclear power plants were operated and maintained in accordance with their design bases. Licensees were given 3 months to respond.

NRC's request carried the weight of a formal rule and utilities worked diligently to respond to the detailed request for information ranging from engineering design and configuration control processes to a plant's procedure for identifying problems and implementing corrective actions.¹⁶

While the agency estimated the letter would require a licensee's staff to spend 400 hours to respond to the letter, licensees devoted an average of 2,000 staff hours per plant, according to industry estimates. As one utility told the NRC, "We have expended considerable efforts to collect, compile and evaluate data." One licensee assigned a 30-member team that spent 15,000 man hours responding to risk significant systems reviews—only one of the five areas in which NRC requested information.¹⁷ Another utility reviewed 105 separate plant systems to assure conformance with the design bases.¹⁸

In addition to the time devoted to respond to the letter, some utilities said their efforts to verify conformance with design bases requests and reconcile deviations cost millions of dollars.

¹⁴ An intervenor used the license transfer proceeding to address a complaint about management at the electric company. The licensing authority allowed this to sidetrack the transfer process and destroy the discipline of the process.

¹⁵ OIG/97A-01, NRC Needs Comprehensive Plan to Resolve Regulatory Issues, Aug. 21, 1997.

¹⁶ Oct. 9, 1996 NRC letter: "Request for Information Pursuant to 10 CFR 50.54(f) Regarding Adequacy and Availability of Design Bases Information."

¹⁷ Feb. 12, 1997, North Atlantic Energy Service Corp. response to NRC request for Seabrook Station's reply to 10 CFR 50.54(f) letter.

¹⁸ Feb. 8, 1997, Florida Power Corp. response to 10 CFR 50.54(f) letter for Crystal River Unit 3.

Indeed, the NRC Inspector General's audit said, "NRC needs to recognize the cost to verify compliance with regulatory requirements may not produce commensurate safety benefits."

More importantly, however, the exercise revealed virtually no safety significant findings while diverting valuable plant resources from increasing plant safety.

A survey by the NRC's Office of Analysis and Evaluation of Operational Data (AEOD) further supports this point. AEOD reviewed 1997 design bases events covered under 10 CFR 50.72 and 10 CFR 50.73. Of the 296 events recorded, only two events could have had an impact on-and an extremely low probability of affecting public health and safety. What's more, 28 percent of the events cited occurred at the Millstone, Point Beach and Crystal River plants, which were shut down at the time.

This type of regulation continues to focus on compliance and prescriptive procedures about how outcomes should be achieved at plants, rather than the actual outcomes. The industry strongly supports the NRC's attempts to move toward risk-informed, performance-based regulation that would focus on plant results and sharpen the safety focus. To that end, the agency must expedite its transition to this new regulatory system.

Conclusion

Recent events concerning NRC enforcement, compliance, reporting and licensing procedures have demonstrated persistent weaknesses in the agency's regulatory system. The NRC's regulatory procedures clearly are broken and are in desperate need of a fix.

In order to regulate more effectively, the NRC must undergo fundamental reform so that agency activities are more attuned to the experience and improvement gained from 40 years of nuclear energy operation and the rapid changes affecting the industry it regulates. NRC Commissioner Edward McGaffigan accurately portrayed the need to revamp the regulatory process during a 1997 meeting of all NRC employees. "The old model of a ponderous industry dealing with ponderous state utility commissions and a ponderous regulator [is] not going to be viable for very much longer," Commissioner McGaffigan said.

Just as the industry has made a significant transition in the way it operates in a competitive market, the NRC must replace an outdated, ineffective regulatory framework with one that is objective, safety-focused and responsive. The agency can achieve these goals by adopting risk-informed and performance-based concepts in its regulatory.

Under risk-informed regulation, the NRC would use nuclear power plants' operating experience and analytical tools, such as the probabilistic safety assessment (PSA), to match design and operational issues with their relative importance to public health and safety. The NRC currently employs a prescriptive and deterministic regulatory approach that does not rely on plant operating experience or PSAs.

NRC's new regulatory culture also should embrace a performance-based approach—that is, regulation that focuses on results as the primary means for oversight—not procedures. Performance-based regulation demonstrates the following attributes:

- Measures of plant and license performance;
- Objective criteria to assess performance, such as performance history; and
- Flexibility for licensees to determine how they can best meet the performance criteria.

While the NRC must immediately undertake fundamental change, Congress should take the following steps:

- Authorize the agency's budget in 1-year increments until the committee is satisfied that the agency is successfully implementing meaningful reforms. Long-standing issues and problems have been identified in six major reviews since 1979, but the commission has not responded to these reviews. The NRC's program should include benchmarks to measure the progress that the agency is making the transition to a more effective agency.
- Congress should require that the NRC report its progress at regular intervals, and Congress should hold regular oversight hearings to ensure reform is undertaken expeditiously.
- Congress should require an independent study of the effectiveness of NRC programs, as well as management and staff.

The industry is committed to working with the commission in a partnership that is built on trust, cooperation and the common goal of protecting public health and safety. In recent months, the commission has demonstrated a good-faith effort to move forward with critical reform. The industry is encouraged by these actions and

offered the NRC eight areas of regulatory improvement. A similar version of the suggested improvements is attached to this testimony (Attachment C).

Nuclear power is one of our most important energy sources, and will be even more vital as we strive to meet future energy and environmental goals that are inextricably linked. In the same context, the NRC-like most other Federal agencies-must undergo fundamental change in the way it regulates our industry so that it is focused on those regulations that are important to safety and responsive to emerging issues. This reform is vital for the nuclear industry will continue to provide broad benefits to society, including electricity for 65 million American households that rely on these facilities to produce their electricity.

ATTACHMENT A

CHRONOLOGY

A. *The President's Commission on the Accident at Three Mile Island (The Kemeny Report), October 1979*

KEY EXCERPTS

1. "The existence of a vast body of regulations by NRC tends to focus industry attention narrowly on the meeting of regulations rather than on a systematic concern safety. Furthermore, the nature of some of the regulations, in combination with the way rate bases are established for utilities, may in some instances have served as a deterrent for utilities or their suppliers to take the initiative in proposing measures for improved safety."

2. "We note a preoccupation with regulations. It is, of course, the responsibility of the Nuclear Regulatory Commission to issue regulations to assure the safety of nuclear power plants. However, we are convinced that regulations alone cannot assure safety. Indeed, once regulations become as voluminous and complex as those regulations now in place, they can serve as a negative factor in nuclear safety. The regulations are so complex that immense efforts are required by the utility, by its suppliers, and by the NRC to assure that regulations are complied with."

B. *NUREG-0585, "TMI-2 Lessons Learned Task Force Final Report," October 1979*

KEY EXCERPTS

3. "This opportunity has led us to a critical scrutiny of NRC safety policy. What we have found is that prescriptive and narrow licensing requirements only add to the quilt work of regulatory practice and do little to directly address the nation's heightened concern for the safety of nuclear power plants."

4. "The Commission should undertake with the staff the development and articulation of clear criteria to define the basic safety goal for nuclear power plant regulation. Since this goal will be used as a benchmark by the staff in defining new regulatory requirements, definitive policy guidance should also be developed regarding the threshold for backfitting of new requirements to existing plants. The Task Force believes that the goal should be supplemented where possible with qualitative reliability or risk criteria, with limitations being placed on their use to assure that such criteria do not impede the capability for timely decisionmaking."

C. *"Three Mile Island—Report to the Commissioners and to the Public" (Rogovin Report) January 1980*

KEY EXCERPTS

5. "We have found in the Nuclear Regulatory Commission an organization that is not so much badly managed as it is not managed at all. . . Obviously, one of the Commission's functions is to manage and set policy for its staff. But in practice, the Commission has isolated itself from the NRC staff. The Commission does not directly supervise the staff's day-to-day work."

6. "More surprising than that the Commission spends very little time managing or setting goals for the NRC staff is the fact that until recently it has spent very little time as a Commission deliberating or deciding any of the broad or important issues relating to reactor safety. . . Instead it appears that the Commission has traditionally spent the bulk of its meeting time on dozens of specific, isolated safety-related matter, on personnel and budgetary matter, administrative chores, and such issues as export licensing."

D. Regulatory Impact Survey of 1981, NUREG-839 ("A Survey by Senior NRC Management to Obtain Viewpoints on the Safety Impact of Regulatory Activities from Representative Utilities Operating and Constructing Nuclear Power Plants")

EXECUTIVE SUMMARY OF COMMENTS

7. "A major issue identified is the imposition of requirements. Licensees consider the NRC system of imposing requirements to be "out of control" (generic letters, bulletins, circulars, notices, orders, rule changes, NUREGs, Regulatory Guides)."

8 "The licensees consistently commented that they no longer manage their own resources or set their own priorities. They assert that NRC functionally dictates their plans and schedules by virtue of work activities necessary to satisfy NRC-imposed requirements on NRC-required schedules. It was the licensees' view that NRC does not live in the real world of planning and scheduling."

SURVEY FINDING

9. "It is the finding, notwithstanding the competence and good intentions of the (NRC) staff, that the pace and nature of regulatory actions have created a potential safety problem of unknown dimensions."

E. Report of the Regulatory Reform Task Force on Nuclear Licensing Reform (DRAFT), November 1982 (A report prepared by the Regulatory Reform Task Force, a group comprised of senior NRC personnel to review the reactor licensing process at the request of NRC Chairman Palladino)

KEY EXCERPTS

10. "The suggestion has been made that undisciplined backfitting may have made nuclear plants more difficult to operate and maintain and, hence, may have had an adverse effect on the public health and safety. It has been variously suggested that backfitting leads to less than optimal design arrangements; that it compels personnel to constantly face the uncertainties associated with change and perpetual retraining; that it sometimes requires a high level of construction, creating distraction and, therefore, a negative effect on operation. . . "

F. "Report of the Edison Electric Institute on Nuclear Power", February 1985 (An Industry Task Force comprised of the Chief Executive Officers of seven utilities, Messrs T. Justice Moore, Jr. (Chairman), Virginia Electric and Power Company; Edward L. Addison, The Southern Company; Howard P. Allen, Southern California Edison Company; William B. Ellis, Northeast Utilities; William S. Lee, Duke Power Company; Donald W. McCarthy, Northern States Power Company; Marshall McDonald, Florida Power & Light Company; John J. Keamey, Edison Electric Institute; developed this report for the industry. Its results were communicated to the NRC).

FINDINGS & RECOMMENDATIONS

11. "[u]nder present regulatory and institutional arrangements, no American electric utility would consider ordering a new nuclear power plant. The costs and risks of nuclear development in the United States have become unacceptably high."

12. One specific recommendation was the "[e]xamination of the management structure of the NRC with the objective of improving the organization's effectiveness and efficiency."

G. "A Report on the Management Structure of the Nuclear Regulatory Commission," June 1986 (Prepared for Edison Electric Institute)

13. ". . . new commitments for nuclear energy plants essentially stopped about the time the Commission was formed. Every civilian nuclear energy plant ordered after the Commission was established has either been canceled or placed on indefinite deferral. While many factors contributed to this drop-off in commitments to nuclear energy, the organizational structure of the Commission is viewed as one contributor to the unpredictability and lack of stability in the Federal safety licensing process. Without predictability and stability, the nation's utilities are unable and unwilling to call on new nuclear energy plants to fill the energy needs of a growing economy."

H. "Leadership in Achieving Operational Excellence", August 1986 (A report for the U.S. Nuclear Utility Industry, developed by: Lelan F. Sillin, Jr, past Chairman Northeast Utility, past Chairman of INPO; Marcus A Rowden, former Chairman of the NRC; Eugene P. Wilkinson, first President of INPO: [The Sillin Report])

14. "We note, in this regard, the comparative description of the U.S. nuclear regulatory approach with that followed in six foreign countries surveyed for the NRC

whose nuclear regulatory programs, from a safety standpoint, have been as successful as ours but are far less contentious (Canada, the Federal Republic of Germany, France, Japan, Sweden, and the United Kingdom).^{*} In these foreign programs, more confidence and greater reliance is placed on the facility operator to assure the public health and safety; the regulatory body follows a markedly less prescriptive approach in setting safety requirements; and the relationship between regulator and regulated is characterized by collaboration in pursuing common safety aims.

15. The prescriptive nature of the U.S. nuclear regulatory process has created an unsatisfactory working interface—one which encourages licensee dependence on NRC directives rather than licensee safety initiative. The post-TMI Kemeny Commission was sharply critical of this state of affairs.”

16. “The hard fact is that the operators of these licensed plants are in the best position to assure their safe and reliable functioning; regulation, no matter how competently and rigorously applied, cannot assume this role. That reality should be a prominent factor in the shaping of regulatory policy affecting the quality of the industry/NRC interface.”

I. Letter from the Chairman of the Advisory Committee on Reactor Safeguards to the Chairman of the Nuclear Regulatory Commission, dated, October 15, 1986

This letter cites a range of weaknesses in the NRC, including:

17. “There is a lack of direction within the Agency. The (proposed) planning process, no matter how well done, will not be executed well because the Commission has trouble, first, in articulating its priorities and second, in getting them implemented.”

18. “It (the staff) has a tendency to regulate in an economically wasteful fashion, NRC must accept its share of the blame that backfitting has been necessary and very expensive, that QA/QC requirements lead to very high costs, that “nuclear power has priced itself out of the market” in the words of one utility representative, and so on. In some cases it has established unduly conservative, expensive, sometimes unnecessary regulations (e.g., 10 CFR Part 21-Reporting of Defects and Non-compliance). The Staff builds in conservatism discipline by discipline and parameter by parameter, rather than being as realistic as the technology will support and then adding an appropriate factor of safety at the end. It seemingly does not act on the results of safety research (if in the direction of relaxation), and requirements once established are seldom relaxed. The Staff seems frequently not to arrive at practical, cost-effective ways to solve problems.”

19. “There is a adversarial relationship between the Agency and the regulated that sometimes detracts significantly from the ability of the Agency to operate in an effective and efficient manner.”

20. “It (the NRC) lacks the ability to regulate in a fashion which builds confidence and trust in the regulator. It has not exercised adequate discretion in avoiding relatively needless modification and backfits, although the performance of the Committee to Review Generic Requirements (CRGR) has been very encouraging. (There is a need to bring more operating experience to the Staff and to improve the Agency’s understanding of the operational nuances of the plants that it regulates.) We are told by industrial representatives that industry will not build new plants until it has confidence that a stable, predictable regulatory situation exists.”

21. “It (the NRC) has developed a regulatory system that is so comprehensive, and frequently so prescriptive, that both the NRC and many of the operating utilities have come to believe, or act as though they believe, that compliance with the regulations is itself sufficient to assure safety. The assumption that regulations and safety are synonymous may be dangerous and should be reexamined.”

J. Letter from the Chairman of the Advisory Committee on Reactor Safeguards (ACRS) to the Chairman of the Nuclear Regulatory Commission regarding coherence in the regulatory process, dated November 24, 1989

EXCERPTS

22. “As we have observed in a number of the referenced reports, the NRC seems to suffer increasingly from a lack of coherence in the formulation and implementation of its regulatory strategy. . . . It seems to us axiomatic that regulation will be most effective in support of nuclear safety—our common objective—if it is coherent and defensible, and thereby understood and respected by those who are regulated.”

23. “There is the problem of the Regional Administrators, who sometimes have practices that differ from each other, and from Headquarters. In the end, it is the Regional Administrators with whom a licensee has most contact, and who embody NRC in the field, and there are too many cases in which their dicta go well beyond the policies set by the Commission.”

K. Letter from the Chairman of the ACRS to the Chairman of the NRC regarding the status of the SALP process, dated December 21, 1989

24. "The SALP ratings are extremely important to the licensee, for both economic and other reasons; it is therefore essential that the process through which they are determined be as objective and credible as it is possible to make it. We recognize that there is not available a set of fully objective performance indicators and that any rating system must therefore have an element of subjectivity. It is then doubly important that the procedures incorporate a set of credible checks and balances to minimize the effect of the personal predilections of the board members.

Instead we learned from this briefing that the process is almost entirely (we were told 80 percent) in the hands of the Regional Administrator, who not only appoints most of the board from among his own personnel, but is even free to reject an [sic] SALP rating he doesn't like, and reconstitute the board as he wishes. The rating therefore provides still another weapon for the Administrator to enforce his personal views, effectively free of restraint. There is no appeal procedure. Even with the best of Regional Administrators this strikes us as unwise, with the worst it could make a mockery of coherent regulation.

During our briefing, we were variously told that the purpose of an SALP rating is to advise the Regional Administrator (though he signs it), and then to help him advise the licensee. At the end it wasn't clear which. We were also told that a licensee must exhibit a steady improvement to keep his SALP rating constant, then that he needn't, and finally that he did. If true, that is not consistent regulation. Improvement toward what end? You may wish to read the transcript of our meeting.

We could continue, but the message is that your staff has created a process which is out of control. If indeed all the questions we asked have reasonable answers, they were not known to the responsible staff elements, even during a prepared briefing devoted to the subject.

On this isolated example of incoherence, we think you should make a clear statement of the purpose of SALP ratings, insist that your staff implement that purpose and no other, insist that the staff not use the ratings as weapons to enforce obedience to idiosyncratic policies that are not yours, greatly dilute the Regional autarchy in the process, and institute a workable set of checks and balances. Abuses of SALP abound and they bring no credit to the regulatory process.

We also believe that this is a sufficiently important problem to justify consideration of suspension of the program and issuance of no new SALP ratings until enough reform measures are instituted to lend credibility to the process."

L. Regulatory Impact Survey of 1989/90, draft NUREG 1395 ("Industry Perceptions of the U.S Nuclear Regulatory Commission on Nuclear Power Plant Activities")

The Executive Summary of the report on this survey, prepared by the NRC staff, identifies the "principal themes of the survey" as:

25. "NRC so dominates licensee resources through its existing and changing formal and informal requirements that licensees believe that their plants, though not unsafe, would be easier to operate, have better reliability, and may even achieve a higher degree of safety, if they were freer to manage their own resources" and,

26. "licensees (utilities) acquiesce to NRC requests to avoid poor numerical Systematic Assessment of Licensee Performance (SALP) ratings and the consequent financial and public perception problems that result, even if the requests require the expenditure of significant licensee resources on matters of marginal safety significance."

M. Letter from a member of the Advisory Council on Reactor Safeguards to NRC Chairman Kenneth M. Carr regarding coherence in the regulatory process, February 15, 1990

27. "It is almost as if the NRC were created to be incoherent. There are five Commissioners and five statutory offices. There are many branches and five Regional Offices, with a kind of matrix management tying it all together. Regulatory power is spread throughout, resulting in a melange of technical positions, regulatory guides, generic letters, policy statements, undocumented pressures, enforcement actions, etc. The mechanisms for providing incentive to the various elements of the staff to test their actions in the light of Commission objectives are inadequate. Indeed those objectives are not always easy to determine, for reasons that need no elaboration here. This is not to say that anyone is deliberately misbehaving, only that too many are free to proceed in the light of their own best judgment."

N. *Letter from a member of the Advisory Committee on Reactor Safeguards to the five NRC Commissioners, entitled "Impact of the Regulatory Failure to Recognize the Law of Diminishing Returns," July 13, 1990*

28. The situation depicted in NUREG-1395 has many facets and manifestations, but in principle the morass of associated difficulties stems primarily from the lack of coherence among the NRC staff members and from their ignoring the Law of Diminishing Returns. That law is as immutable as the Law of Gravity. The particular corollary which is—and has been increasingly ignored in the regulation of operating nuclear power plants is that the extra effort necessary to achieve further imposed "improvement" in any one aspect of such a multipronged endeavor will at some point become detrimental to effective—and safe—achievement of the objectives of the endeavor as a whole. In my judgment the point where the continuing search for further "improvement" became counterproductive was reached some time ago with respect to many aspects of nuclear power plant operation."

29. "I believe and have believed for some time that there is a pervasive, insidious and ever-worsening aspect of the implementation of NRC requirements that has become detrimental to the safe operation of all nuclear power plants. The symptoms of this problem and many of its associated difficulties are dramatically revealed by the utility comments recorded at length in Appendix A (109 pages) to NUREG-1395, "Industry Perceptions of the Impact of the U.S. Nuclear Regulatory Commission on Nuclear Power Plant Activities" (Draft Report dated March 4990)."

30. "The current results of this chronic situation include:

- Frustration and resentment on the part of utility personnel at all organizational levels,
- Ever-growing, yet eternally overloaded, plant and plant support organizations. This leads to blurred lines of authority and accountability, to less effective communication, and to impaired understanding and cooperation between support groups,
- Creation of vastly more extensive procedures, training programs, correspondence and paper work of all sorts, reviews and audits, recordkeeping and futility of commitment "control" processes,
- Greater opportunities for (and probability of) violations and "lack of responsiveness"; thus, "justification" for imposition of more "improvements,"
- Reduced opportunity and motivation for people to "stop and think" rather than to "do it by rote,"
- Increased concentration on the relatively probable and probably trivial, at the expense of the relatively improbable, but potentially serious.

In my personal judgment such a situation constitutes the basis for real and immediate concern as to the detrimental effects on nuclear safety of current NRC staff practice with respect to operational "improvements" at nuclear power plants."

O. *Survey of NRC Staff Insights on Regulatory Impact, SECY 90-250, dated July 16, 1990*

(In followup to the survey of utility personnel cited in item L above, the NRC Commissioners asked for this survey of the NRC staff. The results were reported to the Commissioners by the Executive Director of Operations in SECY 92250 Key excerpts follow.)

31. "In general, an underlying observation expressed by most of the (NRC) staff surveyed, regardless of the specific NRC program being discussed, was that licensees are extremely sensitive to NRC activities and sometimes acquiesce to avoid confrontations that could create the perception that they are unresponsive. To this extent, licensees are vulnerable to potential abuses of regulatory authority."

32. "In addition to this general observation, the following more specific principal themes emerged:

- a. Many of those surveyed felt that the NRC does not consider the cumulative impact of requirements on licensees and does not adequately communicate to licensees the priority of each new requirement.
- b. Many of those surveyed stated that the volume and scheduling of NRC activities onsite, particularly team inspections, significantly impact licensees.
- c. To a lesser extent, persons surveyed expressed the view that a continued loss of experienced professionals has depleted the knowledge and experience base of the NRC. Examples were cited where a lack of experience, training, or careful management oversight resulted in an unnecessary impact to licensees."

P. *Letter from the Advisory Council on Reactor Safeguards to Chairman Kenneth M. Carr regarding the reevaluation of the SALP program, September 12, 1990*

33. "We have concluded that the recommended programmatic changes are appropriate and generally consistent with the objectives that have been defined for the program. However, we do not believe that these changes go far enough. . . We be-

lieve that such changes are needed in the interest of improving the overall coherence of the agency's regulatory process. This view is strongly supported by the regulatory impact surveys of both licensees and staff members."

Q. Presentation to the NRC Commissioners on the State of the Industry, October 26, 1990 (A presentation to the NRC Commissioners by a NUMARC panel comprised of Messrs. Eugene R. McGrath, Chairman and Chief Executive Office of Consolidated Edison Company of New York and Chairman of NUMARC; John C. Brons, Executive Vice President of New York Power Authority; Byron Lee, President and Chief Executive Officer of NUMARC, and Joe F. Colvin, Executive Vice President of NUMARC.)

COMMENT BY THE CHAIRMAN OF NUMARC

34. "The results we have achieved so far working together in the areas of maintenance and procurement are, unfortunately, not the rule. Frankly, the view from the trenches is not so good. The cumulative impact of regulation and enforcement by the NRC and I mean both headquarters staff and the regional offices—is significant, and not always conducive to our efforts to improve our operations and our striving for excellence."

R. Letter from the President of the Institute of Nuclear Power Operations to the Chairman of the Nuclear Regulatory Commission, dated December 11, 1990

OPENING PARAGRAPHS

35. "As you are aware, there is a long-standing concern over the potentially adverse impact of this nation's regulatory process, particularly the cumulative impact on utility management's responsibilities and prerogatives related to nuclear safety. This concern has been raised in various reports in the past, including:

- Report of the President's Commission on The Accident at Three Mile Island (Kemeny Commission Report), October 1979
- Three Mile Island—A Report to the Commissioners and to the Public (Rogovin Report), dated January 1980
- A Survey by Senior NRC Management to Obtain Viewpoints on the Safety Impact of Regulatory Activities from Representative Utilities Operating and Constructing Nuclear Power Plants, August 1981
- Leadership in Achieving Operational Excellence, The Challenge for all Nuclear Utilities (Sillin Report), August 1986

Similar concerns were expressed in ACRS letters on coherence in the regulatory process and reevaluation of the SALP program (dated November 24, 1989; December 21, 1989; and September 12, 1990.)

The regulatory impact surveys conducted by the NRC in 1989 and 1990 focus on this same theme. These surveys include the following:

- Industry Perceptions of the Impact of the U.S. Nuclear Regulatory Commission on Nuclear Power Plant Activities (NUREG-1395—Draft Report, March 1990)
- Results of Industry Survey on Licensee Management Involvement in Inspections and Audits (SECY-90-205, June 7, 1990)
- Survey of the NRC Staff Insights on Regulatory Impact (SECY-90-250, July 1990)

Most recently NUMARC and industry executives described these same types of concerns in their October 26, 1990 meeting with the Commissioners.

The central problem discussed in these documents and the NUMARC briefing is consistent with the information INPO is receiving from our interactions with utilities and at the nuclear plants."

S. Letter from NUMARC on behalf of the industry in response to a request for comments on SECY-90-347, "Regulatory Impact Survey Report," January 28, 1991

36. "Unfortunately, the corrective actions proposed in SECY-90-347 fall short of addressing the significant, long-standing and pervasive problems in the regulatory process identified by the survey and will not correct the underlying causes of those problems. The recommended actions fail to address the two principle themes that were developed by the staff from licensee concerns with current NRC regulatory activities and attitudes."

37. "From our evaluation of the comprehensive survey information documented by the NRC we conclude that the underlying element is the need for improvement in the overall management effectiveness of the NRC in order to achieve appropriate management discipline and accountability over NRC regulatory activities and actions."

38. "... we encourage the Commission to take advantage of this unique opportunity to address the fundamental, long-standing institutional and regulatory problems and we encourage the Commission to consider the use of outside assistance to evaluate and assess management effectiveness."

T. Staff Requirements Memo on SECY-91-172, "Regulatory Impact Survey Report—Final," December 1991

KEY EXCERPTS

39. "The Commission requests that the staff prepare annual updates on progress of implementing the activities described in this paper. The program assessments should evaluate lessons reamed from the success or failure of different efforts, and from licensee assessments of these efforts."

40. "In the area of generic communications in which a new staff position is articulated or through which staff seeks additional licensee commitments (as opposed to simply disseminating knowledge gained from operational experience), the Commission should be apprised of such communications prior to their issuance. . . since generic communications do not provide formal notice and comment opportunities, efforts should be made in such canes to solicit the views of interested groups."

41. "The staff should undertake a comprehensive review of SALP results to determine whether appropriate QA controls are in place to ensure consistent and reliable evaluations. The review should: include an analysis of both intra- and inter-regional consistency of standards, procedures and results; address the mechanisms present to ensure that a national standard is present and the temporal implications ("rising expectations") are precluded; and evaluate whether sufficient controls are in place to ensure that individual inspector findings and opinions cannot unduly influence the final evaluations."

U. National Academy of Sciences Study: Nuclear Power—Technical and Institutional Options for the Future, 1992

CONCLUSIONS & RECOMMENDATIONS

42. "Nuclear Regulatory Commission

An obstacle to continued nuclear power development has been the uncertainties in the Nuclear Regulatory Commission's (NRC) licensing process. Because the regulatory framework was mainly intended for light water reactors (LWR) with active safety systems and because regulatory standards were developed piecemeal over many years, without review and consolidation, the regulations should be critically reviewed and modified (or replaced with a more coherent body of regulations) for advanced reactors of other types. The Committee recommends that NRC comprehensively review its regulations to prepare for advanced reactors, in particular, LWRs with passive safety features. Their view should proceed from first principles to develop a coherent, consistent set of regulations.

The Committee concludes that NRC should improve the quality of its regulation of existing and future nuclear power plants, including tighter management controls over all of its interactions with licensees and consistency of regional activities. Industry has proposed such to NRC.

The Committee encourages efforts by NRC to reduce reliance on the adversarial approach to issue resolution. The Committee recommends that NRC encourage industry self-improvement, accountability, and self-regulation initiatives. While Federal regulation plays an important safety role, it must not be allowed to detract from or undermine the accountability of utilities and their line management organizations for the safety of their plants."

V. Letter from Jack Brons, New York Power Authority, to Chairman Ivan Selin, September, 1992

43. "The theme develops the point that significant procurement, storage, installation, surveillance, inspection, quality control, engineering and administrative licensee resources are diverted to issues that do not contribute significantly to safety. This is not only wasteful but is shown to contribute to safety degradation."

44. "Sometimes the details of the regulations go even beyond the situation I have described thus far. In the details of the ATWS rule was a requirement for diversity. That is, the hardware was not only required to be "safety grade" but also redundant trains had to have components from different manufacturers.—This of course requires separate engineering, drawings, procedures, multiplies stock requirements, and in the increased complexity, opens the door for error. The industry, supported by the BWR owners group and the equipment designers, specifically appealed this

expensive nuance at several levels with the NRC staff and ultimately gave up at the EDO level. The value added to plant safety was never demonstrated.”

45. “On a daily or weekly basis, issues of regulatory compliance interpretation at this level of importance, or less, occupy the attention of the utility staff, require meeting with the NRC inspectors, often result in further meetings or discussions with the Resident or NRC inspectors at the regional level. . . . If a licensee chooses to disagree with the inspector, resident or regional official, he is frequently viewed as uncooperative or it is pointed out that SALP 1 plants behave differently.”

W. Letter from Mr. Nicholas S. Reynolds, Esq. Winston & Strawn, to Counsel, U.S. Nuclear Regulatory Commission, dated October 9, 1992

EXCERPTS

46. Concerning the SALP process, “A process for assessing licensee performance against subjective criteria exceeding legal requirements appears, on its face, to be unlawful. Under the Atomic Energy Act (“Act”), the NRC generally has authority to establish binding standards governing the activities of licensees by only three means: rules, regulations or orders.”

47. “Therefore, it is NRC rules, regulations and orders, adopted pursuant to the Act and in accordance with the procedural dictates of the Administrative Procedure Act (“APA”), that define standards of licensee performance. In contrast, NRC actions that compel licensees to take extra measures as a result of SALP evaluations usually are not founded on requirements prescribed through rulemaking or by an order. Rather, these extra measures are driven by the Staff’s subjective evaluation criteria. In order to be deemed an acceptable performer, a licensee must satisfy these non-regulatory expectations, these “phantom” requirements.”

48. “So postured, the SALP Program appears to exceed the authority the NRC under the Act (Atomic Energy Act). . . . In addition, NRC implementation of the SALP Program seems to be inconsistent with the APA. Specifically, the NRC, in assessing licensee performance on a case-by-case basis against standards that are not themselves law, and which indeed exceed what is the law—duly promulgated NRC regulations. SALP assessments substantially affect NRC licensees. Such assessments are action forcing. In practical terms, they compel new measures and commitments of licensee resources.”

49. “In general, the SALP Program, even with the revisions currently under discussion—remains an essentially subjective process for rating licensee performance on the basis of undefined criteria in excess of regulatory requirements. As a result, licensees are driven to make commitments of substantial resources simply to achieve better SALP scores, with no demonstrated correlation to compliance with regulatory requirements or enhancement of public health and safety. Moreover, SALP has the added effect of encroaching on licensee management prerogatives by inviting the NRC Staff to “second-guess” and, at times, preempt management decisionmaking.”

50. “The SALP Program, as implemented, appears to exceed NRC’s lawful authority under the Atomic Energy Act, circumvent the Administrative Procedure Act, bypass the NRC’s own backfilling rule (10 CFR 50.109), and premise regulation on vague and evolving standards.”

X. Letter from the President, Nuclear Management and Resources Council (NUMARC) to the Chairman, U.S. Nuclear Regulatory Commission, dated October 20, 1992

51. “The definitions of the SALP categories and the pressure from the NRC and the financial regulators to improve from a Category 3 rating “an level of performance” to a Category 1 rating—“a superior level of performance”—inevitably affects the allocation of licensee resources. The ostensible identification of strengths and weaknesses in SALP reports and assignment of specific SALP numerical “grades,” notwithstanding full compliance with all applicable regulations, results in pressure for performance to escalating standards that are far in excess of regulatory compliance. While the industry is committed to strive for excellence, this commitment to excellence cannot, and should not, be managed and directed by anyone other than the licensee. NRC pressure on individual areas, based on subjective judgments, interferes with the industry’s overall progress toward excellence and is unwarranted—the NRC’s statutory responsibility is to assure compliance with formally issued regulations. As indicated by the NRC staff in the conclusions of NUREG-1395, interference by the NRC into areas of utility management and NRC domination of licensee resources could actually be detrimental to our mutual goal of plant safety.”

52. “Thus, as implemented, the SALP process is inherently flawed. The SALP process is subjective, establishing grades based upon opinion rather than on estab-

lished and consistent criteria. This results in a "moving target" for utilities, pushing licensees beyond the scope of existing, formal regulations, even though the Commission has directed the staff, in a December 1991 Staff Requirements Memo (SRM), to ensure that the "rising expectations" of the process are precluded."

Y. *"Regulatory Review Group Charter" provided to Commission through memo from James Taylor, EDO, in response to Commission request (COMIS-92025—Regulatory Review), December 1992*

PURPOSE

53. "A detailed review should be conducted specifically for those regulations or implementation practices which appear to go beyond that which is required for "adequate protection." In conducting this detailed review, special attention will be placed on the feasibility of substituting unnecessarily prescriptive requirements and guidance with performance based requirements and guidance founded on risk insights. Revision of appropriate requirements and guidance in this manner should result in increased overall industry flexibility in plant operations without impacting reactor operational safety and may in fact contribute to operational safety."

Z. *Draft Report of the Regulatory Review Group providing the findings of the Group's comprehensive and disciplined review of power reactor regulation and related processes, programs and practices—submitted for public comment, May 28, 1993*

KEY EXCERPTS

54. "... a deficiency was found to exist in the regulations governing the processes that control changes to programs adopted by licensees to implement the regulations. . . . The Review Group found that the word "commitment" lacked both a definition and a defined change mechanism and that the plans listed have no fixed standard above which a licensee can make changes on its own volition. The lack of definition of commitment and the lack of a fixed standard for plans leave uncertain the degree of autonomy that licensees can exercise in carrying out their safety function. Additionally, the opportunity for informal backfitsto occur as part of the review and inspection processes is enhanced by the lack of definition and standard. The contribution to regulatory burden from past commitments beyond what is required by the regulations is potentially large. . . ."

55. "In the past, numerous generic letters were issued (in 1980, 113 were issued) to address programmatic resolution of specific items or very large issues, such as TMI action items. As a result of what has been considered a proliferation of generic communications (as identified by the industry over the past several years, including during the Regulatory Impact Survey), three major weaknesses with the implementation of generic communications were recognized. These were: (1) the staff rarely considered the cost of the request in the generic letter; (2) the industry had no opportunity to comment or participate in the technical resolution of an issues until the requests for information were spelled out in the generic letter; and (3) there was not always a clear tie from the requested action to the regulations."

AA. *Letter from NUMARC to the NRC Regulatory Review Group submitting comments on the group's report, July 1993*

56. "We endorse the central theme in the report that most of the apparent inflexibility in regulatory requirements does not reside in the regulations, but rather in the implementing practices and associated guidance documents. The over-emphasis on implementing practices often has created an inflexible environment where the methods of compliance have taken on greater significance than the legal requirements themselves. This environment, in turn, results in unnecessary expenditures of NRC and industry resources without commensurate safety benefit. Before performance-based regulatory approaches can be developed and successfully implemented, a clear distinction between formal regulatory requirements and informal regulatory guidance must be established, both in principle and practice."

We also endorse the implicit finding of the report that, all too often, informal regulatory mechanisms are employed as substitutes for formal regulatory requirements. . . . burdens should not be imposed on licensees that are not necessary to ensure an adequate level of protection or where the costs, both direct and indirect, of a proposed NRC action do not provide a commensurate safety benefit, thereby distracting licensees from more safety-significant actions."

BB. Report of Regulatory Review Group (Final), August 1993

SUMMARY

57. "The Regulatory Review Group has conducted a comprehensive and disciplined review of power reactor regulation and related NRC processes, programs, and practices for their implementation. In conducting this review, special attention was placed in the feasibility of substituting performance-based requirements and guidance founded on risk insights for existing prescriptive ones. The Review group then went beyond specific documents and examined the processes that use and generate documents with the view that the documents are a product of a process. This examination of processes included industry's role and their potential roles. The findings and recommendations of the Review Group focused on identifying specific problems, their causes and achievable solutions."

Note: The NRC action plan to implement the Regulatory Review Group report has not yet been released to the public. Any NRC corrective actions that have been proposed to address identified problems are, therefore, unknown at this time.

Attachment B

Illustrative Chronology of Repeated Criticisms of the NRC

Issue/Conclusion	Regulatory Review Task Force Briefing (1994) ^a	National Academy of Sciences (1992) ^a	Regulatory Impact Study (1989)	Regulatory Impact Study (1981)	Regulin Report (1980) ^a	Kremer Report (1979) ^a
Actual NRC Regulatory Practices Conflict With Its Publicly Stated Approach	X	X	X	X		
NRC's approach to regulation is negative and punitive rather than performance-based	X	X	X	X		
Licenses expend significant resources on non-regulations that are not related to safety	X	X	X	X	X	
The NRC is often highly prescriptive	X	X	X	X	X	X
The NRC has involved itself in issues that go far beyond regulation and has encroached extensively upon license management prerogative	X	X	X	X		
The NRC performs assessments based on subjective criteria	X	X	X	X	X	
Most licensees are reluctant to discuss concerns with the NRC due to fear of retribution		X	X	X		
Inconsistent and Subjective Regulation has Significant Undesirable Consequences	X	X	X	X		
Since interpretation of regulations is essentially left to each individual at the NRC, they are inconsistently applied and the NRC seems reluctant to enforce consistency	X	X	X	X	X	
Criteria for Watch List placement or removal are unclear and undocumented			X	X		
The NRC Does Not Exercise Adequate Management Control And Oversight Of Itself		X	X	X		
Significant overlap, duplication and conflict in roles and responsibilities within NRC	X	X	X	X	X	X
NRC does not appear to manage its personnel effectively or hold them accountable		X	X	X	X	X
The NRC's Actions In The Public Arena Are Counterproductive To Sound Regulation And Public Trust			X	X		
Through its public interactions, the NRC projects a picture of the nuclear industry to the general public that is often inaccurate, incomplete or misleading			X	X		
Recent NRC Practices Add Little Improvement To The Safety Margin Of Nuclear Plants	X	X	X	X		
NRC focus on unimportant detail and non-safety activities diverts management attention and resources from important plant issues	X	X	X	X	X	X
The NRC Is Unable To Address Its Own Management Problems			X	X	X	X

Note: (a) Study scope was limited and may not have reviewed items not marked with an "X."

Source: "Nuclear Regulatory Review Study," Final Report, Towers-Perrin, October 1994.

ATTACHMENT C

Nuclear Energy Industry Recommendations For Improving NRC's Regulatory Culture

NRC needs a new plant assessment process that:

- Objectively measures the safety performance of nuclear power plants through quantitative measures;

- Accurately communicates the safety performance of nuclear power plants to the public and other stakeholders; and

- Provides actionable thresholds to distinguish when licensee action is appropriate and when regulator action is appropriate.

NRC's enforcement policy needs an improved safety focus.

- The increase in industry violations is inconsistent with improving industry safety performance; and

- Violations of low safety significance consume NRC and industry resources. Minor discrepancies should not be cited, but rather, recorded in inspection reports.

NRC must expedite risk-informed, performance-based regulation.

The nuclear industry shares NRC's vision of the potential benefits of this approach; and

- The current NRC approach is too slow and creates a reluctance on the industry's part to invest in this area. The following examples illustrate this point:

- NRC staff took 4 years to issue regulatory guides for in-service inspections, in-service training and graded quality assurance—all are obvious improvements in safety and efficiency.

- The industry's proposed "whole-plant" risk study is in jeopardy of being canceled because the NRC staff is unable to act in a timely manner on even the simplest proposed item to extend post-trip hydrogen sampling times.

NRC needs strict application of the backfit rule.

- NRC staff routinely impose new, applying the backlit rule; and

- The discipline provided by the backlit rule should be applied to decommissioning issues and reflect the reduced risk posed by plants in a defueled condition.

NRC communication to licensees should reflect senior management direction and policy.

- Management does not exercise its responsibility to control individual interpretations of regulations that differ from established positions;

- Requests for Additional Information (RAI) frequently solicit commitments that exceed established positions; and More accountability has to be provided in management oversight.

NRC should conduct a task analysis of work processes to ensure timely action and effective use of resources.

- NRC takes an inordinate length of time to process licensing actions, complete enforcement activities, and promulgate rulemakings. For instance, the agency takes three to 4 years to certify dry storage containers.

NRC should eliminate duplication of effort. Examples include:

- The industry has established effective programs for evaluating events and compiling performance data;

- NRC should review licensee self assessments rather than conducting redundant inspections.

NRC must expedite the certification of dry storage containers.

- Twenty-five plants will lose full core offload capability by 2000 if they cannot expand pool storage or use dry storage technology.

- Container certifications take three to 4 years. The agency should ensure the 1-year goal for certification.

RESPONSES BY JOE F. COLVIN TO ADDITIONAL QUESTIONS FROM SENATOR INHOFE

Question 1. The GAO has concluded that the competency of a nuclear plant's management is perhaps the most critical factor in safety performance. This conclusion makes basic sense. What are the views of Panel II members on this matter? How best can the GAO recommendation be implemented, including by the NRC?

Response. The safe operation of a nuclear power plant requires effective design, engineering, operation, and maintenance by people. Management's role is to provide the training, tools and equipment, processes, procedures and direction that will allow people to do their jobs. To determine whether management is competent, one must answer the following questions: (1) Are the managers properly qualified to perform their jobs? and (2) Are the managers actually achieving safe performance?

The NRC appropriately has established qualification requirements for key safety positions at nuclear power plants, including (among others) plant managers, man-

agers of operations, maintenance, radiation protection, quality assurance, and shift supervisors, who are directly responsible for controlling the condition of the plant. These qualification requirements include education, training and years of experience. The utilities comply with these requirements, and the NRC inspects to see that they are met. Therefore, the answer to the first question is yes, managers are properly qualified to perform their jobs.

Management is effective if the safety results for which they are responsible are consistently achieved. If the results are not achieved, management effectiveness may be the cause, and further evaluation is needed. It may just as easily turn out that the cause was defective equipment or some factor outside the control of management.

The GAO recommendation to assess management competence assumes that there is an accepted model of how managers should think and act. There is no such model. Different management styles and models appear and disappear, are proclaimed to be the "true way" and then abandoned when the next fad appears. For example, one can recall such approaches as "management by objectives," "zero based budgeting," "total quality management," and "re-engineering." Effective management depends on the job situation, the environment, and the personalities and skills of the manager and the people working for the manager. It is as much an art as a science and cannot be turned into an inspection module. It is also very clear that management science has not been able to identify what style of management, or set of management attributes, predict success, or failure.

This is not to say that utilities do not attempt to provide their managers with "soft" management skills. They do. Utility executives understand the importance of management and provide training to help managers make optimal business and safety decisions. This training is provided by internal utility training programs; industry training programs such as those sponsored by National Academy for Nuclear Training, which operates under the auspices of the Institute of Nuclear Power Operations (INPO); and external training programs through universities and management consulting firms. But there is not a single approach that can be accepted in a regulatory requirement and inspected to. Senior NRC management knows this. The GAO recommendation was not well thought out and should be rejected.

The best way to implement the GAO recommendation (to assess management competence) is to establish clearly defined and objective standards for safety performance results, rather than trying to measure subjective and poorly defined attributes for management decisionmaking. [Case in point: Who was a more effective manager—General Eisenhower or General Patton? Both generals had similar education and experiences, but each had totally different management styles. Yet, each general achieved his respective objectives.] The only way to know if management is effective is by reviewing performance against objective standards and outcomes.

Industry and the NRC are in the process of defining some objective, safety-based performance standards against which to measure safety performance. If adopted, this process would identify the extent to which safety standards were being met. In addition, trending methods are included that would provide early warning of a decline in safety performance.

Question 2. You have expressed general agreement that the Watch List process—by which the NRC is supposed to provide an early warning about problem plants—is not working well. What specific changes would you recommend to improve this process?

Response. The current Watch List process does not provide clear safety guidelines or define safety requirements for the evaluated categories. The NRC's plant assessment process does a credible job of identifying the lower performing plants in the industry, but does not determine if this level of performance impacts safety. We have reviewed the safety performance data of plants recently placed on the Watch List and find that their safety performance is better than the best performing plants in 1985. As overall industry performance has improved, as shown in the attached WANG 1997 Performance Indicators, the threshold for being placed on the Watch List has increased. While it is appropriate for the industry to strive for continually improving performance, it is not appropriate for the regulator to continually change performance standards.

This very subjective process results in placing a plant on the Watch List with substantial consequences. A plant expends an average of \$200 million per reactor after being placed on the Watch List. Much of these funds are spent on issues that have little or no impact on plant safety, but are expended to satisfy the regulator that aggressive action is being taken. This condition causes two perverse impacts: (1) it diverts licensee resources from matters that have higher safety significance and (2) it usually causes a drop in company stock values and bond ratings, putting further financial pressure on the company.

The industry has proposed that the Watch List program be replaced by a process that establishes clear, objective safety performance standards with defined thresholds for regulatory action. The process also provides an operating band that defines fully acceptable safety performance in which minimal regulatory action is needed. Performance below the operating band would result in increased NRC inspection activity. The bottom of the operating band is set at a value which still provides a high margin to public health and safety and provides ample time for the NRC to increase its oversight. The approach is described in the attached paper "A New Regulatory Oversight Process" (draft 8/6/98).

Adopting the approach outlined in the paper would provide clear, objective safety performance standards, provide early warning of plant safety problems, and eliminate the uncertainty and "surprise" associated with the current process. This approach would be a more effective way of achieving the objectives of the Watch List (identifying declining plant performance to allocate NRC resources) without its inherent weaknesses.

STATEMENT OF JAMES T. RHODES, CHAIRMAN AND CHIEF EXECUTIVE OFFICER THE
INSTITUTE OF NUCLEAR POWER OPERATIONS

Thank you, Mr. Chairman. I am James T. Rhodes, chairman and chief executive officer of the Institute of Nuclear Power Operations, INPO, based in Atlanta, Georgia. The purpose of my testimony is to briefly outline INPO programs to promote safe and reliable operation of commercial nuclear power plants, and discuss how these efforts are complementary to but independent of the Nuclear Regulatory Commission; to discuss recent nuclear industry performance; and to summarize some of the more important challenges facing the commercial nuclear power industry in this country.

The Institute of Nuclear Power Operations

The mission of the Institute of Nuclear Power Operations is to promote the highest levels of safety and reliability—to promote excellence—in the operation of nuclear electric generating plants. INPO was formed by the U.S. nuclear utility industry in 1979. In carrying out this mission, INPO does not engage in public, media or legislative activities to promote nuclear power.

INPO is a nonprofit, technical organization, with all U.S. utilities that operate commercial nuclear power plants being a member. In addition to these domestic member utilities, nuclear operating organizations in 15 other countries, and 12 nuclear steam supplier and architect-engineering and construction firms from around the world, participate in INPO's international and supplier participant programs, respectively. To ensure credibility with its members and with the Federal Government, INPO maintains its independence with respect to any individual member and with respect to government agencies.

To carry out its mission, INPO has four cornerstone programs:

- On-site evaluations of each operating nuclear plant in the United States
- Training, and the accreditation of training programs, for key plant personnel
- Analysis of events and communication of lessons learned from such events; and
- Assistance to members in a broad range of areas pertaining to nuclear plant operations

The Institutional Plan for the Institute of Nuclear Power Operations and our 1997 Annual Report provide additional details about INPO's programs and are attached to my written testimony (Attachments A and B).

INPO's relationship to NRC

INPO is independent from, but its role is complementary to, the NRC. The ultimate goal of both organizations is the same—to protect the health and safety of the public by helping ensure safe nuclear plant operations. However, the means by which we strive to achieve that goal are quite different.

The President's Commission on the Three Mile Island Accident—the Kemeny Commission—observed in 1979 that strict NRC safety regulations are necessary for nuclear safety, but, standing alone, those regulations are not sufficient for nuclear safety. The Commission stated in its report to President Carter that: "We are convinced that regulations alone cannot assure safety." What was needed alongside the NRC's basic regulations was for the men and women who run our country's nuclear plants to have a deep commitment to excellence in the pursuit of nuclear safety. This professional commitment to excellence simply cannot be mandated by regulations, no matter how strict. INPO was created to help build this commitment, and it has done so. Accordingly, INPO was not created to supplant the regulatory role

of the NRC, but to provide the means whereby the industry could, acting collectively, make its nuclear operations safer and more reliable. INPO recognizes that a strong and capable regulator is in the best interest of nuclear safety and the nuclear industry.

Summary of industry safety performance

Over the past decade our country's nuclear plants have become safer and more reliable. This improvement is reflected in a set of 10 objective, performance-based safety performance indicators the U.S. commercial nuclear power industry uses to monitor the safety and reliability of nuclear plants. This set of indicators has been adopted by the World Association of Nuclear Operators, and is now used worldwide.

I won't today discuss each performance indicator in detail—a listing of the indicators is provided in the INPO Annual Report included as an attachment to my written testimony.

An example is safety system performance.

This indicator monitors the availability of three important standby safety systems at nuclear plants. The industry's goal is to encourage a high state of readiness, with at least 85 percent of these systems meeting specific year 2000 goals for availability in excess of 97 percent. As you can see, the industry trend shows significant improvement. The 1997 value represents strong performance well exceeding the year 2000 goal.

Another example is the performance indicator index, which is a weighted composite of the individual indicators. This graph of the performance indicator index illustrates the industry's dramatic overall improvement since 1985.

Another important indicator of improved industry performance is the trend of significant events at nuclear power plants. This trend is based on data from the NRC and corroborated by INPO data. The data shows a decrease in the number of significant events from 2.38 per unit per year in 1985 to 0.10 at the end of 1997. This represents a decrease of more than a factor of 20 over the past 12 years, a remarkable achievement.

These are examples of the significant performance improvement the industry has achieved over the past 12 years. Now, let me conclude my testimony with a brief summary of current and future nuclear industry challenges.

Current and Future Industry Challenges

Primarily due to impending economic deregulation of electric utilities, the commercial nuclear utility industry faces strong competitive pressures that are forcing unprecedented change. Many factors are involved, but the bottom line for the nuclear industry is that nuclear plants must operate not just safely and reliably, but also economically, to compete with alternative energy sources such as coal and natural gas. Nuclear plants that can achieve a high level of safe, reliable performance will succeed; those that cannot, will not survive.

Although the industry has demonstrated a clear, sustained trend of improvement over more than a decade, we must consider the potential impact of the current economic and regulatory environment on the industry. We believe the NRC needs to carefully evaluate its methods and processes to ensure they are effective in light of the improved industry performance. The agency plays an important role in the commercial nuclear power industry. We believe this role can best be served if the NRC focuses on issues that directly relate to public health and safety, minimizing any subjective, non-safety-related regulation that distracts both NRC and utility resources. Additionally, there must be close connection between the expectation of the Commission and senior officials at NRC and what actually happens in the field at the utility and plant interface. This last subject was addressed in more detail by Dr. Zack T. Pate, at the July 17, 1998 public meeting on stakeholder concerns, and I will not repeat his comments here. However, a copy of that transcript will be submitted for the record.

Subject to your questions, this concludes my testimony. Thank you.

RESPONSES OF JAMES T. RHODES TO ADDITIONAL QUESTIONS FROM SENATOR
LIEBERMAN

Question 1. "The Government Accounting Office (GAO) has concluded that the competency of a nuclear plant's management is perhaps the most critical factor in safety performance. This conclusion makes basic sense. What are the views of Panel II members on this matter? How best can the GAO recommendation be implemented, including by the NRC?"

Response. 1.a. With respect to the first portion of the question, "What are the views of Panel II members on this matter (the importance of the competency of nu-

clear plant management)?” it is the opinion of Institute of Nuclear Power Operations (INPO) that competency of management is only one of several key factors that are important to safe reliable nuclear power plant performance.

Competency, as used here, is defined as technical qualifications and experience needed by incumbents in key management positions. Such qualifications and experience have been established by the industry and documented in plant technical specifications and American National Standards Institute (ANSI) qualification standards. They are normally attained by formal education, plant specific training and experience, and other training to be completed prior to, or shortly after, assuming key management positions.

Utility management reviews the technical qualifications of candidates they intend to promote to key positions. They compare the individuals’ education, training, and experience against the established standards for the positions. They then take steps to ensure appropriate education, training, and experience is attained prior to placing the individuals in the positions.

As part of their Standard Review Plan, the Nuclear Regulatory Commission (NRC) staff routinely reviews technical qualifications of managers assuming key positions.

It is considered that the technical qualifications required of key managers and the process to help ensure only technically qualified individuals are placed in key management positions is well established, exercised, and verified.

1.b. With respect to the second part of the question, “How best can the GAO recommendation be implemented, including by the NRC?”

The recommendation referred to is, “Require that the assessment of management’s competency and performance be a mandatory component of NRC’s inspection process.”—(GAO report, “Nuclear Regulation: Preventing Problem Plants Requires More Effective NRC Action” dated May 30, 1997)

Competency is addressed in the answer to question 1.a. above and is therefore not repeated here.

Performance of managers once in key positions is the second part of this question. Our experience at INPO has shown us that there are many management styles in place at nuclear plants, and no one style is correct for all plants. What is important is not what management style is used but how well key managers work together to achieve safe, reliable plant operations. Accordingly, in the INPO evaluation process, we do not look at management style but at the effectiveness of the management team. The best measure of such effectiveness is overall plant performance. INPO provides feedback to utility senior management on overall plant performance, noting areas of strength and areas where management can be more effective.

The best way to evaluate management competency and performance is to establish clearly defined, objective standards for safe, reliable plant performance. Then, measure management performance against how well these objective standards are met. Trying to measure performance against subjective attributes of what makes a manager effective is not considered useful for the NRC or any other external organization.

Over the years, INPO has established clearly defined, objective standards of excellence for plant operations. It is to these standards that INPO evaluation teams measure plant performance.

For the NRC, we believe the objective standards for safe and reliable plant operations being developed by the industry, as documented in the Nuclear Energy Institute (NEI) draft paper entitled “A New Regulatory Oversight Process,” go a long way to establish objective standards to which the NRC should measure how well basic public health and safety is protected. (It should be noted that these standards are different from INPO’s standards of excellence. However, it is appropriate that these two independent organizations [NRC and INPO], with complementary but different missions, use different standards to measure plant performance.)

The paper, which has been provided to you by NEI, describes industry recommended, objective, safety-based performance standards. It recommends these standards be used by the NRC to measure plant safety performance with respect to public health and safety. If adopted, this new process will help identify the extent to which these standards are being met. In addition, trending methods are included to help provide early warning of declines in safety performance, giving the NRC time to respond to such declines before they adversely affect public health and safety.

As it looks at revising its regulatory oversight process, it is our opinion that the NRC should consider in detail the concepts presented in the NEI draft paper. If the proposed process were adopted, this action should go a long way in addressing the GAO recommendation concerning NRC’s assessment of management performance.

Question 2. “You have expressed general agreement that the Watch List process—by which the NRC is supposed to provide an early warning about problem plants—is not working well. What specific changes would you recommend to improve this process?”

Response. The industry’s primary concern with the Watch List process is the lack of definition of what constitutes a decline in performance warranting placement on the list. By every objective measure, including the performance indicators used by the NRC, safety performance of the industry has improved steadily over the years. In fact, the safety performance of recent watch list plants is better than most top-performing plants in 1985. Yet, the Watch List contained up to 13 plants within the past year.

As discussed in the answer to question 1.b., we believe the standards for safe, reliable plant operations being developed by the industry, as documented in the NEI draft paper entitled “A New Regulatory Oversight Process,” go a long way to establish objective standards to which the NRC should measure how well basic public health and safety is protected, and the need for a specific “watch list” will be eliminated.

STATEMENT OF GARY JONES, ASSOCIATE DIRECTOR, ENERGY, RESOURCES, AND SCIENCE ISSUES, RESOURCES, COMMUNITY AND ECONOMIC DEVELOPMENT DIVISION, GENERAL ACCOUNTING OFFICE

NUCLEAR REGULATORY COMMISSION: PREVENTING PROBLEM PLANTS REQUIRES MORE EFFECTIVE ACTION BY NRC

Mr. Chairman and Members of the Subcommittee: We are pleased to testify on how the Nuclear Regulatory Commission (NRC) oversees the nuclear power industry. Among other things, NRC is responsible for ensuring that the operation of the nation’s 103 commercial nuclear power plants occurs in a manner that adequately protects public health and safety. Identifying nuclear plants with safety problems and making sure that their owners—the licensees correct safety problems promptly are essential to NRC’s safety mission. This becomes even more critical as NRC begins to regulate safety in an environment of electricity deregulation.

Our testimony is based on our May 1997 report about preventing problems at nuclear power plants.¹ Our testimony discusses how NRC defines nuclear safety, some of the causes for weaknesses in how NRC oversees nuclear plants that have problems, and the challenges ahead for NRC safety regulation.

In summary, our 1997 report points out that the Congress and the public need confidence in NRC’s ability to ensure that the nuclear industry performs to high safety standards. While our report did not make judgments about the safety of nuclear plants or the appropriateness of NRC’s current regulatory structure, the many safety problems identified at plants we examined raised questions about whether NRC’s regulatory program was working as it should, and we made recommendations to strengthen it. Specifically we found that:

NRC assumes plants are safe if they operate as designed and follow NRC’s regulations. However, all three facilities we examined—the Millstone Nuclear Power Station in Connecticut, the Salem Generating Station in New Jersey, and the Cooper Nuclear Station in Nebraska—were operating outside of their approved designs. NRC reasoned that these plants were still safe because the many safety features and systems built into a plant’s design provide an adequate margin of safety. However, changes made to plants over time, such as replacing components with different parts and reconfiguring systems, can alter a plant’s design, thus potentially affecting how certain safety systems might work in an emergency. NRC has found other plants that are not operating as designed and is exploring the reasons that the licensees have not maintained current information on their design changes and have not examined the impact of such changes on the safe operation of plants. Ambiguity over “how safe is safe” arises because NRC does not have an effective way to quantify the safety of plants that deviate from their approved designs.

The three nuclear plant facilities that we examined had longstanding safety problems, and NRC did not take aggressive action to ensure that the licensees fixed their safety problems in a timely way. These problems ranged from failures of equipment to work properly when tested, to weaknesses in how licensees’ conducted their maintenance programs. As a result, the plants’ conditions worsened, reducing safety margins. NRC staff repeatedly extended the amount of time it allowed the

¹[Nuclear Regulation: Preventing Problem Plants Requires More Effective NRC Action (GAO/RCED-97-145, May 30, 1997).

plants' operators to make corrective actions. In addition, although nuclear industry and NRC officials agree that the competency of a nuclear plant's management is a critical factor in safety performance, in the early 1990's, NRC eliminated management assessment in streamlining its inspection guidance. Furthermore, NRC was slow to place plants with declining performance on its "Watch List," which is a tally of plants whose declining performance trends require closer regulatory attention.

NRC faces many challenges to make its regulatory program work as effectively as it can, particularly in light of major changes taking place in the nuclear industry. As the electric utility industry deregulates, safety margins may be compromised when licensees cut costs to stay competitive. According to one utility industry study, as many as 37 of the nation's nuclear sites are vulnerable to shutdown because production costs are higher than the projected electricity prices in the market. Decisions that NRC will be making include how safe is safe, and what should be the nuclear plant regulatory approach of the future. NRC's regulatory approach needs to be anchored in goals and objectives that are clearly articulated, and performance measures that hold NRC managers as well as licensees accountable.

Background

Commercial nuclear plants in the United States operate in 31 states and provide about 20 percent of the nation's electricity. Five states (Connecticut, New Jersey, Vermont, South Carolina, and Illinois) rely on nuclear power for about half of their electricity. NRC licenses the construction and operation of nuclear power plants, which are owned and operated by both public and private utility companies; develops, implements, and enforces the rules and regulations that govern nuclear activities; inspects facilities to ensure compliance with legal requirements; and conducts research to support its programs. NRC's fiscal year 1998 budget authorization is \$472.8 million, and it has requested \$488.6 million for fiscal year 1999. Its staff of about 3,000 is responsible to five Commissioners appointed by the President and approved by the Senate. About 55 percent of NRC's professional staff are dedicated to nuclear reactor activities.

NRC Does Not Precisely Define Nuclear Plant Safety

Determining the safety of plants is difficult because NRC does not precisely define it. Instead, NRC presumes that nuclear plants are safe if they operate within their approved designs (design basis) and meet NRC's regulations. However, NRC's regulations and other guidance do not provide either the licensees or the public with the specific definitions and conditions that define the safety of a plant. As a result, NRC does not have an effective way to quantify the safety of plants that deviate from their approved designs or violate regulations. Determining a plant's safety condition is, therefore, a subjective judgment.

NRC reasons that the many safety features and systems built into a plant's design provide an adequate margin of safety, even when some of them are not working properly. System redundancies—the duplication of a plant's safety systems, structures, and components provide in-depth protection to help prevent an accident from releasing radiation to the public. This concept, also known as defense-in-depth, forms the foundation of NRC's confidence that nuclear plants are safe, even those that may be shut down for safety problems.

The conditions found at Millstone in 1996, however, challenged NRC's confidence that it can rely on licensees to ensure that the plants are operating within their approved design basis. A special NRC inspection team found a number of significant equipment problems and concluded that the licensee had not consistently met its license and regulatory requirements. NRC's inspectors were unaware of the extent of these problems—some of which were not reported by plant managers—and thus discovered that the Millstone plants were operating outside their design bases. As a result of the conditions found at Millstone and at other nuclear plants, NRC is now reemphasizing the need to determine if plants are still operating within their design bases. The safety significance of design basis issues are hard to quantify because NRC does not precisely define safety. Perceptions of safety levels and risk are subjective and are not always consistent from inspector to inspector. Several current and former NRC inspectors told us that they cannot easily distinguish a safe plant from an unsafe one, and that the guidance on when to shut down a plant does not cover all situations.

NRC has incomplete knowledge about the extent to which nuclear plants are operating within their design basis. Since the mid-to-late 1980's, NRC has found that some licensees were not documenting changes made to their plants that could affect their approved design basis. However, it was not until October 1996, after the problems were discovered with Millstone, that NRC required licensees to certify that their plants were operating within the plant's design basis. To follow up on licens-

ees' certifications, as of May 1998, NRC had inspected 16 sites to verify that the plants were operating under the terms and conditions of their licenses.² Generally, NRC found that some utilities had not maintained current information on the design basis and had not examined the impact of modifications on safe plant operations. NRC identified significant problems during these inspections, including instances in which licensees had not properly tested safety related components, and had made errors in their analyses for how emergency cooling systems would work during a potential accident. NRC has concluded that the majority of the problems resulted from errors in the original design or from design modifications, inadequate testing, and discrepancies in documentation.

NRC Is Not Effectively Overseeing Problem Plants

Identifying and correcting safety deficiencies are among the licensees' most important responsibilities, and these are a major focus of NRC's nuclear plant inspection program. NRC's regulations require that nuclear plants have an effective program to "assure that conditions adverse to quality . . . are promptly identified and corrected." And NRC places importance on evaluating plants' corrective action programs to ensure that they will lead to timely correction of the identified problems.

For the three facilities with a history of poor performance that we examined (Millstone, Salem, and Cooper), we found that the licensees failed to fix their substantial and recurring safety problems in a timely manner. Most of these problems were equipment failures. At Salem, for example, an air control system and a water pump motor had not worked properly for over 6 years. NRC allowed these licensees repeated opportunities to correct their safety problems, by relying on licensees' corrective action plans that were never fully completed, by accepting management's promises to fix problems (though these promises were not always met), and by using enforcement actions too late to effect change. For example, some of the problems causing the 1994/1995 shutdown of the Cooper Nuclear Station dated to the plant's first start-up in 1974-problems Cooper's management should have addressed years earlier, according to the NRC inspectors we interviewed. An NRC audit reported that the plant managers were "living with problems, not fixing them" and that "ineffective self-assessment" and a "weak corrective action program" characterized operations. However, NRC allowed Cooper to restart its reactors after the 1994/1995 shutdown on the basis of the licensee's promises to fix these recurrent problems and contingent upon Cooper's monitoring of its own progress. After showing improvements over several months, the plant's performance quickly declined. Then NRC discovered that many of the safety problems that Cooper's management had promised to correct had not been corrected.

Another tool NRC uses to obtain compliance with its regulations is its enforcement program of fines and sanctions, which is designed to correct violations promptly, deter future violations, and encourage licensees to operate their plants safely. However, NRC was very slow imposing fines on the three plants we examined.

Salem's fines were levied by NRC well after the plants were in periods of significant decline, and at the time our report was issued, NRC still had not completed its enforcement action against Millstone for violations that were first discovered in 1995. NRC can also prevent shutdown plants from restarting until all of their safety deficiencies are addressed, but this action sometimes has occurred long after plants' deficiencies were documented.

We recommended that NRC aggressively act on identified problems and then document what it will do if safety problems go uncorrected. NRC's Chairman has complained about the consequences of NRC's patience with some problem licensees, adding that the Commission is reviewing its internal processes to strengthen its ability to identify and act on licensees' corrective action programs. NRC officials agree that they need to do a better job of making licensees fix their problems, and will bring licensees' unresponsive to corrective actions to the attention of NRC's senior managers.

Management Competency Critical to Safety

The nuclear industry and NRC officials widely agree that the competency of a nuclear plant's management is perhaps the most critical factor in safe performance. NRC's audits and reviews frequently cite management weaknesses as the major cause of the declining performance at nuclear plants. For example, NRC cited a "poor management safety culture," "weak management oversight of engineering programs," a "fragmented approach" to resolving problems, and a failure to provide an

²These represent sites that NRC has identified for follow up inspections.

“adequate level of oversight”³ as underlying causes for deteriorated conditions at Cooper. Similarly, safety problems found at the LaSalle and Zion nuclear plants in Illinois in January, 1997, were attributed by NRC to weak management processes and a lack of managements involvement.

Yet, despite the importance of competent management, NRC does not have an effective process for ensuring that licensees maintain it for their nuclear plants. NRC does not assess management in its plant inspection program, and individual inspection reports specifically avoid any references to management’s competency. NRC’s references to management weaknesses are usually made retrospectively, and often only after a licensee admits to such deficiencies, or by NRC audit teams or special investigations long after the NRC has lost the opportunity to give an early warning about potential management weaknesses. NRC’s guidance to its inspectors once contained a management assessment component, but this was eliminated in the early 1990’s when NRC streamlined its inspection process.

Although NRC’s regulations do not require the evaluation of plant management before a license to operate a nuclear plant can be issued, NRC must determine if the prospective licensee is “technically and financially qualified to engage in the activities authorized by the operating license.” Because such qualifications could also reflect on a licensee’s overall ability to manage a facility competently and safely, we recommended that NRC assess management competency and performance as part of its inspection process. A 1996 report to NRC by Arthur Andersen also points out the importance of evaluating management, particularly for NRC to be effective in actively assessing plant performance. The report recommended that NRC hire experts or train staff to evaluate management’s performance and changes in management.

NRC agrees that management’s competency is critical to a licensee’s operational safety performance and told us that its existing evaluation processes draw conclusions about the effectiveness of licensees’ management. NRC staff have proposed options to assess the performance and competency of licensees’ management, which include changes in inspection procedures, more staff training, and use of consultants. But the Commission rejected these options in June 1998, and instead directed NRC staff to continue with the current practice of inferring licensee performance from existing plant inspections and other routine assessments. The Commission also withdrew resources specifically directed at developing a systematic method to assess licensees’ competency and management. While we are continuing to study NRC’s rationale for its decision as part of our ongoing work, we continue to believe that evaluating licensees’ management competency as part of plant inspection would provide a important early warning of potentially unsafe practices.

Early Intervention Could Result In Fewer Problem Plants

NRC’s process to focus attention on those plants with declining safety performance—the semiannual Senior Management Meeting—needs substantial revisions to achieve its purpose as an early warning tool. NRC collects enormous amounts of information on nuclear plants, both from its own inspectors and from the nuclear plant licensees. Taken together, these sources provide NRC with a database to measure and monitor plants’ safety conditions and safety performance. Despite this database, NRC has been slow to identify and place problem plants on its “Watch List.” The Watch List is NRC’s tally of plants whose declining performance trends require closer regulatory attention. Yet, the List is an important early warning tool for NRC to target its regulatory emphasis, allowing small problems to be corrected before they lead to costly shutdowns.

The Salem and Millstone plants were under discussion by NRC for 3 to 4 years before they were placed on the Watch List in 1996 and 1997, respectively. NRC discussed the Cooper facility as a problem plant but never placed it on the Watch List, even though it was eventually shut down for safety reasons. As of May 1997, when we did our analysis, 41 plants, or more than a third of the nation’s nuclear power plants, had been placed on the Watch List by NRC since 1986. Twenty-four plants had been on the list for 2 or more years. However, about half of the plants on the Watch List were known by NRC to be poor performers long before being listed. Moreover, the Arthur Andersen report identified 10 plants that were not placed on the Watch List but whose performance indicators were similar to those that are listed.

This inconsistency has been attributed, in part, to the lack of specific criteria for making decisions on a consistent basis, the subjective nature of the process, and some NRC managers’ confusion about their role in the process. Industry and private

³Supplemental Plant Performance Review, NRC (95–04, Oct. 3, 1995).

interest groups alike have criticized NRC for not having specific criteria with which to decide when plants should be placed on the Watch List.

NRC acknowledges that it should do a better job of identifying plants deserving attention for and listing on the Watch List. NRC is developing a new process for assessing plants' performance. Among other things, the new process would eliminate the Watch List, replacing it with a process that would include a decision model or criteria so that, according to NRC, its actions are predictable, informed regarding risk, simple, nonredundant, and efficient. NRC expects to publish the proposed process for comment early in August 1998, and hopes it will be in place by 1999.

Challenges NRC Faces Regulating in an Evolving Environment

At the heart of safe operations is holding the licensees accountable for fixing their plants' problems more promptly and addressing management issues more directly. However, changing NRC's culture will not be easy. The need to ensure that NRC's regulatory program works as effectively as it can is extremely important, particularly in light of major changes taking place in the nuclear industry.

NRC officials are concerned that as the electric utility industry is deregulated, safety margins may be compromised as licensees cut costs to stay competitive. As an example, an independent auditor's review of the Millstone plant in 1996 noted that the need to trim costs in the face of future competition resulted in managers' choosing to defer maintenance and allow backlogs of corrective actions to grow, eventually creating a situation that led to a shutdown and several hundred million dollars worth of repairs.

Several estimates have been made about the number of plants that might no longer be economically competitive. A private research report concluded that because competition will result in lower electricity prices in the future, as many as 37 of the nation's nuclear sites are vulnerable to shutdown because production costs are higher than the projected electricity prices in the market.⁴ Together, these sites represent over 40 percent of the U.S. nuclear generating capacity.

For those plants that will continue to operate, NRC reports that the nuclear industry has matured to the point that plants have been in operation long enough for aging to be a major issue that can affect cost and safety. Aging, which affects all of a plant's systems and components, can bring conditions causing safety concerns that, if not appropriately addressed, could require licensees to shut down plants. Already, two plants have formally requested a license extension and others plan to operate beyond their original 40 year operating lives.

NRC is moving to "risk-informed" and "performance based" reactor regulation, which aims to focus regulatory resources on areas of the highest safety significance and its regulatory framework more results oriented. It is also making changes to the Senior Management Meeting process. These changes illustrate an effort by the current Chairman and Commissioners to improve NRC's ability to help ensure safe operation of the nation's nuclear power industry as well as address industry concerns regarding excessive regulation.

Questions that NRC will be facing include how safe is safe, what will the future NRC regulatory approach be, and what level of resources will be needed to regulate the Department of Energy's nuclear facilities? Whatever NRC decides in answering such questions needs to be anchored in goals and objectives that are clearly articulated and performance measures that hold NRC managers as well as licensees accountable. In addition, NRC needs reliable information on which to determine safe operations, training for its staff, and an enforcement structure that clearly lays out a range of sanctions that it will impose on the basis of the potential seriousness of the safety problems found.

A framework within which NRC can accomplish its missions has been provided by the Government Performance and Results Act of 1993. The Results Act requires Federal agencies to develop goals, objectives, strategies, and performance measures in the form of strategic and performance plans. In our review of NRC's first annual performance plan, which covers the program activities set out in its fiscal year 1999 budget⁵, we noted that the plan could provide a clearer picture of the intended performance across NRC and better discuss the strategies and resources the agency will use to achieve its performance goals. For example, nuclear reactor safety is a "strategic arena" in NRC's strategic plan. While the plan lists specific strategies NRC will use against licensees that fail to meet regulatory standards, including

⁴Nuclear Power Plant Shutdowns and Implications for Future Natural Gas Demand, Washington International Energy Group (Feb. 1997).

⁵Results Act: NRC's Annual Performance Plan for Fiscal year 1999 (GAO/RCED-98-195R, May 27, 1998)

halting operations if licensee performance falls below an acceptable level⁶, NRC has not developed specific criteria for "acceptable." Moreover, the performance plan does not provide confidence that the agency's performance information will be credible. The development of strategic and performance plans is a dynamic process. As the Congress and NRC gain more experience in setting goals and measuring results, better information will be available to evaluate progress towards improving NRC performance.

Mr. Chairman and Members of the Subcommittee, this concludes our statement. We would be pleased to respond to any questions you may have.

RESPONSES BY GARY JONES TO ADDITIONAL QUESTIONS FROM SENATOR LIEBERMAN

Question 1. The GAO has concluded that the competency of a nuclear plant's management is perhaps the most critical factor in safety performance. This conclusion makes basic common sense. What are the views of Panel II members on this matter? How best can the GAO recommendation be implemented, including by the NRC?

Response. We recognize that there are technical challenges posed by assessing management factors as part of the NRC inspection process. To assess management, professionals with the proper training and experience would be needed, along with objective criteria for making judgments. Arthur Andersen, a consulting firm hired by NRC to recommend ways to improve how NRC conducts its plant safety assessments, noted the importance of management, stating that "To assess plant performance proactively, the NRC needs to remain fully aware of plant management activities."¹ In their 1996 report to NRC, Arthur Andersen recommended that NRC hire experts or train staff to evaluate management performance and changes, which they viewed as necessary steps to allow NRC to be more proactive. They also noted that by evaluating management factors (and other factors as well), NRC would be better positioned to identify problems earlier, which would in turn reduce safety risks to the public and lead to an earlier and less costly resolution of problems. We agree with Andersen's recommendations.

However, in responding to our report (Nuclear Regulation: Preventing Problem Plants Requires More Effective NRC Action (GAO/RCED-97-145, May 30, 1997), NRC rejected our recommendation to include a management assessment component as part of their ongoing plant inspection process. While NRC agreed that licensees' management is "instrumental" in the licensee's operational safety performance, they told us that they studied the matter and decided that a management assessment would "not likely result in a leading indicator of plant performance. . . ." NRC staff presented options for including a management assessment component in their inspection process to the Commission. The Commission also decided not to use licensee management performance or competency as a leading indicator measure.

Question 2. You have expressed general agreement that the Watch List process—by which the NRC is supposed to provide an early warning about problem plants—is not working well. What specific changes would you recommend to improve this process?

Response. The Watch List is an important outcome of NRC's Senior Management Meeting (SMM). The SMM process was created in 1986 for the purpose of providing NRC with an early warning on plants exhibiting declining performance. SMM meetings, which are held twice every year, include NRC's senior managers from headquarters and regional directors. Data on plant performance are drawn from NRC's performance indicator program and from inspection and audit reports so that senior managers can take steps to prevent the problems at these plants from worsening. A plant's inclusion on the Watch List can lead to more oversight by NRC in the form of additional inspections, letters to licensees expressing NRC's concern about declining performance, or other actions. Being on the Watch List also brings significant public attention to the plant.

As we reported, the Watch List has not produced a consistent inventory of plants with performance problems. The Millstone and Salem plants exhibited clear performance declines long before NRC placed them on the Watch List in 1996 and 1997, respectively. Salem was placed on the Watch List after they were forced to shut down for safety problems. Millstone was shut down several times before they

⁶Only once has NRC issued an order to shut down an operating plant, at Peach Bottom, Penn. in 1987. On other occasions, NRC has issued such orders only after the licensees had suspended operations.

¹Recommendations to Improve the Senior Management Meeting Process, Arthur Andersen (Dec. 30, 1996).

were placed on the Watch List. Thus, the Watch List actions were far too late to achieve the objective of "early identification of declining performance." Still other plants, such as Washington Nuclear Power II, had performance indicators that were consistently worse than some plants on the Watch List. In fact, Arthur Andersen identified 10 plants that were not placed on the Watch List but whose performance indicators are similar to the average of those on the Watch List.

We recommended that NRC inspection reports should fully document for all plants the status of the licensees' actions to address identified problems under NRC's corrective action requirements, including timetables for the completion of corrective actions and how NRC will respond to nonconformance with planned actions.

We also recommended that NRC should make licensees' responsiveness to identified problems a major feature of the information provided to the participants of the Senior Management Meetings, including how NRC will respond if problems go uncorrected. For example, NRC should describe the range of sanctions that it will impose on the licensees on the basis of the potential seriousness of their failure to resolve problems within a predetermined time. These sanctions should range from assessing fines to involuntary shutdown of the plant.

Arthur Andersen reported findings that parallel our observations, noting that many procedural problems prevent the process from working as intended. These problems include a lack of rigor and discipline in the process; unclear criteria for placing plants on the Watch List; and the confusion among some NRC managers about their role in the process. Also noted was the highly subjective nature of the process.

NRC agreed with us and told us it is taking steps to improve its performance indicators to allow more timely regulatory responses. However, the effectiveness of these steps remains to be seen. An equally important consideration is how NRC will react to plants with declining safety performance, once they are identified. This is where we found significant problems at the plants we examined. NRC allowed these plants to deteriorate before taking strong action. In some cases, NRC imposed fines years after the licensee was found deficient.

NRC agrees it should have been more vigilant in cases where plants were found to be in a declining safety condition, but continues to believe they have the authority and tools to hold licensees accountable. We continue to believe our recommendations are needed to ensure that NRC meets its basic responsibility to protect the safety and health of the public.

RESPONSES BY GARY JONES TO ADDITIONAL QUESTIONS FROM SENATOR INHOFE

Question 1. Ms. Jones written testimony states ". . . we [GAO] recommend that NRC assess management competency and performance as part of its inspection process."

What NRC regulation would the NRC be implementing by assessing license management competency?

What other Federal health and safety agencies assess the management competency of the regulated industry?

What criteria are used by other Federal health and safety agencies to assess management competency?

Response. The NRC has well established regulations pertaining to the inspection of commercial nuclear power plants in support of its statutory responsibility to "provide adequate protection to the health and safety of the public." We believe that plant inspections should encompass the important conditions that impact plant safety, so that licensees and NRC managers can take actions when appropriate. Because both the NRC and the nuclear industry agree that management performance is "instrumental" to safe operations, factors relating to management effectiveness would help make the plant inspection process more effective. In their report to the NRC, Arthur Andersen reported that the NRC needs to be more proactive, and recommended that instead of evaluating the leadership and operational causes of past events, the NRC should evaluate "economic, management and operational factors in order to prevent future events."

At one time, NRC did include a management performance component as part of their inspection program. And Arthur Andersen has suggested a way in which NRC can include a management assessment component in their existing inspection process.

NRC collects from licensees substantial information on the safety operations of nuclear plants. From these data, NRC tells us they "infer" management performance. Indeed, NRC makes substantial public comments about the competency of nuclear plant licensee management, often concluding that management problems are

the main reason for declining performance. For example, NRC's audits made many references to management's performance in the Commission's reviews of why conditions deteriorated at Cooper, including a "poor management safety culture," "weak management oversight of engineering programs," a "fragmented approach" to problem resolution, and failure to provide an "adequate level of oversight."² At Salem, NRC's audit reports also cited the licensee's management as a cause of safety problems.

Additionally, the NRC Chairman stated that the "... recent events at Maine Yankee ... resulted in a failure to identify and promptly correct problems arising in areas that management viewed, not always correctly, as having low safety significance."³ NRC senior managers have also stated that the principal reasons for the safety performance problems found at the LaSalle and Zion nuclear plants in Illinois were weak management processes and a lack of management involvement.

Since NRC does not hesitate to draw conclusions about management competency after the fact, we believe that such observations could also be made during the inspection process, which is the most opportune point at which potential safety related causes can be addressed. Acting on performance problems by addressing their causes before conditions worsen is the key to keeping the industry safe. Preventing problem plants from worsening also avoids the enormous costs associated with poor performing plants.

Regarding the experience in other regulatory agencies, we focused our review on how NRC meets its responsibilities to help ensure safe operation of the nations' commercial nuclear plants. We used as criteria the statutes NRC operates under and the regulations it promulgates to implement those statutes. As a result, we did not compare NRC to other agencies.

Question 2. The GAO report entitled, "Preventing Problem Plants Requires More Effective NRC Action," (GAO/RCED-97-145, at 17) states: "Both industry and NRC officials have advised us that management competency is considered the licensee's responsibility and that NRC lacks the skills and experience to properly assess management."

What Federal health and safety agency has employees who are currently trained to perform management competency assessments of the industry the agency regulates?

Specifically, what training have those employees received to qualify them to assess management competency of the industry the agency regulates?

Response. Because our focus was how the NRC meets its safety responsibilities, we did not examine how other agencies regulate. We do recognize the technical challenges posed by assessing management factors. To assess management, professionals with the proper training and experience would be needed, along with objective criteria for making judgments. We also believe that gauging management factors is critical to the goal of the early identification of the problems in nuclear plants.

Question 3. If the NRC was to make a negative determination regarding management competency (on a basis other than educational and technical qualification), can the NRC require the licensee to remove the employee from NRC licensed activity or in any way change the employee's employment status?

If the NRC makes a negative determination regarding management competency (on a basis other than educational and technical qualification) and requires the licensee to remove the employee from NRC licensed activity or to in any way change the employee's employment status, shouldn't the NRC also be responsible for defending the licensee in a wrongful termination or other employment-based suit brought by the employee?

Response. The NRC has established procedures for ensuring that licensees address deficiencies cited in inspection reports. The finding of a management deficiency, if it were part of an inspection finding, would likely be treated like any other finding. The action required would depend on the safety significance of the finding, and how the licensee plans to respond. We are not aware of the NRC ordering licensees to change their management, even in those cases where they have publicly announced that management deficiencies were the cause of safety problems.

Question 4. Ms. Jones written testimony states: "... we continue to believe that evaluating licensees' management competency as part of plant inspection[s] would provide a[n] important early warning of potentially unsafe practices."

² Supplemental Plant Performance Review, NRC (95-04, Oct. 3, 1995).

³ Remarks by NRC Chairman Shirley Jackson, November 7, 1996.

What management competency evaluative assessment criteria have been proven to be dispositive leading indicators providing an early warning of potentially unsafe practices?

Response. NRC would have to decide on the management competency components that would be crucial in assessing a plant's safety performance. Such a definition would not necessarily be limited to technical managerial skills, but rather would likely include factors that define how a safe plant should be operated. These could include factors such as how well a plant management fosters a proper plant safety culture, provides oversight, enhances communications, as well as other factors that inspectors may already be examining.

NRC and its onsite inspectors have vast experience examining the causes of declining safety performance. We believe it would be valuable if they documented all factors that directly impact the safety performance of nuclear plants.

STATEMENT OF DAVID LOCHBAUM, UNION OF CONCERNED SCIENTISTS

Good morning. I appreciate this opportunity to testify before the Subcommittee regarding this important topic. The industry representatives on this panel are justifiably proud of nuclear power's record over the past decade. Indeed, they paint a very rosy picture and argue that the industry's healthy performance warrants redirected NRC oversight effort. My objective is to caution you to watch out for the thorns as you enjoy the roses.

The industry sometimes touts its record in ways which imply that it was achieved in spite of the NRC. That's not accurate. The industry's performance over the past 10 years benefited from NRC initiatives, such as the Maintenance Rule and its need for plant-specific risk assessments, and also from the NRC's support for industry initiatives, such as cost-beneficial licensing actions.

The industry cites data such as higher plant capacity factors, fewer plant trips, and fewer safety system actuations as evidence of healthy performance. This information is valid, but it does not provide the complete picture. At this moment, nine US nuclear plants languish in protracted shut downs. These plants are not shut down because the NRC issued them too many uncited and Level IV violations or because the NRC is dragging its feet on risk-informed regulation. No, these plants are shut down because their owners failed to properly discharge their record-keeping of the how, what, when, and why information for emergency equipment, also known as design control and configuration management.

In the mid- and late-1980's, NRC inspections at several plants revealed that their owners had made physical changes to emergency equipment to solve one problem, only to cause other problems. These errors occurred because these owners had not fully understood or had lost track of the design bases for the emergency equipment. The NRC proposed a new rule that would have required all plant owners to fully document the design bases for emergency equipment and to re-create any information that was missing. The industry opposed this rule and convinced the NRC that they could handle the problem internally. So, the NRC dropped its plans for the rule.

The industry was wrong. Millstone and its fall-out have clearly demonstrated that some nuclear plants operated with vital safety systems that would not or may not have functioned had there been an accident. For example, owners of the Big Rock Point plant in Michigan reported 2 weeks ago that one of its safety systems would not have functioned during the 13 years before the plant closed last August. An NRC team discovered in 1996 that the piping for safety systems at the Haddam Neck plant in Connecticut was too small to assure adequate cooling of the reactor core during that plant's entire 28-year operating lifetime. The nine plants shut down today are fixing design control problems like these.

We should not be operating nuclear power plants unless we know with reasonable certainty that their systems needed to protect the public during an accident will work. There have been an alarming number of reports in recent years which clearly show that several plants have operated without fully functional safety systems. In cases like Maine Yankee, Donald C. Cook, Beaver Valley, Millstone, and Big Rock Point, the public was protected by luck as much as by defense-in-depth.

The industry wants to push the NRC more rapidly towards risk-informed regulation. The development of plant-specific risk assessments this past decade has provided valuable insights which prompted many plant owners to voluntarily make physical changes to their facilities that increased safety margins. Unfortunately, these risk assessments assume that the plants have no design control and configuration management problems. For some plants, this is not a valid assumption. Thus, their risk assessments are inaccurate and non-conservative. Design control and con-

figuration management problems must be corrected at all nuclear plants before risk-informed regulation can advance.

The industry cites examples of NRC over-regulation, but there are examples of under-regulation as well. Both sets of these examples are probably valid because the NRC regulates subjectively and inconsistently. In a report entitled *The Good, The Bad, and The Ugly* which we issued last month, we documented a wide gap in safety performance in our ten-plant "focus group." This discernible difference is due to the NRC's subjectivity. Instead, the NRC must develop objective standards which it consistently enforces, especially when it comes to decisions about whether problem plants should be shut down or restarted. It is a daunting challenge, but it can be done.

Commissioner McGaffigan pointed out during a recent stakeholders' meeting that the NRC does a good job on matters in its spotlight. We would agree with that contention, although we feel that the NRC needs a larger floodlight. This little penlight job just isn't going to allow the NRC to handle the important items on its plate in a timely manner. The NRC could do a better job if it developed, and used, good procedures. Procedures are like the conveyor belt in a factory they move products from station to station until the work is completed. Good procedures are like a strong, wide conveyor belt because they handle most of the work items. Bad procedures are like a thin, unreliable conveyor belt because too many items must be hand-carried through the process. The NRC really needs to have and follow better procedures.

I must comment briefly on the industry complaint about the service it gets from the NRC. In recent years, a top NRC priority has been its review and certification of advanced reactor designs. To our knowledge, a line of potential buyers for advanced reactors is not forming anywhere in the country. However, there seems to be a market for these things overseas. We do not oppose efforts to improve US trade. It is simply incomprehensible to us that nuclear safety issues such as fire barriers that are combustible linger while the certification of advanced reactor designs gets fast-tracked through the NRC. The industry is getting very good service from the NRC, compared to that afforded public health and safety.

In closing, I want to again thank the Subcommittee for providing us this opportunity to share our views with you. I would also like to respectfully suggest that in addition to having the NRC Commissioners point to where they are headed, that you formally ask them to provide you with their roadmap showing how they intend to reach that destination. Reviewing their action plan for achieving their promised improvements might make it easier for you to monitor their progress along the way. Thank you very much.

INDEX FOR DOCUMENTS SUBMITTED TO SUPPLEMENT ORAL TESTIMONY

Millstone Unit 3

UCS Letter to NRC Regional Administrator, January 6, 1998

Key Point: Millstone Units 1, 2 & 3, Salem Units 1 & 2, and Maine Yankee began 1997 shut down while safety problems are repaired. Does the NRC consider the safety margins at these plants to be adequate? If yes, why must they be shut down for so long? If not, why were they operating for so long with these problems?

Donald C. Cook Units 1&2

UCS Petition, October 9, 1997 (without its attachments)

Key Point: An NRC inspection team looked at two (2) safety systems and found problems which prompted an immediate shut down of both units. UCS examined the record and discovered that the plant's owners had recently reviewed both of these systems and found no serious problems. Since the owner's review process was clearly flawed, what assurance is there that the other 60-plus safety systems do not have problems like those identified by NRC?

UCS Petition Supplement, January 12, 1998

Key Point: The restart of D C Cook (then pending) is premature because several safety questions have not been answered.

NRC Oversight

UCS Letter to Senate Appropriations Committee, June 24, 1998 (without its attachments)

Key Point: NRC may be guilty of over-regulation at times, but it is also guilty of under-regulation. The reason is the same the NRC lacks objective criteria when it evaluates licensee performance.

UCS Handout at NRC Commissioners Meeting with Stakeholders, July 17, 1998

Key Point: NRC requires its licensees to meet high management standards, yet it frequently fails to meet these same standards. If the NRC met these same standards, many of its problems would disappear.

UCS Letter to NRC Commissioners, July 20, 1998

Key Point: The industry's push for risk-informed regulation must be countered by the ample evidence that many nuclear plants have operated well outside the bounds of their recent risk assessments. Thus, NRC cannot rely on risk assessments which are mathematically correct but which do not reflect reality.

January 6, 1997

HUBERT J. MILLER
Regional Administrator, Region I
United States Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, PA 19406-1415

Subject: Reactor Safety Questions

DEAR MR. MILLER: Region I entered 1997 with seven nuclear units shut down due to reactor safety concerns: the three Millstone units, the two Salem units, and Maine Yankee. R. G. Brown & Associates, Inc., a financial consulting firm hired by the State of Connecticut's Department of Utility Control, recently concluded that Northeast Utilities "lost focus on the safe operation" of Millstone and placed "primary importance on financial issues." In 1988, the Nuclear Business Unit at Public Service Electric & Gas revised its mission statement for the Salem and Hope Creek plants from "World Class by 1995" to one placing greater emphasis on economic performance. Consequently, the Salem and Hope Creek plants experienced significant regulatory and performance difficulties by 1995. More recently, the NRC found that Maine Yankee's problems were caused by that utility's economic pressures. Clearly, economics played a significant role in the poor safety performance at these troubled nuclear plants.

In order to better understand the NRC's criteria for assessing reactor safety, please address the following question:

(1) Does the NRC consider the three Millstone units, the two Salem units, and Maine Yankee safe enough to allow these plants to restart today?

Depending on the answer to the question above, please address the applicable following question:

(2) If these plants are not safe enough to operate today, does the NRC think that these plants were operating safely in the days and weeks prior to their being shut down?

If the safety margins at these plants are not sufficient to allow them to restart, it seems evident that these plants operated with inadequate safety margins prior to being closed. This determination would raise serious doubts about the NRC's ability to protect public health and safety following restart of these troubled plants as well as during operation of other seemingly untroubled plants.

(3) If these plants are safe enough to operate today, does the NRC have the right to conduct additional inspections and impose additional requirements for these troubled plants that prolong the duration, and significantly increase the costs, of their outages?

If these plants had adequate safety margins prior to being closed and those safety margins have not been eroded while the plants have been idled, it seems evident that the NRC may be unduly harming the communities around these plants (as well as the ratepayers and stockholders of these utilities) by taking actions that prolong the outages and further weaken the economic viability of these plants. If these plants are safe enough to operate today, it seems obvious that their generating revenues would only enhance the ability of these utilities to maintain the necessary safety margins.

I respectfully request your response to these questions prior to the restart of any unit at Millstone, Salem, and Maine Yankee.

Sincerely,

DAVID A. LOCHBAUM,
Nuclear Safety Engineer

UNION OF CONCERNED SCIENTISTS
Washington, DC 20548 October 9, 1997.

L. JOSEPH CALLAN,
Executive Director for Operations,
Nuclear Regulatory Commission,
Washington, DC 20555-0001

Subject: Petition Pursuant to 10 CFR 2.206, Donald C. Cook Nuclear Plants Units 1 AND 2, Docket Nos. 50-315 and 50-316

DEAR MR. CALLAN: The Union of Concerned Scientists submits this petition pursuant to 10 CFR 2.206 requesting that the operating licenses for Donald C. Cook Units 1 and 2 be modified, revoked, or suspended until there is reasonable assurance that their systems are in conformance with design and licensing bases requirements. A process comparable to the system certifications recently used by the Salem and Millstone licensees would provide this necessary level of assurance. UCS additionally requests that a public hearing into this matter be held in the Washington, DC area prior to the first unit at D C Cook being authorized to restart. At this hearing, we will present information supporting the contentions in this petition.

Background

On October 9, 1996, the NRC requested that its power reactor licensees provide information pursuant to 10 CFR 50.54(f) regarding the adequacy and availability of design bases information. The NRC's issued this request as a result of its investigations at the Millstone Power Station. The licensee for the D C Cook plant responded with a letter dated February 6, 1997, describing the administrative controls it uses to provide assurance that the Cook Nuclear Plant is operated and maintained within the established design bases.

An NRC team recently conducted an architect/engineer design inspection at D C Cook. According to the NRC's Project Manager for D C Cook, this NRC team examined two safety systems and their supporting systems. The team's findings forced the licensee to shut down both units on September 10, 1997.

The NRC issued a confirmatory action letter to the licensee dated September 19, 1997, specifying issues arising from the design inspection that must be resolved prior to restarting the units. These issues (listed in Attachment 1) include physical modifications to the plants and revisions to the plants' operating licenses. Numerous NRC Daily Event Reports (listed in Attachment 2) described the findings from design inspection as reported by the licensee. The NRC has not yet released the design inspection report and we have been told that it will not be issued until next week at the earliest.

Basis for Requested Action

The NRC conducted architect/engineer design inspections at only six of its nearly 70 operating power reactor licensee sites. These design inspections examined only one or two safety systems along with their supporting systems at each site. The NRC Project Manager reported that the design inspection at D C Cook examined the residual heat removal and component cooling water systems along with their supporting systems. These design inspections focused on the facilities' original design and the licensees' conformance with the safety analysis reports.

The systems examined by the NRC at D C Cook had already been covered by the licensee's design basis documentation reconstitution program. Design basis documents (DBDs) for the containment, containment structure, containment spray, emergency core cooling, component cooling water, and residual heat removal systems had been approved by the licensee prior to the NRC team's arrival. The licensee informed the NRC that its DBD program had not identified any deficiencies involving equipment operability.

The findings by the NRC design inspection team prompted the licensee to declare both trains of the emergency core cooling systems and the containment spray system inoperable. The units were shut down on September 8 and 9, 1997. The licensee reported making physical changes to the plant to correct some of the problems and indicated that additional physical changes may be required.

The licensee has proposed fixing the specific operability issues identified during the NRC design inspection and then restarting the units. Confining the scope of the restart activities in this way would be treating the symptoms rather than the cause of the problems. The NRC design inspection revealed serious deficiencies in the licensee's design control programs. These deficiencies created the specific problems that forced the plants to be shut down. These deficiencies may also be responsible for similar problems in other safety systems which were not examined by the NRC.

It is important to note that the NRC identified significant operability problems in systems that the licensee had covered in recently approved DBDs. The licensee stated in its February 6, 1997, submittal that it verifies and validates the information in its DBDs via reviews and physical plant walkdowns prior to their approval. Thus, the NRC discovered significant problems in systems which had been closely scrutinized by the licensee. Had the NRC's findings involved systems which have not yet been covered under the licensees' DBD program, it might be reasonable to assume that the licensee would have identified them at that later date. However,

there is little reason to believe that these problems would have been resolved unless the NRC had identified them.

Attachment 2 lists NRC Daily Event Reports (DERs) involving issues identified by the NRC design inspection at D C Cook. DER Nos. 32740, 32806, 32822, 32839, 32843, 32875, 32890, 32904, 32914, 32915, 32921, 32948, and 32988 describe potential deficiencies that appear to have existed at D C Cook prior to the initiation of its design basis documentation reconstitution effort in 1992. That effort was therefore apparently unable to detect these potential deficiencies. DER Nos. 32823, 32824, 32903, 32939, and 32948 describe potential deficiencies that appear to have been introduced since 1992. Thus, the licensee's design control and quality assurance programs are apparently unable to ensure that the facility is maintained within its design bases.

UCS feels that the design basis documentation reconstitution and Updated Final Safety Analysis Report (UFSAR) validation programs as described in the licensee's response to the NRC's 50.54(f) letter lack the rigor and focus necessary to identify potential design-related operability issues. Our conviction is supported by the findings from the NRC design inspection. Since the corrections to the NRC's findings were not limited to mere paperwork fixes but included actual changes to the plant's physical configuration, the safety significance of these and potentially other undetected problems cannot be understated.

The flaws in the licensee's design control programs must be corrected. The systems at D C Cook, at least those with a safety function, must be certified to be capable of performing their required actions under all design conditions. Then, and only then, can the units be restarted with reasonable assurance that public safety will be adequately protected. It would be irresponsible to restart these units knowing that the programmatic failures that caused the safety problems identified by the NRC team may have produced comparable problems affecting the operability of other safety systems.

The legal precedent for our position is stated by the NRC's Atomic Safety and Licensing Appeal Board in the Matter of Vermont Yankee Nuclear Power Corporation, Memorandum and Order (ALAB-138), dated July 31, 1973:

"As a general rule, the Commission's regulations preclude a challenge to applicable regulations in an individual licensing proceeding. 10 CFR 2.758. This rule has been frequently applied in such proceedings to preclude challenges by intervenors to Commission regulations. Generally, then, an intervenor cannot validly argue on safety grounds that a reactor which meets applicable standards should not be licensed. By the same token, neither the applicant nor the staff should be permitted to challenge applicable regulations, either directly or indirectly. Thus, those parties should not generally be permitted to seek or justify the licensing of a reactor which does not comply with applicable standards. Nor can they avoid compliance by arguing that, although an applicable regulation is not met, the public health and safety will still be protected. For, once a regulation is adopted, the standards it embodies represent the Commission's definition of what is required to protect the public health and safety." [emphasis added]

"In short, in order for a facility to be licensed to operate, the applicant must establish that the facility complies with all applicable regulations. If the facility does not comply, or if there has been no showing that it does comply, it may not be licensed." [emphasis added]

The NRC design inspection at D C Cook identified significant issues which caused both units to be shut down. These issues were caused by programmatic deficiencies in the licensee's design control programs. A contributing factor for these issues is the failure of the licensee's quality assurance and self-assessment programs to detect these problems. Nothing in the reported findings from the design inspection supports a conclusion that these findings are isolated consequences. The NRC's design inspection invalidates any showing that this facility complies with all applicable regulations. Therefore, the design control deficiencies must be corrected to prevent future non-compliances with safety regulations. And just as importantly, a thorough review of all systems with safety functions must be completed prior to restart to detect and correct past non-compliances.

UCS is not advocating that the NRC apply a higher standard at D C Cook. Instead, we are requesting that the NRC ensure that the D C Cook facility is in accordance with the minimum safety standards which constitute the legal grounds for allowing the units to operate. Our request is consistent with the measures required by the NRC when other sampling inspections find problems. We ask the NRC to expand the inspection scope based upon the identified problems just as would be required when snubber (e.g., pipe restraint) and reactor vessel internals inspections found problems.

Requested Actions

UCS petitions the NRC to protect public health and safety by preventing the units at D C Cook from operating until such time that there is reasonable assurance that all significant non-compliances have been identified and corrected. The system certification process recently used at the Salem Generating Station and the Millstone Power Station would provide such reasonable assurance. We request a public hearing on this matter be held in the Washington, DC area before any unit at D C Cook is authorized to restart.

Sincerely,

DAVID A. LOCHBAUM,
Nuclear Safety Engineer.

ATTACHMENTS:

- 1) Design Inspection Issues That Will Be Resolved Prior to D C Cook Restart
- 2) NRC Daily Event Reports on D C Cook Design Inspection Findings

Attachment 1

Design Inspection Issues That Will Be Resolved Prior to DC Cook Restart

The following issues, quoted verbatim, were specified on the NRC's Confirmatory Action Letter dated September 19, 1997, as requiring resolution prior to restart of any D C Cook unit:

1. Recirculation Sump Inventory/Containment Dead Ended Compartments Issue
Analyses will be performed to demonstrate that the recirculation sump level is adequate to prevent vortexing, or appropriate modifications will be made. [See also Attachment 2—Power Reactor Event Number 32890]

2. Recirculation Sump Venting Issue

Venting will be re-installed in the recirculation sump cover. The design will incorporate foreign material exclusion requirements for the sump. [See also Attachment 2 Power Reactor Event Numbers 32875 and 32903]

3. Thirty-six Hour Cooldown, with One Train of Cooling

Analyses will be performed that will demonstrate the capability to cool down the units consistent with design basis requirements and necessary changes to procedures will be completed.

4. ES-1.3 (Switchover to Recirculation Sump) Procedure

Changes to the emergency procedure used for switchover of the emergency core cooling and containment spray pumps to the recirculation sump will be implemented. These changes will provide assurance there will be adequate sump volume, with proper consideration of instrument bias and single failure criteria. [See also Att. 2 Power Reactor Event Numbers 32806 and 32904]

5. Compressed Air Overpressure Issue

Overpressure protection will be provided downstream of the 20 psig, 50 psig, and 85 psig control air regulators to mitigate the effects of a postulated failed regulator. [See also Attachment 2 Power Reactor Event Numbers 32939 and 32988]

6. Residual Heat Removal (RHR) Suction Valve Interlock Issue

A technical specification change to allow operation in mode 4 with the RHR suction valves open and power removed is being processed. Approval of this change by the NRC will be required prior to restart. [See also Attachment 2 Power Reactor Event Numbers 32914 and 32921]

7. Fibrous Material in Containment

Removal of fibrous material from containment that could clog the recirculation sump will be completed. [See also Attachment 2 Power Reactor Event Number 32948]

Attachment 2

NRC Daily Event Reports on D C Cook Design Inspection Findings

The following summaries were taken from the daily event reports available on the NRC's website (www.nrc.gov). The only editing involved deletion of unnecessary detail, such as who was notified about the events, and the addition of clarification for acronyms. Otherwise, these narratives are verbatim.

POWER REACTOR EVENT NUMBER: 32890 UNUSUAL EVENT DECLARED & TECHNICAL SPECIFICATION REQUIRED SHUTDOWN ON BOTH UNITS DUE TO INOPERABLE CONTAINMENTS

As a result of issues raised during the ongoing architect/engineer design inspection, the licensee was reviewing the design aspects of the containments (both units have similar containments). After consulting with the nuclear steam supply system supplier (Westinghouse) the licensee determined that concerns existed about wheth-

er adequate communication (flow paths) exists between the active and inactive portions of the containment sump.

During certain scenarios, the volume of water flow back to the containment recirculation sump may not be adequate to support long-term emergency core cooling (ECC) systems (RHR [residual heat removal] system, safety injection system, charging system) or containment spray pump operation during the recirculation phase of a large or small break LOCA. The containment drainage system is designed to ensure that water entering the containment from the breach in the reactor coolant system, ECC systems injection, and ice condenser melt flows back into the containment recirculation sump via drains. Licensee analysis was unable to confirm that sufficient communication existed between inactive and active volumes of the containment to ensure adequate drainage to the recirculation sump. Without adequate drainage into the sump, a low sump level will result, which jeopardizes long term operation of the ECC Systems and containment spray pumps due to vortexing and air entrainment.

As a conservative measure because of these concerns, the licensee declared both trains of the ECC Systems and the containment spray system inoperable for both units and entered Technical Specification limiting condition for operation action statement 3.0.3 to shut down both units. The licensee commenced shutting Unit 1 down from 100 percent power at 1655 and Unit 2 down from 100 percent power at 1728. At 2000, the licensee declared an unusual event on both units due to the potential loss of containment barrier on both units.

The licensee plans to perform further analysis to determine the extent of the existing communication between the portions of the sumps and whether plant modifications will be necessary.

The unusual event was terminated and exited at 0303 EDT when Unit 1 entered mode 5 (cold shutdown). Unit 2 entered mode 5 at 0015 EDT (cold shutdown).

POWER REACTOR EVENT NUMBER: 32875

FAILURE TO MAINTAIN THE CONTAINMENT RECIRCULATION SUMP 1/4" PARTICULATE RETENTION REQUIREMENT (HISTORICAL ISSUE)

A 1/4" particulate retention requirement for the containment recirculation sump was not properly established in 1979 following sump modifications. The containment recirculation sump requirement to retain 1/4" particles is to ensure that containment spray nozzles do not become plugged. The containment spray system takes suction from the containment recirculation sump following injection of the refueling water storage tank supply during a loss of coolant accident.

In 1979, modifications were performed on the containment recirculation sump. One of the modifications involved moving a 1/4" retention element from inside the recirculation sump to the entrance of the sump. When the retention element was moved, the 1/4" retention requirement was not fully addressed, and pathways exceeding the 1/4" requirement were inadvertently established. The inadvertent pathways established included: 3/4" vents in the roof of the recirculation sump entrance, the containment sump drain line from the recirculation sump, and small gaps around the sump entrance. These pathways have since been eliminated or the 1/4" requirement has been established.

The licensee is reporting the fact that since 1979 until the 1/4" requirement was established or the pathway was eliminated, the containment recirculation sump did not meet its design requirement.

The containment recirculation sump currently meets the 1/4" requirement. A condition report has been written to initiate investigation into this event and determine appropriate preventive actions.

This event was determined to be reportable at 0856 on September 5, 1997.

*** Update at 1905 on 09/10/97 by Randy Ptacek entered by Jolliffe ***

After further review of the above condition, the licensee concluded that the emergency core cooling (ECC) system was outside its design basis as a result of the 1/4" requirement not being met following the 1979 plant modifications. By not adequately covering the 1/4" particulate retention requirement, larger particles had the potential to enter the recirculation sump. The ECC System has not been analyzed for these larger particles nor is it within the design of the ECC System to handle these larger particles.

The licensee has concluded that this event is also reportable to the NRC in accordance with the requirements of 10 CFR 50.72(b)(1)(ii)(a) unanalyzed condition, and 10CFR50.72(b)(2)(iii)(d) accident mitigation.

POWER REACTOR EVENT NUMBER: 32903

CONTAINMENT RECIRCULATION SUMP VENT HOLES HAVE BEEN FILLED WITH CONCRETE

As a result of questions posed by the NRC architect/engineer design inspection team, the licensee determined that the inlet venting requirement for the containment recirculation sumps was not properly maintained following modifications to the Unit 2 sump in 1996 and the Unit 1 sump in 1997 (both units have similar containments).

The containment recirculation sump venting requirement was established in 1979 as part of the original sump design to reduce the potential for air entrainment through the sump. The venting requirement was met through the addition of 5 $\frac{3}{4}$ -inch diameter holes drilled in the roof of the sump inlet. (The holes did not meet the $\frac{1}{4}$ -inch diameter requirement as reported in Event #32875.) When these holes were discovered during the Unit 2 1996 refueling outage and the Unit 1 1997 refueling outage, they were classified as abandoned equipment holes that exceeded the $\frac{1}{4}$ -inch particulate retention requirement for the sumps and they were filled with concrete.

POWER REACTOR EVENT NUMBER: 32806

INSTRUMENTATION INDICATIONS USED TO DETERMINE WHEN REFUELING WATER STORAGE TANK TO CONTAINMENT SWITCHOVER IS REQUIRED MAY NOT HAVE BEEN CORRECT TO PREVENT VORTEXING IN THE CONTAINMENT RECIRCULATION SUMP.

During the evaluation of a proposed procedure change that affects switchover from the refueling water storage tank (RWST) to the containment sump during a loss-of-coolant accident (LOCA), it was determined that the instrumentation indications used to determine when the switchover is required may not have been correct to prevent vortexing in the containment recirculation sump.

To address this situation, procedures associated with the switchover (on both units) have been conservatively changed to accommodate the related instrument inaccuracies. These changes assure adequate RWST water is in containment before switchover to eliminate concerns that vortexing would occur in the containment sump after switchover.

The problem is that the RWST water level indicators are connected to the suction line that goes to the residual heat removal (RHR) pumps. Due to the flow in these lines, the indicated water level at which the switchover would be initiated would be less than the actual water level of the RWST (the licensee would be putting less water into the containment than expected). Also, the licensee said that they had some inaccuracies associated with their containment sump instrumentation. The licensee adjusted the containment sump indication to assure that they have an adequate volume in the containment to prevent vortexing. The licensee relies upon two indications for switchover; RWST water level and containment water level.

POWER REACTOR EVENT NUMBER: 32904

SINGLE FAILURE DURING RECIRC SUMP SWITCHOVER COULD BE UNANALYZED CONDITION

As a result of questions posed by the NRC architect/engineer design inspection team, the licensee determined that the possibility of a single failure during an accident while performing switchover of the emergency core cooling system pumps from the refueling water storage tank (RWST) suction to the recirculation sump suction could have resulted in the plant being in an unanalyzed condition. This condition is outside the plant design basis, and it potentially could have prevented the fulfillment of a safety function of structures or systems.

The plant emergency operating procedures (EOPs) as currently written require that the west residual heat removal (RHR) pump be the first pump switched from the RWST suction to the recirc sump suction. Once this is accomplished, the centrifugal charging (CC) pumps' suction and the safety injection (SI) pumps' suction are then swapped from the RWST supply to the discharge of the west RHR pump. If the west RHR pump were to fail at this point when all CC and SI pumps were being supplied from its discharge, prior to the east RHR pump suction being transferred from the RWST to the recirc sump, all CC and SI pumps could also fail due to the loss of suction flow. This would result in the loss of all high and medium head injection with only the flow from the east RHR pump available for injection into the reactor coolant system. The licensee is currently reviewing the EOPs to determine an alternate switchover sequence that would eliminate the condition as described above.

POWER REACTOR EVENT NUMBER: 32939

INSTALLED PLANT MODIFICATION INTRODUCED THE POSSIBILITY OF A SINGLE FAILURE WHICH COULD RESULT IN THE LOSS OF BOTH TRAINS OF THE ESF VENTILATION SYSTEM.

At 1620 on 09/16/97, the licensee determined that a plant modification installed between December 1996 and August 1997 introduced the possibility of a single failure which could result in the loss of both trains of the engineered safety features (ESF) ventilation system if the 85-psi air header was to be lost. Prior to the installation of the plant modification, the ESF ventilation system charcoal inlet and bypass dampers both utilized a 20-psi air header and were positioned such that the charcoal bypass dampers were normally open and would fail closed; and the charcoal inlet dampers were normally closed and would fail open. The plant modification installed new bypass dampers which required higher air pressure to operate and were, therefore, transferred to the 85-psi header. If the 85-psi air header was lost, it would result in the repositioning of the normally open bypass dampers without the opening of the charcoal inlet dampers on both trains. This would result in dead heading of the filter train fans and loss of cooling to emergency core cooling system (ECCS) equipment.

POWER REACTOR EVENT NUMBER: 32988

NON-SAFETY RELATED AIR HEADERS LACK OVERPRESSURE PROTECTION

During an architectural engineering inspection a question was raised regarding the lack of overpressure protection on the 20, 50 and 85 psig control air headers. The specific concern is the potential for common mode failure of both trains of safety related equipment served by the air headers. The overpressure condition is postulated to be caused by regulator failure.

Although system reviews have found no component failure mode which would result in the devices being incapable of going to their fail-safe position, a design change package has been prepared to provide overpressure protection on the 20, 50 and 85 psig headers.

POWER REACTOR EVENT NUMBER: 32914

LICENSEE IDENTIFIED THAT BOTH UNITS HAD OPERATED THEIR RHR SYSTEM CONTRARY TO THE DESCRIPTION IN THE FSAR.

At 1615 EDT, with Units 1 and 2 shutdown in mode 5, it was determined that both units have operated contrary to the design basis for the residual heat removal (RHR) system as described in the Final Safety Analysis report (FSAR). FSAR Chapter 9, Section 9.3, describes the interlocks associated with the residual heat removal (RHR) suction valves from the reactor coolant system (RCS). The suction line valves are interlocked through separate channels of the RCS system pressure signals to provide automatic closure of both valves whenever RCS pressure exceeds RHR design pressure. The FSAR states that the interlock may be defeated when the RCS is open to atmosphere. However, for a number of years this interlock has been procedurally defeated on both units to prevent inadvertent closure and loss of RHR suction during shutdown cooling operation by opening the valves and racking out their breakers in mode 4.

The overpressure protection afforded by the automatic closure function described in the FSAR was defeated without a safety evaluation being performed. This loss of automatic closure function represents an unanalyzed condition and is, therefore, reportable.

Plans are to degas, depressurize, and open the RCS on both units to atmosphere. Degas will start on Unit 1, and when completed, the unit will proceed to depressurize while Unit 2 starts degas procedures. When the RCS is open to atmosphere on both units, the plant will be in compliance with the FSAR.

This condition was identified by the licensee during an ongoing NRC architect/engineer inspection.

*** Update at 2130 EDT on 9/13/97 from Robert Blyth to S. Sandin ***

The licensee has completed its safety evaluation for mode 5 operation and concluded that there was no unreviewed safety question or change of operation as described in the FSAR. Consequently, degas of Unit 1 has been terminated, and neither unit will be vented to atmosphere.

POWER REACTOR EVENT NUMBER: 32921

THE LICENSEE IDENTIFIED THAT BOTH RHR PUMPS HAD BEEN OPERATED WHEN THE RCS WAS DEPRESSURIZED, WHICH IS CONTRARY TO THE DESCRIPTION IN THE FSAR.

Chapter 9 of the Final Safety Analysis Report (FSAR) states: 'Only one residual heat removal (RHR) pump will be operated when the reactor coolant system is open to atmosphere to prevent damaging both pumps in the unlikely event that suction should be lost.' Operating procedures for the RHR system do not prevent operation of both RHR pumps when the reactor coolant system (RCS) is open to atmosphere, and in the past, both RHR pumps have been run when the RCS was vented to atmosphere.

Plant operating procedures are being reviewed to determine the impact. Procedure changes will be implemented as necessary to address the FSAR requirement. A condition report has been initiated to investigate and determine appropriate preventative actions.

POWER REACTOR EVENT NUMBER: 32948

IT WAS DETERMINED THAT FIBROUS MATERIAL IS PRESENT IN BOTH UNIT 1 AND UNIT 2 CONTAINMENT IN ENOUGH QUANTITY TO POTENTIALLY CAUSE EXCESSIVE BLOCKAGE OF THE CONTAINMENT RECIRCULATION SUMP SCREEN DURING THE RECIRCULATION PHASE OF A LOSS OF COOLANT ACCIDENT.

In 1985, 1986, and 1995 "Fiberfrax" refractory insulation materials in bulk, blanket or board form were used as damming material when installing fire stops in cable trays in both containments. The specification governing installation of the fire stops did not require removal of the material, only stating that it should be removed "if necessary." The material was not removed. The material is present in 12 cable trays in Unit 1 and 15 cable trays in Unit 2.

When the Fiberfrax is exposed to water or steam/water environment it could potentially break into small pieces, which could be transported to the recirculation sump by the water flow in containment during a loss of coolant accident. Once it reaches the recirculation sump it has the potential to clog the screens in excess of the design value. Excessive screen blockage could result in ECCS inoperability during the recirculation mode.

The Fiberfrax material is currently being removed from the containments, and removal will be completed prior to restart of the units. The possibility that the licensee's work control process allowed unencapsulated fibrous material to be installed in other locations inside containment is being investigated.

POWER REACTOR EVENT NUMBER: 32740

UNITS 1 & 2 OPERATED OUTSIDE THE DESIGN BASIS FOR SERVICE WATER INLET TEMP

As a result of questions posed by members of the ongoing NRC design inspection team, the licensee has determined that Units 1 & 2 have operated outside the plant design basis for service water inlet temperature.

The Updated Final Safety Analysis Report (UFSAR), Table 9.5-3, lists service water inlet temperature design value as 76 degrees F. This value is used as input to analyses such as containment peak pressure and control room habitability. Although engineering analyses were performed in 1988 raising the temperature to 87.5 degrees F as listed in the plant Technical Specifications, a 10 CFR 50.59 safety evaluation was never performed, nor was the UFSAR properly revised.

Plant service water inlet temperature is the same as Lake Michigan water temperature. A review of historical data indicates that during July and August of any year, Lake Michigan water temperature is likely to exceed the 76 degrees F value. Specific data for 1997 shows that Lake Michigan water temperature, and therefore plant service water inlet temperature, was greater than 76 degrees F on July 17, July 18, and August 4, 1997. All plant systems which utilize service water as a cooling medium have been determined to be operable. A 10 CFR 50.59 safety evaluation will be performed and appropriate changes will be incorporated into the UFSAR.

This report is intended to cover any temperature exclusions above 76 degrees F and below the 87.5 degrees F value listed in the plant Technical Specifications that may occur prior to the completion of the 10 CFR 50.59 safety evaluation.

POWER REACTOR EVENT NUMBER: 32822

DISCOVERY THAT A NORMAL OPERATING PROCEDURE ALLOWED PLANT OPERATION WITH COMPONENT COOLING WATER HEAT EXCHANGER OUTLET TEMPERATURES GREATER THAN THE DESIGN LIMIT SPECIFIED IN THE FINAL SAFETY ANALYSIS REPORT

During the ongoing NRC architect/engineer design inspection, a question was asked relative to a statement used in the normal operating procedure for the component cooling water (CCW) system. The statement allows for a heat exchanger outlet temperature for CCW to reach 120 degrees F for a period of 3 hours during normal cooldown on the residual heat removal system. Investigation revealed that this statement was in the original issue of the procedure in 1976. However, no 10 CFR 50.59 unreviewed safety evaluation determination documentation could be found to support this design parameter.

The licensee's Final Safety Analysis Report (FSAR) states that the CCW heat exchanger outlet design temperature is 95 degrees F. Based on the FSAR requiring the 95 degrees F outlet temperature and the lack of an unreviewed safety question determination to justify operation exceeding 95 degrees F, the units were in a condition that allowed operation outside the design basis because the procedure allowed operation up to 120 degrees F for a period of 3 hours during normal cooldown on the residual heat removal system. The units are not currently in a Technical Specification limiting condition for operation as a result of this issue.

Procedure changes have been made to remove the inappropriate statement. A condition report has also been written to initiate an investigation into this event and determine appropriate preventive actions.

POWER REACTOR EVENT NUMBER: 32823

FAILURE OF A SAFETY REVIEW TO ADDRESS FINAL SAFETY ANALYSIS ATTRIBUTES ON ASSOCIATED COMPONENT COOLING WATER COOLING REQUIREMENTS

During the ongoing NRC architect/engineer design inspection, a question was asked relative to dual train component cooling water (CCW) system outages. During dual train CCW outages, CCW cooling is supplied to the spent fuel pool (SFP) heat exchanger only from the opposite unit. If that unit has a loss of coolant accident (LOCA), CCW to the SFP heat exchanger will isolate. Final Safety Analysis Report (FSAR) Table 9.5-2, footnote 3, indicates that the SFP heat exchanger is assumed to be on the non-accident unit.

The licensee reported the following inspection questions:

1) Does a dual train CCW outage represent a condition outside the plant design basis?

2) Was this reviewed as part of the process of allowing a dual train CCW outage?

Based on a review of FSAR Table 9.5-2, it was concluded that footnote 3 was established to clarify why no values for SFP heat exchanger flow for the unit undergoing the LOCA are listed in the table. Footnote 3 reflects normal SFP cooling system design and operation.

A review was performed of the safety evaluation performed for the Unit 2 full core offload with one train of spent fuel cooling. This safety review covered the Unit 2 refueling outage schedule which included a dual train CCW outage.

Footnote 3 of Table 9.5-2 represents the normal design of the SFP cooling system, that is, the SFP cooling system is designed to remove the heat generated by stored spent fuel elements in the [SFP]. The system incorporates two separate trains.

The safety review for the Unit 2 full core offload with one train of spent fuel cooling addressed the FSAR section 9.4 attribute of the SFP cooling dealing with time to boil events and bulk pool temperature requirements; however, the safety review failed to address FSAR section 9.5 attributes associated CCW cooling requirements as given in Table 9.5-2.

This issue impacts both units. However, the units are not currently in a Technical Specification limiting condition for operation as a result of this issue.

POWER REACTOR EVENT NUMBER: 32824

FAILURE TO PERFORM A 10-CFR 50.59 EVALUATION FOR A PROCEDURE CHANGE INVOLVING COMPONENT COOLING WATER HEAT EXCHANGER OUTLET TEMPERATURE LIMITS

During the ongoing NRC architect/engineer design inspection, a question was asked relative to the fact that during the last Unit 2 refueling outage, an administrative limit of 90 degrees F was placed on the component cooling water (CCW) system. The thermal analysis indicated that a maximum CCW temperature of 90 de-

degrees F would eliminate all margin associated with the spent fuel pool (SFP) design assuming a design flow of 3,000 gpm.

The following inspection question was asked: Since a change in CCW temperature was required to meet the Final Safety Analysis Report (FSAR) value of 160 degrees F for the SFP, was a 10 CFR 50.59 unreviewed safety evaluation performed?

The licensee reviewed the change to the procedure to limit CCW temperature to 90 degrees F. The licensee considered this change to be an administrative change only to lower the allowable temperature to the SFP cooling heat exchanger. A 10-CFR 50.59 evaluation was not performed because it was not recognized that the 95 degrees F requirement was essentially being changed.

Without the completion of an unreviewed safety question determination, the plant was in a condition outside the design basis. The units are not currently in a technical specification limiting condition for operation as a result of this issue.

A condition report has been written to initiate actions to investigate this event and provide preventive actions. The 90 degrees F limit is no longer in the operating procedures.

POWER REACTOR EVENT NUMBER: 32839

AVAILABLE WATER VOLUME IN RWST NOT ADEQUATE IN MODES 5 AND 6

During the ongoing NRC architect/engineer design inspection, NRC inspectors asked a question about the reactor coolant makeup required after a 10 CFR 50, Appendix R fire. To respond to the question, the licensee reviewed two associated design calculations. The more restrictive calculation was determined to be the calculation of record to meet the requirement. This calculation requires 87,000 gallons of water to be available in the refueling water storage tank (RWST). The value of 87,000 gallons was approved on 02/20/90. During modes 1 through 4, plant procedures adequately ensure that this requirement is met. During modes 5 and 6, plant procedures are not adequate to ensure that this requirement is met.

The plant has been in modes 5 and 6 many times since this requirement became effective on 02/20/90. Based on this, the plant has been in an unanalyzed condition several times since 02/20/90.

Currently both units are in mode 1. The licensee is reviewing plant operating procedures to determine impact and will implement procedure changes as needed prior to either unit entering modes 5 or 6. The licensee is continuing to evaluate the subject calculations and plans to submit a licensee event report to the NRC on this subject.

POWER REACTOR EVENT NUMBER: 32843

LAKE MICHIGAN TEMPERATURE EXCEEDED PLANT DESIGN BASIS LIMIT IN AUGUST 1988

As a result of questions posed by members of the ongoing NRC architect/engineer design inspection team, the licensee has determined that the water temperature of Lake Michigan, the plant's ultimate heat sink, exceeded the plant design basis lake temperature limit of 76 degrees F for 22 days during August 1988.

The control room is normally cooled by an air conditioning system which utilizes non-safety related chillers. The safety related portion of the control room air conditioning system utilizes water from Lake Michigan as the cooling medium. This water would be supplied directly to the cooling coils following manual realignment. At an average lake temperature of 81 degrees F that existed during the 22 day period in August 1988, the temperature inside the control room could have reached 110.4 degrees F had the non-safety related chillers not functioned. At a temperature of 110.4 degrees F, the lifetime of some instrumentation inside the control room, the solid state protection system, and the nuclear instrumentation, is estimated to be at 150 hours or 6.25 days. The impact of this shortened instrument life span on plant operation had not been evaluated.

At the time of this event, the plant Technical Specifications allowed continuous operation with control room temperatures up to 120 degrees F. The Technical Specifications have since been revised such that continued operation with control room temperatures in excess of 95 degrees F is not permitted.

Operation of the plant during the time period when lake temperature exceeded the design basis limit, without analysis indicating acceptable control room cooling could be maintained above this temperature limit, and without procedures to alert personnel of the situation, is considered as operation in an unanalyzed condition. The instrumentation was not adversely impacted by the high lake temperatures as the non-safety related chillers continued to function and maintain acceptable control room temperatures.

POWER REACTOR EVENT NUMBER: 32915

OVERPRESSURE PROTECTION OF THE COMPONENT COOLING WATER SYSTEM PIPING NOT
IN ACCORDANCE WITH THE ANSI CODE REQUIREMENTS

Chapter 9.5 of the FSAR states: "The relief valve on the component [cooling water] surge tank is sized to relieve the maximum flow rate of water that would enter the surge tank following a rupture of a reactor coolant thermal barrier cooling coil. The set pressure assures that the design pressure of the component cooling system is not exceeded."

The piping design code at the Cook plant is B31.1. B31.1 states that an intercepting stop valve cannot be located between the source of pressure and the pressure relief device credited for protecting the pipe. In this instance, the pressure source is the ruptured thermal barrier; the pressure relief device is a safety relief valve on the surge tank. Contrary to the code requirement, there are manual valves maintained open between the two. These valves were not controlled in accordance with or exempted from B31.1.

An evaluation is being performed to determine the most effective method of establishing and maintaining the code requirement. A condition report has been written to initiate an investigation into this event and determine the appropriate preventative actions."

This condition was identified in response to an ongoing NRC architect/engineer design inspection.

UNION OF CONCERNED SCIENTISTS,
January 12, 1998

L. JOSEPH CALLAN
*Executive Director for Operations
Nuclear Regulatory Commission
Washington, DC 20555-0001*

*Subject: Addendum to Petition Pursuant to 10 CFR 2.206, Donald C. Cook Nuclear
Plants Units 1 and 2, Docket Nos. 50-315 and 50-316*

DEAR MR. CALLAN: The Union of Concerned Scientists submits this addendum to the petition pursuant to 10 CFR 2.206 we submitted on October 9, 1997 regarding Donald C. Cook Units 1 and 2. This addendum was requested by Ms. Elinor Adensam of your staff following my oral presentation this morning of our safety concerns. Enclosed is the prepared statement which I read during that presentation.

Sincerely,

DAVID A. LOCHBAUM,
Nuclear Safety Engineer.

This is a public meeting, not the public hearing that we requested when we submitted our 2.206 petition over 3 months ago. There have not been many public hearings held for 2.206 petitions. In fact, it is my understanding that I have attended every 2.206 public hearing ever held. One. That public hearing was held on the Millstone petition filed by We The People and Mr. George Galatis. Mr. Galatis was featured on the cover of TIME in March 1996. The first, and only, public hearing for a 2.206 petition was held the following month. Coincidence? I honestly doubt it. But I will get into statistics and how they are used by the NRC later.

You agreed to this meeting to see if I have "new" information about D C Cook. Before I present my information, and I'll leave it to the NRC staff to determine its age, I will briefly discuss some "old" information. You have heard this information before, but maybe not yet in 1998 the 2.206 petition process is seriously and fundamentally broken. It ain't isn't bent, it's broke.

You revised the 2.206 process 3 or 4 years ago and think it is fixed. The process was indeed changed, but it is not fixed. The old 2.206 process was broken. The new 2.206 process is broken. It needs to be fixed, or eliminated.

I suspect that the NRC's difficulty in stemming declining performance by its licensees offers a close parallel with the history of the 2.206 petition process. Your inspectors detect a performance problem at a plant. Its owner implements corrective actions. You conduct a followup inspection. If you find that things are the same, you correctly assume that the problem has not been fixed. If you find that things are different, you assume that the problem has been fixed. However, things can be different but still not fixed. That's your trouble with the 2.206 process and may have been the trouble you had preventing performance declines during the early stages of Salem and Millstone.

UCS submitted its 2.206 petition on October 9, 1997. We asked for two things: specific actions regarding D C Cook and a public hearing to present our concerns. To date, UCS has received one piece of paper from you concerning our petition a letter dated December 9, 1997, acknowledging its receipt. All of the few telephone discussions we've had regarding the petition have been originated by me.

But enough on the 2.206 process. Perhaps too much. Today's meeting is for UCS to convey its concerns regarding D C Cook to you. Normally, I distribute copies of the slides or handouts to accompany my oral remarks. Since I thought, in good faith, that we would be granted a public hearing and assumed that I'd have at least 10 days to prepare for it, and since that did not happen, I am unable to provide any written documentation to you.

There are six concerns that I would like to discuss with you today.

My first concern involves D C Cook's ice condenser containment. The NRC Inspector General's office was informed last summer about alleged problems in the configuration and testing of the ice condenser at Watts Bar. Problems with the bay doors and components of the ice baskets were specifically identified. The allegations also suggested that many of the problems were generic and therefore affected the other ice condenser plants, including D C Cook. Finally, it was alleged that the problems were known, but not properly reported, by the Watts Bar licensee, the D C Cook licensee, the McQuire licensee, and even Westinghouse.

I refer you to Mr. George Mulley in the IG's office for the technical issues. I don't want to compromise IG's investigation, any more than I've already done. But these allegations exist and they may affect D C Cook. You recently issued an amendment to D C Cook's technical specifications involving the amount of ice in the ice condenser. The ice condenser licensing bases were changed, albeit to a limited extent. It provided another opportunity for the licensee to identify and report any ice condenser problems. I did not see any such report. Are the Watts Bar ice condenser problems valid? Do they apply to D C Cook? I can't answer that at this time. Can you?

My second concern involves the licensee's 50.59 safety evaluation process. From the material I've reviewed, it appeared that you felt the licensee's 50.59 safety evaluation process needed improvements. I understand that the licensee made changes to its process. I am concerned that it is not evident that the licensee made any attempt to determine if safety evaluations prepared under the old process led to inappropriate conclusions. In other words, did the bad process cause bad products?

Before joining UCS in 1996, I was a consultant on a UFSAR vertical slice project for Salem Unit 2. We looked at every safety evaluation written for every modification to the systems we examined. Prior to that assignment, I was a consultant on the power update project for Susquehanna. Although that licensee did not have a suspect 50.59 process, the effect of increasing the plant's licensed power level might have invalidated the conclusions from prior safety evaluations. Therefore, we reviewed the summary for every safety evaluation written. Prior to that assignment, I was a consultant on the Browns Ferry Restart Project. TVA did have a configuration management problem. We reviewed every safety evaluation written for every modification to the systems we examined.

So, based on industry experience and common sense, I expected to see at least some screening of safety evaluations written at D C Cook using the bad process. Has an assessment of D C Cook's safety evaluations been performed? If not, could "bad" safety evaluations prepared using the "bad" 50.59 process mean that unidentified safety problems remain at D C Cook?

My third concern involves engineering calculations. From the material I've reviewed, it appears that the quality of the licensee's calculations was suspect. In fact, the licensee's response to the confirmatory action letter (CAL) dated December 2, 1997, stated that a root cause for its problems was that "Some analyses were found to contain errors and incorrect assumptions." The licensee said a peer review process was used to spot check its calculations. According to the licensee's response, a total of 191 calculations were peer reviewed. Sounds like a broad review. But it's not, for the following reason.

171 calculations were reviewed to resolve the concerns you raised during the design inspection. The remaining 20 calculations covered the auxiliary feedwater, component cooling water, chemical volume and control, containment spray, essential service water, residual heat removal, and electrical distribution systems. 20 calculations for 7 safety systems. That's an average of fewer than 3 calculations reviewed per safety system. Even given this tiny sample, the licensee reported that "some administrative and minor technical concerns were identified."

Is the NRC satisfied that a review of merely 20 calculations is an adequate extent of condition assessment? If so, why?

My fourth concern also involves engineering calculations. Between the time we submitted our petition and the time the licensee responded to the CAL, I received allegations involving net positive suction head (NPSH) calculations performed for D C Cook. The individual making the allegations was at D C Cook and told me there were problems with more than one NPSH calculation. The alleged problems involved both "missing" and inaccurate calculations. I do not know which pumps were affected, but it should not be too difficult for you to check. I am unable to check myself since these documents are not publicly available. Do the safety-related pumps at D C Cook have adequate NPSH as shown by quality calculations?

My fifth concern involves the credibility of the licensee's response to your CAL. By letter dated February 6, 1997, the licensee submitted, under oath, its response to the NRC's 50.54(f) request dated October 9, 1996. I think it is fair to state that the licensee, in that response, told you that there were no major problems with the two safety systems you examined in the subsequent design inspection. Each of these safety systems had been the subject of a design bases document recently issued by the licensee. Essentially, the licensee gave both of these safety systems a clean bill of health. Your subsequent design inspection clearly showed otherwise. Both units have been shut down for over 3 months to fix the problems you identified in the allegedly "clean" systems.

Since the shut down, the licensee has expended considerable effort fixing the many problems you identified. Numerous physical plant changes were necessary. However, the licensee has expended less effort examining whether the programmatic problems you found affected other systems as well. The licensee was unable to identify the problems in the two systems you examined during a thorough design bases documentation program. It appears that the licensee applied less effort, per system, on the recent extent of condition assessment than it applied during the design bases document process. Since the larger effort failed, can you be sure that the smaller effort succeeded?

My sixth concern involves the NRC's own inspection process. You came in, looked at two safety systems, and found enough problems to force both units to shut down. The licensee maintains that these problems were confined to these two systems and everything else is well. Sound familiar? In 1996, you examined 4 systems at Maine Yankee and documented over 70 pages of problems. That licensee claimed the problems were limited to just those systems. Last year, you examined 2 systems at Vermont Yankee and found a serious problem affecting 1 system and lesser problems affecting the other. That licensee claimed the problems were limited to just those systems. If these licensees are correct, then you are the best regulator on the planet. You consistently find the needles in the haystacks. You find the only significant system problems that exist at the plants.

Were these licensees correct? I don't know. More importantly, you don't know either. You've never expanded the scope for system sampling inspections. If you had, just once, examined another system or two, then you'd really know whether you found the only problems or not.

You make sure that the licensees fix the problems you find in the few systems. That obviously needs to be done. But much more needs to be done. The true purpose of the your inspection of sample systems is not to ensure the operability of these few systems. Your inspections are intended to assess the licensee's programs and controls for maintaining all safety systems. Your findings tell you something about the material condition of the plant, but they also provide you information on the licensee's general safety management ability. Theoretically, you should not find anything during an inspection. Thus, any finding actually represents two problems: a nonconforming condition as well as a failure of the licensee's Quality Assurance (QA) process. Too often, you allow licensees to simply fix half of the problem the nonconforming condition. For example, when you find a broken widget, you make sure that the licensee changes the widget. You also need to find out why the licensee did not identify the broken widget and if they have any other broken widgets. The licensee's programmatic failures must be fixed. Otherwise, problems in other systems will remain undetected and future problems may be introduced.

What would it take for you to expand the sample size? This may be a rhetorical question since you have never expanded the sample size. It should not be a rhetorical question. You must develop and issue clearly defined criteria on when you will require additional system assessments based on findings from your system inspections.

These are my concerns.

I think UCS asked for very reasonable actions in our petition. The significant problems you found raise valid questions about the other safety systems at D C Cook. To date, I do not think those questions have been adequately answered. It is clearly the licensee's burden to answer these questions. It is your burden not to

permit D C Cook to restart until these questions are answered and the answers indicate the plant will be operated safely.

To be perfectly candid, I never expected our petition to be granted. The NRC's record is such that a public petition has very little chance of being granted. My fall-back position is to monitor daily event reports, LERs, and inspection reports after the plants restart. When I see a significant problem reported that might have been identified and corrected before restart had the NRC granted our petition, you can be sure I'll let you know.

UNION OF CONCERNED SCIENTISTS,
June 24, 1998

THE HONORABLE PETE V. DOMENICI, *Chairman*,
THE HONORABLE HARRY REID, *Ranking Minority Member*
Subcommittee on Energy and Water Development
Committee on Appropriations
United States Senate

DEAR SENATORS: The Nuclear Regulatory Commission (NRC) has the mission of ensuring that the public is adequately protected from the radiation hazards of nuclear power plant operation. We had misgivings about the NRC staffing cuts recently proposed by your subcommittee because we felt they would compromise the agency's ability to carry out its oversight function. The position adopted in the final appropriations language relieved many of our concerns. The NRC's oversight problems identified by the subcommittee warrant further scrutiny. We commend the subcommittee for initiating an inquiry into these important matters.

The final appropriations language contains several examples of alleged NRC over-regulation. We agree that the NRC should avoid regulations or actions which impose unnecessary burdens on nuclear plant owners. Unnecessary actions may divert resources that could be better used to improve safety performance. Thus, we support the initiative undertaken by the subcommittee to examine this issue in the context of an investigation of how the NRC implements its oversight role.

However, the emphasis appears focused solely on potential over-regulation by the NRC. The equally important subject of potential under-regulation should also be considered. For example, we call your attention to the report released in May 1997 by the United States General Accounting Office (GAO) in response to questions from Senators Biden and Lieberman. The GAO concluded that the NRC had waited too long to stem declining safety performance at the Millstone plant, the Cooper nuclear plant in Nebraska, and the Salem nuclear plant in New Jersey. The NRC implemented numerous changes as a result of lessons it learned from Millstone and other facilities. But we are not confident that sufficient progress has been made. For comparison, the NRC ordered Millstone's owners to bring in two independent companies to confirm that the plant's problems had been fully corrected. The NRC has not had comparable appraisals by Congress, or another independent party, to confirm that its own problems have been fully remedied.

We recently released a report called *The Good, The Bad, and The Ugly: A Report on Safety in America's Nuclear Power Industry*. A copy of this report is enclosed. We describe numerous safety problems in this report which we feel fall into the category of under-regulation by the NRC. Please note that most of these safety problems occurred after the GAO's report was released.

We could communicate additional examples of possible under-regulation by the NRC. We feel that it would be more useful at this point to suggest that the fundamental reason for the NRC's possible under-regulation is also responsible for its alleged over-regulation that the NRC lacks objective standards when monitoring safety at nuclear power plants. If our contention is true, then resolution of this root cause will remedy both of the adverse consequences from the NRC's oversight problems.

Lacking objective safety standards, the agency cannot pro-actively check declining safety levels at a plant. As a result, a watershed event or protracted series of troubling incidents must occur before the NRC reacts. Considerable work had to be completed at Millstone, Salem, and Indian Point 3 before the NRC would permit these plants to restart. The volume of these efforts suggests that these plants operated with inadequate safety margins before they were shut down.

We feel that the NRC currently has the means to apply objective safety standards in its oversight of nuclear power plants. We recently presented our recommended approach at a meeting of the American Nuclear Society. A copy of our ANS presentation is enclosed.

The NRC usually considers the safety implications of degraded plant conditions in the wrong context. The NRC only discusses the defense-in-depth elements (i.e., multiple barriers and redundant equipment) within its regulations that provide adequate protection of the public in event of an accident. Degraded plant conditions typically involve more than one non-conformance with the safety regulations. For example, nearly 70 physical changes to Millstone Unit 3 were made during its current outage to restore the facility into compliance with safety regulations. According to the plant's owners, at least 20 problems were corrected that had moderate or high safety risk. The virtues of the regulations are irrelevant when a plant like Millstone is so far out of compliance with them.

The NRC also underestimates the safety implications from degraded plant conditions by independently evaluating each problem. In our view, that approach is non-conservative and improper. By analogy, an individual can generally tolerate a single bee sting with minor health consequences. The effects from 20 to 70 bee stings could be a more serious matter.

We advocate that the NRC evaluate, or require that its licensees evaluate, the safety implications of degraded plant conditions in their proper context. The purpose of this evaluation would be to determine whether the public would have been protected had an accident occurred at the plant in its degraded condition. The NRC should determine if the public would have been protected had Millstone Unit 3 suffered an accident while it operated with so many of its safety systems degraded. Occasionally, results from these determinations may indicate that public safety could have been compromised. Identification of such near-misses is vitally important. First, it significantly reduces the chances that the problem will recur with potentially more tragic consequences. In addition, it prioritizes safety issues into those which must be addressed immediately and those which can wait. This distinction allows resources to be applied properly from both safety and economic perspectives.

We respectfully ask the subcommittee to consider both under-regulation and over-regulation as it examines the NRC's effectiveness. If there's any way that UCS can be of assistance in your efforts, please do not hesitate to contact me.

Sincerely,

DAVID A. LOCHBAUM,
Nuclear Safety Engineer.

Enclosures: 1) UCS Presentation at 1998 ANS Annual Meeting, "Reactor Safety Margins," June 8, 1998

2) The Good, The Bad, and The Ugly: A Report on Safety in America's Nuclear Power Industry, June 1998

COMMENTS AND OBSERVATIONS ON NRC'S REGULATORY STRUCTURE AND PROCESSES

Summary

Nuclear plant performance is a function of management effectiveness more than it is a function of plant age, reactor type, and other factors.

All plants can develop comprehensive corrective action plans. Good management ensures that the plans are implemented properly and revised as necessary such that the desired objectives are obtained. Bad management allows the plan to get waylaid by emerging issues such that schedule or quality, or both, suffer. Good management uses yardsticks to measure the effectiveness of changes, physical or administrative) implemented at their plants. Bad management does not.

Good management establishes objective standards, which are clearly and consistently communicated to plant workers. Bad management sends unclear or mixed messages (i.e., either standards are vague/ill-defined like excellence' or objectives cannot be attained with resources devoted to projects).

Good management establishes clear accountability, or ownership, for issues. Bad management does not, leading to confusion, frustration, ineffectiveness, and delays as things get sorted out.

Good management provides workers with effective procedures and policies such that most items can be processed through normal channels. Bad management does not, which forces the majority of items to be hand-carried through the process.

NRC regulatory performance is a function of management effectiveness more than it is a function of staff size, structure, and other factors. Unfortunately, the NRC staff more closely resembles bad management than good management:

- The NRC staff develops corrective action plans, but fails to adequately monitor them to ensure the stated objectives are obtained (examples: enforcement policy, 2.206 and allegation processes have been revised in recent years, but are no better than they were a decade ago).

- The NRC staff does not consistently enforce criteria whether they are 10 CFR 50 regulations or NRC policies (examples: D C Cook was shut down last September due to LOCA concerns under postulated conditions. Yet suction strainer issues on BWRs, which actually happened and had unusually similar consequences, did not trigger the shut down of any of the affected plants).
- The NRC staff seems to lack clearly defined accountability (example: UCS allegation involving Millstone Unit 3 was purportedly handled by NRR until the week after the restart vote, then it was passed back to Region I).
- The NRC staff suffers from a lack of continuity (example: allegations, 2,206 petitions, and issues raised by UCS get routinely re-assigned from one interim or transient person to another).

Inspection and Enforcement

Inspection program is flawed because inspection reports do not accurately reflect inspection findings.

Examples: Maine Yankee ISAT (10/96), Dresden assessment (late 96)

Inspection program is also flawed because inspection reports are primarily dictated by NRC's general impression of the plant's performance.

Example: D C Cook virtually every inspection report issued since January 1998 has included one or more violations. In the 2-years prior to 1998, fewer than half of the inspection reports contained violation(s). Most of the violations cited in 1998 are not for new problems, but are for longstanding material condition or administrative control problems. The floodgates at D C Cook are now open.

Enforcement process is badly broken because it is inconsistent and untimely.

Examples: By policy, licensees who implement good corrective actions in a timely manner (i.e., do what the law requires) can have their civil penalties totally waived. By practice, licensees who run up a huge tab (e.g., Millstone's \$2.1 million fine) receive a discount because of their protracted outages. The middle-of-the-road plants are the only ones paying full fare.

Largest single failure of inspection and enforcement programs is that they lack credibility. From the public's perspective, credibility will never be restored as long as NRC staff steadfastly maintains that every violation and event lacks safety significance. The public simply does not believe that the NRC would fine a utility \$2.1 million for "safe" behavior.

Use of Performance Indicators and Performance Assessment

NRC staff does not need a new or revised performance assessment process it needs to do something tangible when the process being used indicates a licensee is not performing adequately.

Examples: Millstone, Salem, and the Watch List perennial Dresden Recall Mr. Kenyon's comment to the Commission that he found NU to be the most dysfunctional organization he ever saw. If Mr. Kenyon could reach that conclusion during his first week at NU, NRC staff must have known that Millstone was in trouble.

Development of Risk-informed Regulations and Regulatory Policies

Risk-informed regulation cannot proceed unless the risks are known. Until plants are generally in conformance with their design and licensing bases such that their Individual Plant Examinations are valid, risk-informed regulation cannot be implemented.

Examples: Pilgrim, Vermont Yankee, and D C Cook all responded to NRC's October 9, 1996 50.54(f) letter on design bases information by stating that they everything under control:

Subsequent NRC inspection showed that Pilgrim did not have strong control over design bases and consequently was performing weak operability determinations. Pilgrim committed to DBD effort.

NRC A/E inspection revealed numerous shortcomings in design bases control at Vermont Yankee. Vermont Yankee committed to expanded, revamped DBD program.

NRC A/E inspection triggered shut down of both units at D C Cook. Both units are likely to remain shut down for over a year while extensive plant and administrative changes are made.

All of these plants had previously submitted their IPEs in response to NRC Generic Letter 88-20. Yet these findings unequivocally demonstrate that these risk assessments were useless because they did not accurately reflect the actual plant conditions.

During the current design bases Amnesty Program, licensees have reported literally dozens of design bases problems that dated back to original construction. Many of these problems required physical plant changes or procedure revisions to correct. These deficiencies are reality, yet the IPEs do not account for these com-

mon-mode failures. Risk assessments should account for all possible failure modes, not just the mathematically convenient ones.

The industry is lengthening surveillance and inspection intervals based on empirical database of equipment failure rates. However, these activities have also detected cases of sabotage and inadvertent component mispositioning. It is not apparent that the justification for longer testing and inspection intervals has accounted for these other risk factors. Risk-informed regulation must include all risks.

Timeliness of NRC Processes

NRC staff should not establish timeliness goals unless it also provides resources and oversight necessary to ensure that time frames are not met at the expense of quality.

Example: Recent emphasis on closing allegations within 180 days may be causing a high percentage of them to be closed without the underlying issues being addressed.

Whenever possible, NRC staff should live by same timeliness standards mandated for licensees.

Example: Per 10 CFR Part 21, licensees have up to 60 days from discovery of a potential safety hazard to justify why it is not a problem or report it to the NRC. The NRC, upon receipt of a 10 CFR Part 21 report, can and will evaluate it at a much more leisurely pace.

UNION OF CONCERNED SCIENTISTS,
July 20, 1998.

CHAIRMAN SHIRLEY A. JACKSON
COMMISSIONER GRETA J. DICUS
COMMISSIONER NILS J. DIAZ
COMMISSIONER EDWARD MCGAFFIGAN, JR.
United States Nuclear Regulatory Commission
Washington, DC 20555-0001

DEAR CHAIRMAN JACKSON AND COMMISSIONERS: UCS appreciated the opportunity to participate in the roundtable discussion on Friday, July 17, 1998. Three issues raised during that discussion require our further comment:

An industry representative stated Friday, and others have stated similar sentiments in various forums, that the NRC over-reacted to Millstone. UCS does not share this characterization. In any event, it must be noted that an NRC reaction would not have been necessary had the Millstone licensee and the industry fulfilled its legal obligations. In the late 1980's, the NRC was concerned about design bases control and configuration management issues. The industry assured the NRC that it had these areas under control. Millstone clearly demonstrated that this assurance was unwarranted.

It should also be pointed out that on the very day of this roundtable discussion, ten (10) US nuclear power plants (Clinton, D C Cook 1&2, LaSalle 1&2, Millstone 1&2, Beaver Valley 1&2, and Indian Point 2) were shut down while they resolved design bases and configuration management problems. These plants are not enduring protracted outages because the NRC saddled them with too many Level IV and uncited violations they are shut down because they failed to properly implement their design control and configuration management programs.

Several people commented Friday about "inspector mischief." It is UCS's perspective that NRC inspectors are a strength and not a weakness. We contend that these capable individuals are inadequately managed because they are not given well-defined, objective criteria to measure plant performance against. Inspectors cannot be the primary fault of the NRC's inspection program their reports are signed out by NRC regional and headquarters supervision.

We maintained that an obstacle to risk-informed regulation was that all risks are not being accounted for. For example, design errors are handled differently than operator errors. Individual plant examinations (IPEs) include probabilities for operator mistakes even though licensee event reports contain sections explaining what actions will be used to prevent recurrence of such mistakes. Thus, IPEs recognize that operator errors are a fact of life.

Design errors are treated differently. The reality of the past few years is that safety systems at many operating nuclear power plants contained design errors dating back to original plant construction that would have prevented, or seriously impaired, their functioning in case of an accident. Yet despite the growing empirical database of such findings, IPEs do not account for design errors that might prevent safety systems from functioning. It is possible to calculate design error probabilities from the existing data just as the operator error probabilities are determined.

While the focus of the roundtable discussion was on areas in which the various stakeholders felt that the NRC needed to improve, we would be remiss if we did not comment that the NRC does many things very well. It is, in fact, this demonstrated capability that gives us hope that the NRC will be able to resolve the weak areas discussed last Friday.

RESPONSES BY DAVID A. LOCHBAUM TO ADDITIONAL QUESTIONS FROM SENATOR LIEBERMAN

Question 1. You have expressed concern about the use of risk in NRC safety regulations, independent of strong design standards and good management practices. What is the appropriate use of risk-informed regulation by the NRC, and what are its limitations?

Response. Risk-informed regulation has been appropriately used by the industry and the NRC to establish priorities. For example, plant owners routinely use risk information to determine schedules for managing work backlogs. In addition, the NRC uses risk information to determine which safety systems their inspectors examine. Results from available risk models generally permit the relative importance of safety systems to be determined such that these kind of applications are meaningful.

The limitations of the risk models and in the conformance of plant design and operations with assumptions made in the risk models prevent risk-informed regulation from making go/no-go decisions. Unfortunately, risk models have been used for this purpose. For example, the NRC used the results from a draft risk assessment to dismiss safety concerns about the design of the spent fuel pool cooling system at the Susquehanna nuclear plant in Pennsylvania. The draft risk assessment contained more than fifty (50) errors and omissions, yet its non-conservative results were used to dismiss a safety concern that affected nearly thirty-five operating nuclear plants.

Results from available risk models, even if corrected for gross errors as in the Susquehanna example, are not reliable enough to define the cutoff point for resolving safety concerns. At least, not unless that threshold is conservatively low, 1x10⁻⁶ or lower.

Risk-informed regulation is further limited by its emphasis on core damage frequencies. Virtually all of the plant-specific risk assessments examine postulated accident sequences that culminate in severe reactor core damage. Many of the plant systems designed to protect the public from radioactivity released during an accident, such as the containment filtration systems, cannot fail in any way to initiate or exacerbate a core damage accident. Thus, the risk assessments assign these plant systems low safety significance. However, if there is a reactor core damage event, as occurred at the Three Mile Island plant in March 1979, these plant systems must function to limit public health consequences.

UCS feels that risk-informed regulation must properly recognize the vital importance of plant systems which protect the public and the environment in event of a reactor core damage event.

Question 2. The GAO has concluded that the competency of a nuclear plant's management is perhaps the most critical factor in safety performance. This conclusion makes basic common sense. What are the views of Panel II members on this matter? How best can the GAO recommendation be implemented, including by the NRC?

Response. UCS agrees fully with the GAO's conclusion regarding the role of management competency in plant safety performance. Prior to joining UCS, our nuclear safety engineer worked for 14 years as a consultant to the nuclear power industry. He had long-term assignments at some of the best performing nuclear plants and also some at plants which were deservedly on the NRC's Watch List. The fundamental difference in performance was management's ability to cultivate and sustain a proper attitude toward safety.

The best way for the NRC to monitor management competency would be to consistently implement objective standards in its inspection, enforcement, and assessment programs. We feel that the NRC allows its inspection findings, its enforcement actions, and its assessment reports to be unduly influenced by its subjective evaluation of plant performance. Consider, for example, two plants which have the same degraded condition. The NRC discounts the significance of the problem for the plant it feels is in general good health, while it upgrades the severity of the very same problem for the plant it feels is not doing so well. This subjective treatment artificially widens the perceived gap in plant performance. The NRC's approach masks declining performance at a "good" plant until it drops so far that it can no longer

be disregarded. Conversely, the NRC's approach prolongs the time that a "bad" plant must spend in the regulatory doghouse even though its actual performance is improving.

The NRC must allow objective inspection and enforcement data to dictate the results from its plant performance evaluation, instead of allowing just the opposite. The most accurate measure of management competency available to the NRC would be plant performance evaluations based on consistently applied objective criteria. Then, plants with a high number of inspection findings and enforcement actions would warrant closer NRC interest in management capability.

Question 3. You have expressed general agreement that the Watch List process—by which the NRC is supposed to provide an early warning about problem plants—is not working well. What specific changes would you recommend to improve this process?

Response. UCS recommends that the NRC adopt an assessment process that uses objective criteria to determine performance rankings. Their current process allows NRC senior managers to adjust rankings upward or downward based on subjective feelings. In the past, such subjectivity masked declining performance trends at several plants. It also unnecessarily prolonged the time that some plants spent in regulatory distress.

UCS recommends that the NRC's assessment program include a report, at no less than an annual frequency, for all operating nuclear plants. We suggest that the NRC Regional Administrator could brief the Commissioners on the performance on all plant within his/her region. The scope of this briefing would cover the NRC's assessment for each plant. The briefing would also include the NRC's inspection plans for the upcoming year to address regulatory concerns at each plant.

UCS feels that the current Watch List process is too heavily focused on determining who makes the list. This emphasis apparently distracts the NRC's attention from efforts it needs to take to induce a performance turnaround at the problem plants. The nearly seven (7) year residence of the Dresden plant on the Watch List is the classic example.

WCS's proposed process would de-emphasize the selection of the Watch List plants. The Regional Administrator would discuss the NRC's assessment of performance at all plants in the region, along with the regulatory actions planned to deal with any areas of weaknesses. This accountability, explicit on the NRC's part and implicit on the plant owner's part, should lessen the chances that poor performance will be sustained.

Since the NRC has divided the country into four regions, a Regional plant performance briefing could be conducted each quarter. UCS recommends that the NRC consider holding these quarterly briefings in the NRC's regional offices or in the public meeting room near a plant in the region. This would allow the public in the communities around the nuclear plants to observe the proceedings.

RESPONSES BY DAVID A. LOCHBAUM TO ADDITIONAL QUESTIONS FROM SENATOR INHOFE

Question 1. In your oral testimony, you stated that UCS has completed a study showing that the current US nuclear plant could shutdown at the end of their current license period, and be replaced with renewables and conservation without the need to emit further greenhouse gases into the environment. Please provide a copy of this report along with justification of the assumptions used in projecting the levels of conservation and development of renewables technology. Also provide estimates of the costs that would result if the UCS approach were implemented.

Response. Attached please find a copy of Energy Innovations: A Prosperous Path to a Clean Environment, by the Alliance to Save Energy; American Council for an Energy-Efficient Economy, Natural Resources Defense Council, Tellus Institute and the Union of Concerned Scientists. Please note that the conclusion that reductions in greenhouse gas emissions can be accomplished while phasing out nuclear generation is not based on a projection of energy efficiency and renewables under business-as-usual conditions, but as the result of specific policy initiatives to promote efficiency and renewables that are outlined in the study. The study assumed that nuclear generation would be phased out as licenses expire. It examined the level of efficiency, renewables, and other electricity supply side measures would be needed to achieve carbon emission reductions of 10 percent from 1990 levels by 2010. The analysis used the Energy Information Administration's National Energy Modeling System (NEMS). [Note: the referenced document is retained in committee files.]

The cost of achieving those reductions was found to be negative. The net savings for implementing the efficiency and renewables policies was found to grow each

year, equaling a levelized \$19 billion per year through 2010. By 2010, the average household would save \$530 per year. These policies were also shown to increase Gross Domestic Production by \$2.8 billion and income by \$14 billion with the creation of 773,000 new jobs in 2010. Continuation of the policies through the year 2030 was found to yield carbon reductions of 45 percent below 1990 levels. The economic analysis did not continue past 2010.

UCS along with members of the organizations which collaborated in the development of the Energy Innovations report would be pleased to meet with the Subcommittee or staff to discuss the report, its methodology, and assumptions.

TESTIMONY OF STEVEN M. FETTER, MANAGING DIRECTOR, GLOBAL POWER GROUP,
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I appreciate the opportunity to testify before the Subcommittee on Clean Air, Wetlands, Private Property and Nuclear Safety to offer the views of Fitch IBCA on the appropriate role for the Nuclear Regulatory Committee (NRC) in the evolving utility competitive environment. Fitch IBCA is the international credit rating agency that resulted from the December 1997 merger between the New York-based Fitch Investors Service and IBCA Limited of London. I will speak from the perspective of a member of the financial community as well as the former Chairman of the Michigan Public Service Commission. I should also note that I am not a nuclear engineering or nuclear physics expert, and in this regard I am representative of the large majority of investors and financial analysts who play some role in assessing the nuclear industry.

The NRC is at the center of investors' perceptions of the financial risks facing the U.S. nuclear industry. In evaluating utilities that operate nuclear plants, debt and equity investors study closely the processes and actions of the NRC. To the extent that these regulatory responsibilities are carried out in a consistent and predictable manner, investors find comfort with the outlook for both individual nuclear utilities and the nuclear industry as a whole.

It is difficult to envision a competitive electricity market without nuclear being a key element. Nuclear energy today accounts for about 20 percent of U.S. power supply. With state regulators generally providing utilities with almost total reimbursement for above-market generation costs, nuclear plants with their low variable costs are being counted on as a major source of low cost electricity for years to come. The balance that is ultimately struck by the NRC between its oversight responsibilities and the necessities of a free market will be crucial in determining whether these expectations are borne out.

In the past, it has been difficult for investors to predict with any certainty the actions of the NRC. As a former regulator, I can appreciate the pressures under which the NRC operates, attempting to follow statutory mandates that set strict adherence as the goal. Unfortunately, such a policy formulation creates a situation where there are so many standards and requirements that it is difficult for nuclear plant owners to know how to allocate resources, much less for a financial analyst to be able to make an assessment of overall risk.

Investors do not have a clear sense of the factors that the NRC uses to rate individual plants, modify Systematic Assessment of Licensee Performance (SALP) ratings, or place plants on the Watch List. This lack of certainty about the impetus for potential NRC actions has a negative impact on how investors evaluate nuclear companies, especially when one considers the severity of the resulting effects. For example, the posting of a plant to the Watch List is in itself likely to constrain a nuclear operator's financial resources and access to capital. Once the NRC takes that step, it typically leads to a lower stock price, reduced access to the equity market, weakening bond and commercial paper ratings, and higher cost of debt.

To compound the problem, investors perceive that once a plant is taken out of service for any reason, there is a tendency for the NRC staff to seek out additional flaws or issues, whether safety-related or not, for consideration and correction. The result is that an outage of any type holds out the potential for an indefinitely prolonged stoppage, with effects that utility investors most fear: unrecoverable purchase power costs, rate penalties, loss of rate base treatment, and potential fines or other expenditures to support required remedial steps.

As one utility CEO recently confided to me, "We need a new regulatory paradigm, because under the current system every nuclear plant in the country is 10 minutes away from being offline for a year or two." And this from someone who praises NRC Chairman Shirley Jackson's leadership as "tough but fair, in a way that has made the nuclear industry stronger." Needless to say, debt and equity investors are keenly aware of the risk created when any major nuclear plant, regardless of past history,

is potentially moments away from a loss of its operating license and a reduction in its market value of hundreds of millions of dollars.

What this means is that going forward the sensitivity of the NRC to the challenges facing nuclear utilities will be more important than ever before. In the past, utilities operated under a heavily-regulated cost of service-based system. To the extent that regulatory mandates placed additional costs on utility operations, in most cases those expenses were recoverable from ratepayers under cost-based tariffs.

Now, under the evolving competitive regime, all utilities will be called upon to react and deal with marketplace pressures. For nuclear utilities, this will be an especial challenge, because their need for greater flexibility will likely collide with the NRC's traditional highly prescriptive approach to regulating the sector. In the new environment, however, it is incumbent upon the NRC to differentiate between actions necessary for safety and those that have limited or no relationship to safety. The NRC must maintain vigilance over the former and allow flexibility with regard to the latter.

By moving to a risk-informed, performance-based regulatory approach, the NRC will be able to maintain its important safety oversight role, while allowing nuclear facilities to be viable players in the competitive system. During my tenure as a state regulator, the Michigan Public Service Commission (MPSC) distinguished itself by fashioning incentive-based plans in all regulated industries based on performance, service quality, and infrastructure improvement. By stepping away from the usual way of doing things, we permitted utilities to determine the best means to improve both operational and financial performance with benefits flowing through to consumers in the form of lower rates and a more efficient regulatory process.¶A similar approach at the NRC would seem justified to provide utilities operating nuclear plants with the ability and motivation to adopt innovative policies that could afford similar mutual benefits.

Investors and rating agencies will closely monitor the NRC as it goes through the first round of license renewals. With two applications for extension already filed by Baltimore Gas and Electric Co and Duke Power, the NRC has the opportunity to show that its promise of a fair, effective and efficient license renewal process will be a reality. If it succeeds in its goal, investors will be more willing to invest in existing nuclear facilities with the expectation that the plants will be able to operate safely and reliably beyond the end of their license period. If, however, the process for the first applicants bogs down, some plants might be shut down earlier than their currently licensed lives due to the unwillingness of investors to provide additional capital expenditures for a plant that may not be around long enough to provide a fair return.

A similar situation exists with the recent announcement by PECO Energy of their involvement in the proposed acquisition of GPU's Three Mile Island nuclear plant. The process the NRC utilizes and the regulatory rules imposed during consideration of this and other proposed transfers of nuclear facilities will have a major influence on the role nuclear will play in the competitive electricity market. An appreciation by the NRC and the Congress that the changing dynamic calls for reorientation of the NRC from a prescriptive enforcement body with regard to everything a nuclear owner does to one focussed more closely on true issues of safety will be an important step in ensuring a place for nuclear in the new competitive electricity framework.

RESPONSES OF STEVEN M. FETTER, TO ADDITIONAL QUESTIONS FROM SENATOR LIEBERMAN

Question 1. The GAO has concluded that the competency of a nuclear plant's management is perhaps the most critical factor in safety performance. This conclusion makes basic common sense. What are the views of Panel 11 members on this matter? How best can the GAO recommendation be implemented, including by the NRC?

Response. The Congress and the NRC have the responsibility to set clear and objective standards for the level of training, experience and competency necessary of nuclear managers to assure safe operation of the nation's nuclear plants. For the NRC, this oversight responsibility is ongoing and should not be compromised as a result of the electric industry's movement to a competitive orientation. That said, it should not be the role of the Congress, the NRC, or the GAO to assess or set requirements for the efficient operation of a nuclear plant outside the area of safety. In a competitive setting, the market should make those judgments.

Question 2. You have expressed general agreement that the Watch List process—by which the NRC is supposed to provide an early warning about problem plants—

is not working well. What specific changes would you recommend to improve this process?

Response. The concern the financial community has with the Watch List stems from the seeming lack of clear, objective standards that can be relied upon to predict movement on or off the list. NRC Commissioner Edward McGaffigan has shared with me a method by which an analyst can track negative movement for a nuclear utility by asking the utility if it has been informed by its NRC Regional Administrator that it has been a subject of discussion at a periodic management assessment meeting. This would be a precursor to potential placement on the Watch List.

To my mind, a more transparent and public procedure backed by clear and objective safety standards would serve the process better. Industry participants and observers would benefit from a system based on objective standards that provides multiple levels or gradations of potential risk. This would diminish the severe "on-or-off" financial impact of the Watch List process.

