REGULATION AND CONSTRUCTION OF NUCLEAR POWERPLANTS—SOUTH TEXAS NUCLEAR PROJECT

HEARING

BEFORE THE

SUBCOMMITTEE ON OVERSIGHT AND INVESTIGATIONS

OF THE

COMMITTEE ON INTERSTATE AND FOREIGN COMMERCE

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REGULATION AND CONSTRUCTION OF NUCLEAR POWERPLANTS—SOUTH TEXAS NUCLEAR PROJECT

TUESDAY, SEPTEMBER 23, 1980

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON OVERSIGHT AND INVESTIGATIONS,
COMMITTEE ON INTERSTATE AND FOREIGN COMMERCE,
Washington, D.C.

The subcommittee met, pursuant to notice, at 9 a.m., in room 2322, Rayburn House Office Building, Hon. Bob Eckhardt (chairman) presiding.

Mr. ECKHARDT. The subcommittee will commence its hearing.

This morning the subcommittee considers an area of enormous consequence to this country in terms of our environment, as well as our economy and independence, as they are affected by our energy supply. Today's hearing will focus upon the construction of commercial nuclear power plants and the regulation of that construction by the Nuclear Regulatory Commission.

As important as was the debate over the accident at Three Mile Island, no less significant, I believe, is the scrutiny over the construction process by which safety should be built into a nuclear plant. Clearly, an operating unit will be no better in terms of safety than is the integrity of the steel and the concrete of which it is constructed.

The committee is pleased to have the appearance today of the Chairman of the Nuclear Regulatory Commisssion and its Director of Inspection and Enforcement in order that we might discuss the efforts of the Commission's inspection and enforcement process generally, and to examine how that process functioned at one specific project, namely, the south Texas nuclear project.

As we will hear from testimony, the south Texas project has over the past few years experienced significant problems resulting from an inadequate quality assurance and quality control program. These problems reached the point that a $100,000 civil penalty was assessed and a show cause order issued against the licensee, Houston Lighting & Power. [See p. 74].

The difficulties at the South Texas Nuclear Project raised questions of safety, caused delay and increased costs. We want to examine these matters and the Nuclear Regulatory Commission's enforcement activity in connection with that project to determine whether the problems have been corrected, what cost consequences will ultimately be placed on the consumer, and whether there are lessons to be learned for the future.

Before we begin, I believe a word is in order about the adjudicatory responsibilities of the Nuclear Regulatory Commission and the constraints the Chairman of the Commission is operating under in testimony before us today.

There is a line of cases which I believe we should be mindful of when we question the Chairman this morning. These cases have enunciated what is commonly called the Pillsbury doctrine and stand for two central propositions.

First, that when Members of the Congress lean heavily on governmental decisionmakers with respect to matters before these officials in adjudication, the "appearance of impartiality" of the officials may be compromised with the result that they may be disqualified from further participation in the matter.

Second, decisionmakers who declare themselves in congressional testimony and elsewhere on facts which are involved in a proceeding before them may be held to have prejudged relevant issues. The remedy again is disqualification. I know the subcommittee will be sensitive to these considerations in our questioning of Chairman Ahearne today.

At this time, we would appreciate hearing from Chairman John Ahearne and Mr. Victor Stello, NRC's Director of the Office of Inspection and Enforcement.

But before we proceed, Mr. Lent, do you have a statement?

Mr. LENT. Thank you, Mr. Chairman.

I am happy to have you as well, Chairman Ahearne, and your staff before us this morning. for your testimony on the important issue of the safety of nuclear plant construction in general and the south Texas project in particular.

I am as concerned about the safety of nuclear powerplants as anyone in this room. My own District's utility, Long Island Lighting Co., is building one plant, Shoreham, right now. However, we are going to have to face some hard facts. Our dependence on foreign oil has emerged as an intolerable threat to our national security and the state-of-war and active armed conflict now between Iran and Iraq show how frighteningly fragile our Middle East oil supply really is. What if this conflict spreads?

Thus, the importance of your agency in implementing the announced Federal policy of reducing dependence on foreign oil cannot be overstated. Nuclear power is an essential alternative that we have. The Economic Regulatory Administration reports that 40 nuclear facilities are scheduled to go into commercial operation by 1983, displacing 374,600 barrels of foreign oil daily. Lilco's Shoreham facility for Long Island is one of them, yet Lilco has been struggling for over 5 years to get NRC approval.

Chairman Ahearne, I hope you are aware that my district is almost totally dependent on foreign oil, as is most of the Northeast. I understand there are many reasons for these interminable delays. One weak spot is surely the number of groups which are allowed to intervene in licensing proceedings. Another is the fact that so many key NRC personnel were taken off the licensing process after the Three Mile Island incident.

In any event, it is very clear that we must get these plants into operation. Let's do it quickly. Let's do it safely. Let's do it before another interruption in the supply of foreign oil.

Thank you, Mr. Chairman.

Mr. ECKHARDT. We customarily swear the witnesses before this subcommittee.

[Mr. Ahearne and Mr. Stello sworn.]

Mr. ECKHARDT. Mr. Chairman, you may proceed in your own order.

TESTIMONY OF HON. JOHN F. AHEARNE, CHAIRMAN, NUCLEAR REGULATORY COMMISSION, AND VICTOR STELLO, JR., DIRECTOR, OFFICE OF INSPECTION AND ENFORCEMENT, ACCOMPANIED BY HAROLD D. THORNBURG, DIRECTOR OF DIVISION OF REACTOR CONSTRUCTION INSPECTION, AND KARL SEYFRIT, DIRECTOR OF REGION IV

Mr. AHEARNE. Thank you, Mr. Eckhardt.

Mr. Chairman, and members of the subcommittee, I am pleased to appear before you to discuss the south Texas nuclear powerplant and other related subjects identified in your July 11 letter inviting me to testify.

The NRC's principal mission is to protect the public health and safety in the field of nuclear energy. This is accomplished through the processes of licensing and regulation, coupled with an inspection program to monitor licensee's compliance with the terms of the license and with the regulations.

These NRC processes have been applied to the south Texas project.

NRC's inspection activities led to the enforcement action against south Texas which is the subject of principal interest today.

I have with me Victor Stello, Jr. who is the Director of the Office of Inspection and Enforcement. Mr. Stello will provide details of the problems at the project. Harold D. Thornburg, the Director of the Division of Reactor Construction Inspection and Karl Seyfrit, the Director of region IV, where the south Texas plant is located, are also here, and the four of us will respond to any question you may have.

In addition, because of the issues that the chairman had alluded to in his opening remarks, our general counsel is here to advise me on ex parte matters which we may get in to. Hopefully not, but if we do, he will advise me.

As a background, the construction at the south Texas project started in late 1975 following issuance of a Limited Work Authorization by the NRC. Construction permits were issued by the NRC in December of 1975. The pressurized water reactors used in the plant are of Westinghouse design. The licensee is Houston Lighting & Power Co. Brown & Root, Inc., is the architect/engineer as well as the constructor. At this time, construction of the first of two units at the site is a little less than 60 percent complete, and the second is a little more than 20 percent complete.

As perceived by the NRC, the basic problem at south Texas can be summarized as inadequate licensee control of the construction process, leading to serious deficiencies in the quality assurance program. As a result, we have taken a number of enforcement actions in this case, including the issuance of immediate action letters and a show cause order and the imposition of civil penalties.

Mr. Stello has further details concerning that effort in his testimony.

Before I turn to the specific questions that you asked for in your letter, I would like to note that last week—last Friday, in fact—the Commission ruled upon a request by two intervenor groups for hearing on the show cause order which had resulted from our inspection enforcement effort, and that order was published yesterday. Consistent with recent case law at our agency, the Commission declined to order a hearing on the intervenors' quality assurance allegation in the context of the enforcement action.

However, recognizing the seriousness of those allegations and the information uncovered by Mr. Stello, the Commission unanimously agreed that the intervenors should be permitted to fully litigate those charges in the pending operating license proceeding for the south Texas facility, and that the licensing board in that case should issue an expedited, partial initial decision on those charges.

The Commission indicated that the operating license application might be denied if the facts support an unacceptable abdication of either responsibility for or knowledge about the south Texas project on the part of the applicant.

In approving that approach, of course, the Commission did not presume to prejudge the pending operating license proceeding, in the same way that I will emphasize my testimony shouldn't be viewed as reaching judgments about the issue in that proceeding. That proceeding must be resolved solely on the basis of the evidentiary record compiled in it; the statements I make here today which relate to the matters at issue in the proceeding should be regarded as provisional.

In your letter of July 11, you asked for comment concerning the different forms of project management employed by utilities in the construction of a nuclear powerplant and their relative merits.

Houston Lighting & Power has employed the same firm as both architect/engineer and constructor. Some other licensees have used a similar approach. There are a number of variations in project management involving licensee, architect/engineer and constructor.

For example, the Tennessee Valley Authority frequently acts in all three capacities, while other licensees employ architect/engineers who are independent from the constructor. It has been our experience that any project structure can be effective if it is directed by a licensee who is committed to a strong quality assurance program.

In our judgment, a successful licensee is one whose own technical and quality assurance staff, supplemented where necessary by consultants or contractors, can assess whether quality work is being done at its facility. Our regulations make it clear that the licensee is responsible for determining that a nuclear powerplant is constructed and operated in compliance with all appropriate standards and requirements.

You also asked for comments concerning the proper organizational structure for assuring that quality assurance and quality control programs are carried out properly. As related to south Texas, there are two aspects worth noting. First, NRC regulations require the

licensee to insure that its quality assurance people have sufficient independence from cost and schedule considerations to do their job.

At south Texas, we found that quality control inspectors were subject to production pressure, lack of support by their own management, harassment, intimidation, and threats. Second, our regulations also require that the quality assurance organization report to sufficiently senior management within each organization involved in quality assurance to give it the freedom to identify quality control problems; to initiate, recommend or provide solutions; and to verify the implementation of solutions.

Our inspections at south Texas indicated licensee senior management was insufficiently involved in quality assurance actions at the site to provide the quality organization freedom from influences detrimental to its functions.

You also asked for comments concerning the ability of nuclear power plant constructors to attract qualified craftsmen and any problems that they might face in that regard. This really is not an area for which we have specific responsibilities, and is best addressed by the constructors themselves.

I will, as an aside, comment that in the reviews that we did, it did appear that one of the problems at south Texas was an insufficiently high pay scale being offered, and so that once the people—like welders, for example—were trained, they immediately then went to other welding jobs in which they were now trained for, but they could get a higher pay. And one of the actions, I believe, that the licensee has taken is to raise the pay scale they are offering for those jobs.

Your staff also expressed an interest in the impact that the NRC action plan, resulting from our assessment of the Three Mile Island accident, might have on the south Texas project. The so-called TMI action plan, formulated as a result of the TMI-2 accident, was developed to provide a comprehensive and integrated plan for the actions judged necessary by the NRC staff to correct or improve the regulation and operation of nuclear facilities based on the experience from the accident at TMI-2 and the official studies and investigations of the accident.

Most of those specific actions are directed to operating plants, so there is little immediate applicability of those items to south Texas. Where any plant modifications are found to be applicable to south Texas, these modifications and the schedules for implementation will be addressed during the staff's review of the application for an operating license.

Those action plan items which do involve the construction process have specific applicability to south Texas only to the extent that, when implemented, they will improve selected features of the licensee's quality assurance activities or redirect the NRC's own inspection activities.

I go on to list a few other items in the prepared testimony which I am submitting which refer specifically to the action plan.

That basically, I think, summarizes my answers to the questions. I will be glad to address any particular questions the subcommittee has, either before Mr. Stello testifies or after, whatever your pleasure.

[Testimony resumes on p. 11.]

[Mr. Ahearne's prepared statement follows:]

STATEMENT OF

JOHN F. AHEARNE, CHAIRMAN

U.S. NUCLEAR REGULATORY COMMISSION

Mr. Chairman and Members of the Subcommittee, I am pleased to appear before you to discuss the South Texas nuclear power plant and other related subjects identified in your July 11 letter inviting me to testify.

The NRC's principal mission is to protect the public health and safety in the field of nuclear energy. This is accomplished through the processes of licensing and regulation coupled with an inspection program to monitor licensee compliance with the terms of the license and with the regulations. These NRC processes have been applied to the South Texas project. NRC's inspection activities led to the enforcement action against South Texas which is the subject of principal interest today. I have with me Victor Stello, Jr., Director of the Office of Inspection and Enforcement. Mr. Stello will provide details of problems at the project. Harold D. Thornburg, Director, Division of Reactor Construction Inspection and Karl Seyfrit, Director of Region IV, where the South Texas plant is located, are also here. The three of us will respond to any questions you may have.

As background, construction at the South Texas project started in late 1975 following issuance of a Limited Work Authorization by the NRC. Construction permits were issued by the NRC in December 1975. The pressurized water reactors used in the plant are of Westinghouse design. The licensee is Houston Lighting and Power Company. Brown and Root, Inc., is the architect/engineer as well as the constructor. At this time construction of the first of two units at the site is somewhat more than 50% complete.

As perceived by the NRC the basic problem at South Texas can be summarized as inadequate licensee control of the construction process, leading to serious deficiencies in the quality assurance program. As a result, we have taken a

number of enforcement actions in this case including the issuance of immediate action letters and a show cause order, and the imposition of civil penalties. Mr. Stello will provide details concerning our inspection and enforcement effort in his testimony.

Your letter of July 11 asked for comment concerning the different forms of project management employed by utilities in the construction of a nuclear power plant and their relative merits. Houston Lighting and Power has employed the same firm as both architect/engineer and constructor. Some other licensees have used a similar approach. There are a number of variations in project management involving licensee, architect/engineer and constructor; for example, TVA frequently acts in all three capacities while other licensees employ architect/engineers who are independent from its constructor. It has been NRC's experience that any project structure can be effective if it is directed by a licensee who is committed to a strong quality assurance program. In NRC's judgment a successful licensee is one whose own technical and quality assurance staff, supplemented where necessary by consultants or contractors, can assess whether quality work is being done at its facility. Our regulations make it clear that the licensee is responsible for determining that a nuclear power plant is constructed and operated in compliance with all appropriate standards and requirements.

You also asked for comments concerning the proper organizational structure for assuring that quality assurance and quality control programs are carried out properly. As related to South Texas there are two aspects worth noting. First, NRC regulations require the licensee to insure that its quality assurance

people have sufficient independence from cost and schedule considerations to do their job. At South Texas the NRC found that quality control inspectors were subject to production pressure, lack of support by their own management, harassment, intimidation, and threats. Second, NRC regulations also require that the quality assurance organization report to sufficiently senior management within each organization involved in quality assurance to give it the freedom to identify quality problems; to initiate, recommend, or provide solutions; and to verify implementation of solutions. NRC's inspections at South Texas indicate licensee senior management was insufficiently involved in quality assurance actions at the site to provide the quality organization freedom from influences detrimental to its functions.

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Your staff also expressed an interest in the impact that the NRC Action Plan, resulting from its assessment of the Three Mile Island accident, might have on the South Texas project. The so-called TMI Action Plan, formulated as a result of the TMI-2 accident, was developed to provide a comprehensive and integrated plan for the actions judged necessary by the NRC staff to correct or improve the regulation and operation of nuclear facilities based on the experience from the accident at TMI-2 and the official studies and investigations of the accident. Most of the specific actions are directed to operating

plants so there is little immediate applicability of those items to South Texas. Where any plant system modifications are found to be applicable to South Texas, these modifications and the schedules for implementation will be addressed during the staff's review of the application for an operating license.

Those Action Plan items, which do involve the construction process, have specific applicability to South Texas only to the extent that, when implemented, they will improve selected features of the licensee's quality assurance activities or redirect the NRC's own inspection activities. For example, action has been initiated which will require an upgrading in the qualifications of licensee quality assurance personnel. NRC has revised its inspection procedures to apply more inspection effort to licensee's quality assurance actions earlier in the construction cycle and has initiated development to perform independent measurements at construction sites. In addition, NRC is expanding its resident inspector program to place inspectors at construction sites. The resident assigned to South Texas reported onsite in September 1979.

There are other TMI Action Plan items related to construction which, when implemented, could affect NRC oversight of nuclear power plant construction. These tasks involve such things as examining the possibility of requiring the licensees to perform the entire QA/QC function at construction sites and requiring that substantive changes to the licensee's approved program be submitted to NRC for review. The NRC has begun work on some, but not all, of the Action Plan items related to construction.

The NRC is concerned that problems similar to those at South Texas may exist at some other plants under construction and is reviewing how to apply the "lessons learned" from South Texas to other construction sites. Mr. Stello will subsequently describe how a team approach to evaluate quality assurance effectiveness was used at South Texas. That sort of approach is now being considered for use in construction inspection elsewhere. The timing of a team inspection is critical since sufficient, diverse production work must be underway to permit assessing quality assurance. Initially, the use of construction inspection teams would be on a trial basis since personnel to support this would be drawn from the routine inspection program, where normally a single inspector is involved. Ultimately, additional personnel resources may be necessary to permit the best combination of team and routine inspections. Such resources would be requested in the normal budget process.

Mr. Stello will discuss the requirements we have imposed upon Houston Lighting and Power with regard to South Texas. I will be glad to answer any questions you may have, either now or after Mr. Stello completes his testimony.

Mr. ECKHARDT. Mr. Chairman, I share my minority senior Member's views about the desire to be in a position to back out of foreign oil. We have a similarity of viewpoint, perhaps, or similarity of situations throughout the country, though it may arise in somewhat different ways.

For instance, he mentions his area, the need for other energy sources directly to supplant foreign oil which largely supplies his area. I think that probably would be the case with Mr. Markey of Massachusetts who is here with us this morning.

In the Texas situation, it is not all that different, because the cost of coal tends to approach, through railroad rate costs, the equivalent cost of foreign oil—BTU value—and unless there is some competition, or at least potential competition from the nuclear resource, there may be no real competitive control of price, because, as you recall, in 1978, we provided in the fuel use bill that the generation of electricity by 1990, except in peak-loading cases and with some minor exceptions, would have to forgo the use of gas. That means, pretty largely in the immediate future, the use of either coal or nuclear.

So I, too, am very, very concerned about knowing the facts about nuclear energy. Also attempting to reduce mistakes which can be very costly. I understand that cost overruns have run at an enormous ratio in some of these plants, and the example that we have in south Texas may be a good one.

I don't mean here to in any way go in too deeply into the final question of guilt or innocence, but rather to look at this as an example of the situation which may exist in other places in the country. Against that background my questions will be asked.

I know that you have experience respecting many nuclear constructors and many licensees. I understand that there is one thing that may be somewhat unusual about the south Texas situation and that is, as I understand, the licensee is, for the first time, I believe, moving into the nuclear field in constructing a plant of that nature. Is that correct?

Mr. AHEARNE. It is correct. This is the first nuclear plant for that company. That doesn't make it completely unique. There are obviously other companies doing that.

Mr. ECKHARDT. Obviously so. But you also mentioned that one of the very desirable situations is one in which the licensee is itself experienced and able to conduct quality control. That, of course, would come with having had some experience with nuclear plants or having derived it from a deep study of other nuclear plants before commencing an operation, I assume.

Mr. AHEARNE. That is correct.

Mr. ECKHARDT. Then there are several ways that these jobs are ordinarily done. One of the typical ways, as I understand it from your testimony and what I have found from other sources, is to do the job very much as one would do any other large construction job: The building of an expensive residence, the building of a commercial building; that is, to have a different contractor from the architect.

The architect, in an ordinary architectural contracting situation, is the person who sees to it that specifications are followed. The contractor and the architect are somewhat in conflict, or at least

they may not be rolled into the same person if quality control inspection is to be done properly. Yet I understand that in this case, the architect/engineer and the contractor are the same, that is, Brown and Root.

Mr. AHEARNE. That is correct, Mr. Chairman. That does offer more potential for a problem, particularly when you do have, as you mentioned earlier, a company that is going into this for the first time.

As I tried to cover in my testimony, when we looked at the variety of ways plants have been built, we find that there are some that do it the same way that Houston is doing it. There are some, primarily the larger nuclear organizations—TVA and Duke Power—that will do all three, but those are by now well experienced companies that are very familiar with the——

Mr. ECKHARDT. Well, I would assume that that option would be as good as any other if the licensee were sufficiently experienced, because the licensee's interests are, one, to build a plant cheaply, but, two, to be assured that the plant is a good plant that will last and withstand dangers, and it is ultimately the owner of the plant and therefore its interest is very much like the owner of a residence, that the residence should be built properly.

However, it would seem to me that in a situation where there is presently little experience in the nuclear field, as in the case of Houston Lighting & Power, that perhaps the other approach—that is, the use of an absolutely independent engineering/architectural firm with experience in the field—might well be called for to a greater extent than it would be called for in the TVA type situation. Would you say that is generally correct?

Mr. AHEARNE. That would, in general, be my feeling, Mr. Chairman.

When I had discussions with the staff back in the summer on that specific question, they could recall examples which would indicate that a utility going for the first time into a construction could successfully—very successfully—handle it by having the same company do both. It requires a much greater attention on the part of that licensee going into it, recognition of the complexities of nuclear power plant construction; a willingness to get a level of staffing that they might not otherwise do, a willingness to very aggressively follow the quality assurance side of the program. And that was not present in this particular case.

Mr. ECKHARDT. Now there would be another type of situation, and that is one where the licensee might not be experienced, but a construction company might have developed, over a long period of experience, the ability of separating its engineering and architectural functions from its construction function in nuclear plant construction.

That, I guess, is sometime the situation with respect to the building of nuclear plants in the United States. Would that be true?

Mr. AHEARNE. Yes.

Mr. ECKHARDT. Does Brown and Root fall in that category?

Mr. AHEARNE. I don't believe so. As I recall—and I'll ask Mr. Stello to verify—Brown and Root had not had much, if any, experi-

ence prior to going into this. I think they are building one other powerplant.

Mr. ECKHARDT. And their experience would be purely in the construction side, or at least heavily in the construction side, rather than in the engineering and architectural side, as I understand it.

Mr. AHEARNE. Or the architect/engineering of nonnuclear power plants.

Mr. ECKHARDT. That's right. And, of course, even if there were experience in engineering and architectural operations, it would also require the development of a rather sophisticated separation of inspection functions and of supervision at a relatively high level on both sides of the operations, as I understand it, to accomplish a desirable objective.

Mr. AHEARNE. That's correct.

Mr. ECKHARDT. I am generally familiar with that area and I know that there is probably as good a pool of highly trained craftsmen related to large industrial facilities as there is anywhere else in the United States, because, of course, the Houston area is the heart of the petrochemical industry and the biggest concentration of it in the United States and perhaps in the world.

Second to that, there is a very large similar complex in the Beaumont-Port Arthur area. Therefore, this is not the development of an industrial plant in a vacuum of qualified labor. Am I correct in that assumption or am I leaning too much in favor of my own area?

Mr. AHEARNE. Let me defer to Mr. Stello for that, if I could.

Mr. STELLO. I think there is a large pool of trained craftsmen in that area. As you are aware, the location of the plant is somewhat removed and they have to attract, then, those trained people to the area of the plant. In order to do this, it requires competitive salary scales and a training program to bring in unskilled labor to do that.

One area where we saw that problem was in welding and it was correctable, obviously, by making the salary structure competitive with the competition for this same kind of talent in the petrochemical areas in Houston and other parts of Texas.

Mr. ECKHARDT. Just to get the picture straight here, geographically, we are talking about a distance, say, from the Beaumont-Port Arthur area—of course, the Houston area is somewhere in between, but a distance of from there to the south Texas nuclear facility, roughly the distance from Washington, D.C., to New York. Is that not correct?

Mr. STELLO. That's my recollection; yes, sir.

Mr. ECKHARDT. Then Houston would be somewhere in between, but still a considerable distance from the plant. And we have in that area a rather mobile craft force for this type work, but it may be somewhat difficult to marshal them at any particular place unless there is some way to contact the craftsmen, as I understand the situation.

Mr. STELLO. Well, the point I was trying to make is that if you are trying to attract those trained craftsmen from that area to move them into the area of the plant, you need to do that with a competitive salary scale. They clearly are not going to make that

move for less money than the salaries that were being paid in the Bay City area of Texas, and in the welding area it was somewhat lower.

Mr. ECKHARDT. How much lower?

Mr. STELLO. I don't recall the numbers.

Mr. ECKHARDT. I understand about $2.45 an hour. Does that sound like the ballpark?

Mr. STELLO. Mr. Seyfrit indicates that's within the range.

They were then trying to train people from within the area that were willing to move and go into the welding area. They would train them, and then they could, after being trained, move out and become mobile to other jobs at higher salary. And that was a problem.

We're talking at the moment strictly of the welders and that's pretty well where the area that we saw this problem was confronting—to welding.

There are a lot of other craftsmen required for the building of a project of this size, and we haven't seen or had any indication that we had problems in these other areas. Welding, because of the need for welders in the petrochemical industry, was where we saw the problem. We haven't seen it in other crafts. It was the one area isolated that we had identified the problem.

I am trying to put that so that it's in context in what we have seen.

Mr. ECKHARDT. Mr. Stello also has a statement. If other members of the committee want to ask now, or if they want to defer, either way will be all right. I shall not commence by asking Mr. Stello until after the statement. What is your preference?

Mr. LENT. I have a few questions.

Mr. ECKHARDT. Surely. Go right ahead.

Mr. LENT. If the chairman please, I do have a few questions for Chairman Ahearne.

Mr. Chairman, it now takes—as I understand it—about 8 to 10 years average to get a nuclear power plant into commercial operation, and often this process is marked by delays and increased costs in the construction process that in turn are passed along ultimately and absorbed by the consumers.

It seems to me that this delay is a luxury that this Nation can no longer afford, either from an economic standpoint or from a national security standpoint.

I would like to ask you if you feel this time frame is too long.

Mr. AHEARNE. Let me, if I may, Mr. Lent, answer by making a couple of points and then address that specifically.

If the delay is caused for reasons that don't relate to the fundamental process of trying to get a plant licensed, then I would agree that it's a luxury we can't afford. Many times, however, the delays have been caused by problems which have arisen either in the location of the plant or in the design of the plant, and it has taken time to resolve those problems.

Those tend to be problems, for example, with the design of the plant to meet seismic qualifications. Those are problems which would have to be resolved prior to the plant being licensed to operate, or once found, if the plant were operating, the plant would have to be shut down to have them be resolved because they are

problems that have to be resolved so that we can at say—NRC can say—that the adequate protection of public health and safety is met.

A second area of problems arises in trying to make sure that the administrative procedures that are appropriate to allow people to have a fair say at resolving concerns they have get completely aired. There have been cases where courts have eventually thrown back because issues weren't completely aired in the early stages. I think that we are now in a process of trying to have more complete airing early to avoid that part of the problem.

So I guess when you say do I agree that we should try to cut delay that is not needed, I would certainly agree. The argument and the debate that people involved in the nuclear licensing processing always have is to try to define what are the delays that are appropriate and what are the delays that are inappropriate.

The fact that it takes 8 to 10 years to get a large nuclear powerplant operating perhaps may be 1 or 2 years too long, but just to physically build a powerplant, 4,000 to 5,000 workers on the site, a billion dollars of investment going into all of the equipment and the construction labor, that's a time-consuming process.

We've seen around the world a number of countries who originally have thought that they have licensing processes much shorter than ours. Gradually, their processes are getting to roughly the same kind of length that we have.

So certainly I wouldn't say that the licensing process is the most efficient or as efficient as it should be. It isn't. It is, like most mechanisms, still creaking and we are trying to adjust it; we are trying to improve it. But I don't think it is grossly inefficient.

Mr. LENT. Well, just to go back a moment. You say that problems arise in location and/or design. Isn't the location of the plant and the design of the plant—aren't these threshold questions that are looked at at the time the initial application for construction is filed with the NRC?

Mr. AHEARNE. Well, for example, on location, there is a particular powerplant that comes to mind in the West where, after the plant was substantially built, it turned out that there was a fault—earthquake fault— substantially closer to the plant than the geological survey had originally found, so that is a case of a situation where——

Mr. LENT. Well, that's fairly rare, isn't it?

Mr. AHEARNE. Yes; that is rare, but large delays occur fairly rarely. When you take the average over nuclear power plant licensing times, the long delay time average usually comes about from two or three, or four instances, and that's one of the examples.

As far as the design, in general our criteria allow construction to be begun when the general criteria have been agreed to, but there are still a number of items that have to be completed—designs have to be completed—prior to the plant actually being fully constructed. That's one of the reasons why we have a two-step licensing process.

Mr. LENT. What is the least achievable time frame, in your opinion? That is, how long should it really take, ideally speaking, to get a plant on line? Can we look at the experience of some of the

European countries where they seem to put these plants in operation much more rapidly than we do in the States?

Mr. AHEARNE. Well, we can certainly look at the experience in the European countries. I think we have to consider at least two things when we look at European experience. First, do we count the time the same way? In our case, we have a system where the utility begins to do its planning and goes through a lengthy process before it makes its decision on what kind of a design to use, where to locate the plant.

In some of the European countries, it's a Federal Government decision of what type of plant is going to be built and where the plant is going to be located. They don't have part of that time in which a utility is going through its decisionmaking process.

As far as the actual construction time for the plant, I don't think there is that significant a difference. I would guess that for a 1,000-megawatt plant, a period of time of roughly 8 years is a reasonable time to be aiming at as the most efficient—no problems in the system.

We all have to recognize that Three Mile Island and its after effects have led us at the NRC—have led many people, including industry—to rethink a lot of the approaches that have been taken in the past, and right at the moment, that is going to be very definitely a cause for a longer licensing time, because there are so many things being rethought.

Mr. LENT. I mentioned in my opening statement the Economic Regulatory Administration's calculations concerning the 40 nuclear plants scheduled to come on line by 1983.

Are you, Mr. Chairman, optimistic that these plants can be granted operating licenses by your Commission within that time frame?

Mr. AHEARNE. I haven't seen a recent plant-specific forecast of the Economic Regulatory Administration, so I can't speak to whether we would tend to agree with those specific plants.

I can say that I am confident that as the plants come to us and are ready for operating license, if they have met the requirements, then we will license them. We have so demonstrated in the cases of the plants that we have already addressed this summer.

I recognize that that doesn't really answer your question because there are several sets of requirements that some plants may not be able to meet as readily as other plants. Emergency planning, for example. The requirement that there be adequate emergency plans developed in the area of the plant.

Mr. LENT. Well, I hear the complaint—and you tell me if it's true or false—that many of your key NRC personnel who were involved in the licensing process at various plants have been taken off the job because of TMI. They've all been concentrating on responding to the newspapers and all of the other reports that had to be made following TMI and that, as a matter of fact, this has added incalculably to the delay.

Mr. AHEARNE. Let me respond. The quick answer is yes, there has been a delay because we did, after Three Mile Island, take most of our knowledgable technical people in the licensing review division, the Nuclear Reactor Regulation Division, and turn them to reviewing first, what can we learn from the Three Mile Island

accident? And then, second, how to apply those lessons to the plants then operating.

I believed, the Commission believed, and I still believe that those were the appropriate first-priority items to turn our resources to. We had to make sure, as best as we could, what lessons we could learn from the Three Mile Island accident, and then, since we have roughly 68 plants actually operating, that was the next priority: To make sure that those lessons were applied to those operating plants.

Having done that, then the next item or set of priority of those people has been the plants in the operating application queue, those plants who are in the process of either having filed for operating licenses or about to file for operating licenses, and we did put our people back. They began going back to those early this spring, and I think now there are no plants that are in the operating license line that have a lack of effort being applied to them.

In fact, as I recall, with the possibility of one example over at least the period of time from the middle of—or early March—through the end of next year, I don't think there is any plant where it is scheduled to be finished and ready for fuel loading where at least our staff reviews won't have been done in time to meet those dates.

Whether or not it will get the license at that stage is really up to, in many cases, contested hearings and how the hearing board comes out.

Mr. LENT. Thank you. Thank you, Mr. Chairman.

Mr. ECKHARDT. I shall recognize Mr. Markey and Mr. Corcoran next whether or not we go first with Mr. Stello, but you may choose what you want to do.

Mr. MARKEY. Thank you, Mr. Chairman. I think this is probably a good opportunity, because I think Mr. Corcoran and I are both familiar with Mr. Stello and the work that he's been doing in the aftermath of Three Mile Island.

I want to thank you, Mr. Chairman, for holding this hearing. I think it's an important one because it gives us the opportunity to look at an area that is really a microcosm of all the difficulties with the Nuclear Regulatory Commission, with the utilities, with the architectural and engineering firms, and with all nuclear powerplants in this country and the way in which they have been and are being constructed.

The basic issue before us is whether our nuclear watchdog, the Nuclear Regulatory Commission, is doing its job, and whether the systems that are designed to guarantee safe construction of nuclear power plants actually work.

There have been a long series of disturbing allegations about the safety of the construction of the south Texas project: Safety standards compromised, quality control inspectors intimidated and threatened with violence, and the Nuclear Regulatory Commission looking the other way.

I believe that we are discussing here today an indictment of the entire system that the NRC operates to enforce its safety standards. We are discussing today the south Texas project—one nuclear power plant. But what we say applies to all 68 in operation and 91 under construction. This may be the preface to a tragic story as

these plants go into operation with unknown deficiencies and defects.

Let me ask you this, Chairman Ahearne. You say on page 5 of your testimony:

> The NRC is concerned that problems similar to those at south Texas may exist at some other plants under construction and is reviewing how to apply the lessons learned from south Texas to other construction sites.

What other construction sites are you looking at?

Mr. AHEARNE. Mr. Stello, would you care to answer that?

Mr. STELLO. What we intend to do, based on what we have learned from looking at the south Texas project and, I should hesitate to add, the Marble Hill project, is an indication that our current inspection process, although it does identify problems, it does so slowly, and as you will look at the record on the south Texas project, it does indeed go back several years.

That to me is a frustration as to why now, when we look back, we could not identify the kinds of problems that we have had—indications existed several years ago—earlier.

In light of that knowledge and understanding, we're looking at the way in which we are doing our routine inspections, which is to send a particular inspector out with a particular area of expertise and have him individually look at that particular area.

He provides a report indicating problems, if any, that he has found in that specific, limited area of expertise.

In contrast, in south Texas, what allowed us to draw the conclusions as to where it was in the process that the quality assurance program was not doing the job it needed to do was a result of sending a multidiscipline team down to the site that covered an inspection interval beginning in November through February——

Mr. MARKEY. Of this year?

Mr. STELLO. Last year. Starting in November of last year and going into February of this year.

It looked, in a very comprehensive manner, into all of the aspects of the site, all of the kinds of activities that were ongoing. The project was in a later state of construction where there were, indeed, the beginnings of all of the activities. The mechanical work was underway, the structural work, the welding and the installation of piping and electrical systems, so a comprehensive look at quality was possible.

When we did that, we found that there were, indeed, problems in the quality assurance area. But what we also were able to conclude in the case of south Texas is that while we saw those problems, we did not see that the actual components—the structures and the systems that were there—were being constructed in such a way that we had major safety problems.

I save one area that I intend to cover in my prepared remarks.

In contrast, in Marble Hill, we did, in fact, see the actual structures that were being installed, installed in such a way where we had safety concerns being raised. And in that case, we literally shut down the construction job in August of last year, and it has essentially remained so today.

The speculation that there might be others very early in the construction process where the construction activities are such that the project is only a few percent complete—or maybe even 10 or 20

percent complete—to be able to use the benefit of the experience of these two activities and go forward with a team approach and take a very, very good, hard look at facilities, we are going to do that in the near future on a trial basis. We'll be meeting, in fact, this week with the representatives of the management system responsible for construction within all our field offices—in fact, this afternoon—to discuss a program to put that on a trial basis to see if we can go out there and find other problems such as these, if they exist, if they're there, to bring them to light early and quickly and get any such problems corrected.

Mr. MARKEY. I can understand that. The question is whether it is a good policy to put together new management teams or self-policing agencies by the private sector, or to develop new initiatives for the NRC in the aftermath of Three Mile Island, or as in this case, to begin our inspection of the Texas facility in the aftermath of a television program that last fall did a blistering, scathing indictment of the way in which the inspections had continued over the years and violations had gone on without any real sanctions being imposed. Now, perhaps not coincidentally, we are going to see more action by the NRC right around the time of this hearing to—in my opinion—continue a policy of appeasement rather than take aggressive action to put together a systematic policy of dealing with the oversight of construction and safety problems in our nuclear plants.

Is it possible for us, under this present system that we have, to give any real assurance of safety to people who live in the vicinity of a nuclear powerplant? A recent inspection of the south Texas facility revealed that 60 out of 77 welds were inadequate. Is that not so?

Mr. STELLO. I don't know if the numbers are correct, but I think they are approximately correct.

Mr. MARKEY. Sixty out of 77 welds are bad. Now, as we know, there is no liability on Brown & Root, the contractor, under the Price-Anderson Act.

For example, if an accident occurred, if 50,000 people in Houston were killed, if an entire landscape was devastated, Brown & Root would not be liable for the damage, would it?

Mr. AHEARNE. That's really not, I guess, the fundamental issue. The fundamental issue is——

Mr. MARKEY. It is the fundamental issue, because we're looking back to whether the contractor had any real, vested interest in insuring that these plants are designed safely, or instead whether we have a low bidder, or a contractor who is only interested in quickly and expeditiously slapping this nuclear plant together to meet some artifical timetable so that we can have toast popping up in the greater Houston area.

The question is whether or not Brown & Root will bear any substantial responsibility for the life and property of the people who live in the greater Houston area at the time when the containment area or any other part of the plant is tested by an accident, and we will find out whether the welds are strong enough to withstand the immense pressure.

I contend that when 60 out of 77 welds are found bad, you have a good case for going right in and withdrawing the construction

permit, and then doing a zero-based reanalysis of that entire plant and any others like it across this country to insure that there is no danger to life and property. The real problem here is that under Price-Anderson, the liability system in this country, coal can't compete, gas can't compete, and solar can't compete with nuclear power, because we artificially subsidize the nuclear industry and don't impose responsibility upon it for the consequences of negligent or shoddy practices.

Mr. Ahearne, in light of the fact that Brown & Root are now reinspecting thousands of welds, repairing voids in concrete, examining parts of their piping system, and that all of this extra work is costing the ratepayers money, why don't you just revoke the construction permit? I know you have never done it before, and I know it sounds drastic, but in light of the allegations that have been made and in light of the evidence that you've been able to gather, is it not warranted? What does it take for the NRC to pull a construction permit? What is the level of gravity of violations required for you to pull one and make it possible for us to go back and do a thorough reanalysis?

Mr. AHEARNE. Mr. Eckhardt, I will answer Mr. Markey in general.

We are beginning to get into the area, I think, specifically addressing the south Texas plant that I was concerned about in my opening remarks. We do have——

Mr. ECKHARDT. Mr. Chairman, will you please consider the question as one hypothetically asked with respect to what could be done with respect to the pulling of a permit without regard to this particular plant?

Mr. AHEARNE. Fine. Thank you.

Mr. Markey, the point I had made before you arrived was that we do have an ongoing proceeding with south Texas, so specific questions, particularly regarding contentions in the south Texas case, it is really inappropriate for me to prejudge at this time.

But, in general, I think that the Commission would pull a construction permit if we reached the conclusion that the magnitude of the violations were such that a plant could not be completed to provide the adequate protection to health and safety, or that the licensee who has the construction permit had indicated a complete refusal to make changes to address whatever requirements we had laid on in order to meet that adequate protection of the public health and safety.

The fundamental concern remains that we would not allow any plant to operate that we do not reach a conclusion meets our requirements for that adequate protection.

Mr. MARKEY. The responsibility—the fundamental responsibility—of quality assurance, though, ought to rest with the Nuclear Regulatory Commission. Don't you agree with that?

Mr. AHEARNE. The fundamental responsibility for the quality assurance in the construction of the plant is with the licensee of the plant. We have the fundamental responsibility for insuring that across the board, the licensee meets all of our requirements—one of the requirements being to have a competent quality assurance program.

Mr. MARKEY. But if you were going to establish a system that you really felt was maintaining the highest standards of safety for all the people who live in the near vicinity of nuclear power plants, would you not think that a system which gave the ultimate responsibility to the NRC and had a much larger commitment of NRC resources to the maintenance of safety standards and quality standards at nuclear power plants, would be the course to follow? Even you, Mr. Stello, when testifying last month in a Bay City public hearing, said—please note that his was Mr. Stello. It sounds like me. One could almost put my own quote marks around this. I quote:

> I've looked back over the record and I say what I do; I get frustrated, just as you are. Why didn't the system we have in place somehow identify and bring corrective action sooner? It's a frustration to me because it's not just this project. I've seen it at some others, where I just wonder why we can't get a little bit more responsive to what we are seeing and reach our conclusions more sharply and faster. Unfortunately, I cannot tell you why we are as slow as we are, but we are.

That was Mr. Stello talking. It sounds like something I would send out to the Malden Evening News.

My question is, Why can't we change the system? Why can't we get tough with these people? How long do we have to wait before we realize that the deficiencies that have been revealed, the defects in the welds, the concrete, the soil, all have counterparts in nuclear power plants all across this country? We will not have a really serious reappraisal of the nuclear power system in this country until the Nuclear Regulatory Commission, the watchdog agency, the agency which I feel has abrogated its responsibility, exercises the ultimate authority which it has to rip away a construction permit. Such an action would send out a signal that would have reverberations all across this country among utilities and architectural and engineering firms; would let them know that business-as-usual is ended; that the mindset that has bedeviled this industry over the years has to change, and that we are going to have a beginning of a new era?

Until I see that kind of change, I'm not going to be convinced that the people of Houston are being protected or that they can have any kind of assurances, either from you at the NRC or from the people who are building this plant, that their health and safety is being considered adequately.

Mr. AHEARNE. May I just make a couple of comments?

Mr. Markey, we both have had many other exchanges in many other locations, and I disagree with a number of your points, as you well know.

I do not believe that we have abrogated our responsibility; I do not believe that we have not given a signal. You say that we have not taken the ultimate action. That is true. We have not lifted the construction permit. The plant's construction has been stopped for almost a year. We have imposed a very serious, significant fine on them, and I think we have taken a very drastic action with respect to them.

They have ended up making fairly sweeping changes in their management structure, in the actual shifting or removing people. As Mr. Seyfrit said in that same public meeting that you are quoting, I think that we are skeptical. We remain to be convinced

that those actions are going to be adequate, but we are monitoring very closely, and I don't believe that has indicated any kind of a signal to the rest of the industry other than that we are very serious about insuring the plant's construction safety.

Mr. MARKEY. Well, the 90-day show cause period has elapsed and still you have taken no action.

Mr. ECKHARDT. The Chair has given 15 minutes to each period, because he took that.

Mr. Corcoran?

Mr. CORCORAN. Thank you, Mr. Chairman.

I also very much appreciate the opportunity to see our friends from the NRC before this forum. We've had exchanges in the past, and I don't pretend to have intimate knowledge of the south Texas project, but I think some of the points indicate that it may be symptomatic of our problem.

Before getting into that, however, I would like to raise a question or two about the funding for the NRC in the coming months. As you know, the Congress is considering a sort of unusual solution to providing additional funds for the agencies of Government this year by a continuing resolution.

I am concerned about adequate staffing for the agency. I know when you testified before our Energy and Power Subcommittee, you presented some recommendations which we supported for increased staffing, for technicians and inspectors, and across-the-board increases for the agency. I just wonder, in light of the fact that the appropriation bills individually may not be enacted for quite some time, whether or not you feel you have adequate staffing now for the inspections and for all of the other work in which the agency is involved, particularly in light of its attempt to expand its capability in order to apply the lessons learned from Three Mile Island.

What is the status right now, and what is your view of the future in that respect? That is, the near-term future.

Mr. AHEARNE. Well, I think that if we don't get approval of the increased staffing, particularly in the areas of inspection and enforcement and reactor regulations that we had asked for, and as you've mentioned, had been tentatively approved, that we will begin facing increased problems going into the fall and early spring on staffing adequately the inspector sites and in continuing with the licensing reviews that we are now committed to—as I was mentioning to Mr. Lent—that we are turning our people to.

As more plants come into the stage where we want inspectors there, as more plants get ready for the licensing review, we need to have the qualified people. Part of our problem is that we can't instantaneously hire the kind of individual that we can use in these spots. They are hard to find, and once found, there is still a period of training in the regulatory philosophy, in the regulations and regulatory approach if necessary, before you can turn those people on.

As I testified in other places, the requests that we had put in were, I felt, tight, but adequate, but not being able to meet those, clearly, things will have to slip, and what will end up slipping are the staffing of the inspector slots and also the licensing reviews. There is no way we can avoid that.

I would point out that I'm glad to hear you at least talk about a continuing resolution. There is another alternative which is even more drastic and would be a lot harder to do adequately.

Mr. CORCORAN. Well, there is a continuing resolution that has passed the House and presumably will pass in the Senate, hopefully without too many changes, especially with respect to its terminus.

But be that as it may, are you familiar with that continuing resolution? As you know, in general, when we've had continuing resolutions, they are at the current budget level. In this particular case, the continuing resolution is, from the standpoint of the House at least, at the level of the appropriations bills that have passed the House this year for the coming fiscal year.

In that event, it would seem that we could expect your agency to be funded under the continuing resolution at the level of the fiscal year 1981 appropriation bill. Do you know whether or not that is the case?

Mr. AHEARNE. No, Mr. Corcoran, I don't. I know that the House appropriation action was less than what the Senate appropriation action was. The Senate has added additional spaces for Mr. Stello's office.

Mr. CORCORAN. I would appreciate it if, as one of the byproducts of this hearing, I could learn from you through your staff the impact of the continuing resolution on your agency.

Mr. AHEARNE. We'll get back to you on that shortly.

[The following information was received for the record:]

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

OCT 16 1980

MEMORANDUM FOR: The Record

FROM: John F. Suermann JFS
Office of Congressional Affairs

SUBJECT: INFORMATION FOR THE RECORD - SEPTEMBER 23, 1980 HEARING ON THE SOUTH TEXAS PROJECT

On page 43 of the unedited hearing transcript Representative Corcoran requested to know what impact the continuing resolution for FY'80 would have on NRC (NOTE: at the time of the hearing neither NRC's FY'81 appropriation bill nor the continuing resolution for FY'80 into FY'81 had been passed).

By the time the hearing transcript was received at OCA on October 3 for editing and compilation of material for the record, the NRC had received its FY'81 appropriation due to H.R. 7590 being signed into law (P.L. 96-367) on October 1, 1980. Mr. Corcoran's question, therefore, becomes academic - the continuing resolution does not apply to NRC.

Discussion between myself and Daniel Mattoon in Mr. Corcoran's office (October 15) confirmed that no information need be provided for the record. Mr. Eckhardt's (hearing chairman) general counsel was informed verbally of this development by me and in addition I will submit a copy of this memo, at counsel's request, to him along with the edited transcript.

Mr. CORCORAN. Second, and the only other point that I would like to discuss, would be the issue of the variations that you talked about in your statement as well as in your discussions of the matter with our colleague from Massachusetts, Mr. Markey, about these different approaches that the licensee might have in having one person responsible for construction and another person responsible for the architect/engineering work, and, of course, with the TVA, you would have one entity that's responsible for all three of those functions.

Why are there so many differences when, as you well know, we are not talking about a tremendous number of projects? We have some 72 powerplants in operation now. We have 90-odd powerplants in some stage of process right now before coming on line. Why are there these differences? What is the reason for that?

Mr. AHEARNE. Let me give an initial answer and then I'll turn it over to Mr. Stello or Mr. Thornburg to expand.

There are at least three companies that build their own plants: Tennessee Valley Authority, Duke Power Co. and Commonwealth Edison. That is, they are the constructors. But to construct a nuclear power plant is a very large job, and it requires a very large work force, and I think at that level of action, that's sort of accessible only to the largest organizations. Those three happen to be ones that are heavily committed to nuclear power and so have the ability to have that size work force.

As far as why some companies go on to—such as Houston did—the same company to do both versus two different companies, I'll ask Mr. Stello.

It is my impression that it is the rare company who has had the same organization act as both architect/engineer and constructor.

Mr. STELLO. To amplify some of the comments the chairman has made, I think the reason the utilities arrange to build the plants the way they do is the result of their previous experience prior to going into the nuclear business.

If there were a utility who had a very large engineering office capable of doing their own architect/engineering work, they did so. If they had large construction forces because they built their own plants, then they were inclined also to do so with the nuclear. And that is, indeed, the case in utilities such as Duke Power Co. and TVA and Niagara-Mohawk Power Corp. to a degree.

So the way in which they are going about business now is a product of how they had been going about building their electrical generating facilities in the past. And as I understand it, the way Houston Power & Light made this decision, it is based on their previous experience of how they in fact have gone about the business of building a powerplant. I think it is really history that dictated the way the individual utilities made that decision.

Mr. CORCORAN. Well, I can certainly appreciate that, but it would seem to me that with the use of nuclear power, you are talking about another dimension, so to speak, of the work that's involved in bringing the powerplant on line.

I just wonder, in view of the experience that you have had thus far with the Texas plant, which is the subject of this hearing, would it not be advisable, at least for your agency to review the posture of the agency relative to the company as to whether or not

we would want to approach it along the lines that TVA has done or Commonwealth Edison in Illinois or Duke Power or some of the others, because of the nature of the work that's involved, the size of the work, the quality assurance controls that I think have to be there in order to generate the public confidence that's going to be needed?

I recognize not everybody in this room will ultimately respond to what is done, but I think that, in general, people need to be reassured on these matters and I think that one of the ways perhaps to do that would be to make a change in that respect.

I realize at this point you are not in a position to have a definitive reaction, but I wonder whether or not it's worth reviewing.

Mr. AHEARNE. We are, Mr. Corcoran, reviewing our general philosophy of approach to the management of the design, construction, operation of nuclear power plants, and one of the issues that is to be addressed in that review is whether or not we should require—strongly encourage—that kind of a separation.

I think it is generally true that where we have found problems in the construction, it is because, just as you indicated, there really is a difference. It's a different magnitude when you go to build a nuclear powerplant, and the companies didn't appreciate that.

Mr. CORCORAN. Thank you very much.

Mr. ECKHARDT. Mr. Stello, if you like, we will put your statement in the record in full. You may summarize it and further comment. I know many of the things you have stated in the material you gave me have already been covered.

Would you proceed?

TESTIMONY OF VICTOR STELLO, JR.

Mr. STELLO. Mr. Chairman, what I had proposed, with your permission, recognizing I have a rather lengthy statement, is to try to very briefly summarize my statement, and I could do so very quickly.

Mr. ECKHARDT. Without objection, then, your full statement will be put in the record. [See p. 30.] You may proceed.

Mr. STELLO. OK.

Let me begin back at the start of when we began to see problems at the south Texas site, which began in early 1977, when we received the first of a series of allegations concerning harassment and intimidation of quality control inspectors at the south Texas site.

These allegations were investigated and brought to the licensee's attention. Nevertheless, they continued. The FBI also investigated the allegations and in a letter from the U.S. attorney assigned to the southern district of Texas, dated December 4, 1979, prosecution of this matter was declined.

We continued our investigation and inspection activities and began to intensify our efforts as the allegations persisted. Finally, following a new series of allegations received on November 2, 1979, I decided that an in-depth investigation be made into the continuing allegations of lack of quality control management support and harassment and intimidation of contractor-quality control employees.

I further directed that a comprehensive review of the current effectiveness of the implementation of the quality assurance program be made. This latter directive, as we now know, produced very important results and I will discuss their significance later.

Let me parenthetically note—I see Mr. Markey is gone. He indicated or left the impression of a suggestion that the reason for the comprehensive look at south Texas was the result of some programs that were aired on TV last fall, and I want to emphasize that that decision as to what to do on south Texas was mine, and it was not a result of the TV program, but the persistence of the allegations that were coming to us as a result of our assigning a resident inspector to the south Texas site in September of that year.

I designated the Director of the Division of Reactor Construction Inspection in my office as the individual responsible for forming a multidiscipline investigating team. The team consisted of six members selected from various NRC regional offices and included the resident inspector assigned to the south Texas site.

Utilizing inspectors from other regions provided not only a fresh look at the problems, but increased the technical expertise in the problem areas of concrete instructors. Also, I expected the special investigation team to obtain a broader, integrated view of the quality assurance program at the site than that previously obtained from individual inspections.

Furthermore, I was impressed by the results of a team inspection approach that we had recently conducted at the Marble Hill site during the summer of 1979. As you will recall, Marble Hill also had significant quality assurance problems.

This special investigating team conducted its work between November 1979 and February 1980. Results of this investigation substantiated a large number of allegations and found that quality control inspectors were harassed, threatened, and intimidated; production pressures on the quality control inspectors were found; welder qualifications and weld quality were marginal in several instances; the quality assurance audit system was found deficient. Disposition and handling of quality nonconformance reports was inadequate.

These difficulties in the quality assurance program caused us to conclude that an order containing a number of elements, as listed on page 7 of my prepared statement, as well as a civil penalty were needed.

This order was issued on April 30, 1980.

On July 29, we received the licensee's response to our order to show cause. The response addressed each of the issues from the order and provided details of corrective action already taken or planned to be taken.

Following initial review of the response by my staff, we conducted a public meeting on August 19, 1980 at Bay City, Tex., with the licensee, Brown & Root, the public, myself and others from the NRC staff in attendance. We asked the licensee and Brown & Root many questions and requested clarifications regarding the information contained in the response to our order.

Many members of the public asked questions and many of these required responses by the NRC attendees. A transcript was made of

this meeting and a copy has been provided to the subcommittee staff and, the earlier comments by Mr. Markey I assume were taken from that transcript.

In addition to these formal actions, I personally visited the south Texas site with other members of the staff and spent a day inspecting completed and ongoing construction activities and talking to workers and quality assurance inspectors.

Based on the response to our order, the public meeting, and what I have heard from both management and workers, my overall impression is that there has been a turnaround in attitude with regard to quality control at south Texas.

The following commitments by the licensee and Brown & Root exemplify this attitude change:

One, the organization changes have been made to more directly involve senior management in quality assurance. For example, the licensee's executive vice president has been relieved of other responsibilities to spend virtually full time on the south Texas project. He has personally committed to be at the site about twice each week. The manager of quality assurance has been relocated from Houston to the site and reports directly to the executive vice president.

Two, policy has been changed to assert the independence of quality assurance personnel from considerations of cost and schedule. For example, Brown & Root has reshaped its worker indoctrination program to emphasize the preeminence of quality. This emphasis shift was also evident in people at the site that was observed when I visited the site prior to the public meeting.

Three, additional people with increased capabilities have been assigned to the quality assurance program. For example, the licensee staff in this area has been increased by six specialists with an average of 10 years' experience in the field. The Brown & Root quality assurance manager——

Mr. ECKHARDT. Mr. Stello, we will have to recess a moment to answer the roll of the main committee. We will come right back.

[Brief recess.]

Mr. ECKHARDT. The subcommittee will resume.

Mr. Stello?

Mr. STELLO. Shall I begin where I left off, Mr. Chairman?

Mr. ECKHARDT. Yes.

Mr. STELLO. The Brown & Root quality assurance manager has been replaced with a consultant who has had 20 years' experience. Organization changes have been made to provide stronger licensee direction of quality assurance and increased Brown & Root engineering direction of quality assurance activities.

Corrective action is being taken to correct specific quality assurance weaknesses such as poor procedures, inadequate qualification of inspectors, inadequate audits, and failure to use trend analysis to aid in identifying quality problems.

In addition to the major issue of quality assurance attitude and performance, the licensee has taken action to correct specific problems in safety-related work, such as concrete and welding. In this regard I see no evidence of a reluctance to check previously completed work.

For example, the licensee has committed to reinspect all accessible completed structural welds with reinspection of inaccessible welds to be determined based on results. The licensee is also uncovering a significant quality of buried class 3 piping for reinspection.

In the testimony prepared in anticipation of a July hearing by your subcommittee I indicated on page 5 the possible unanswered safety question with regard to buildings' foundation as a result of our findings based on the licensee's documentation.

As a result of additional field investigatory work and actual field samples, including borings and some additional analytical work, it appears there is not a major problem.

We still have some areas to clarify and to obtain and review a final report from the licensee addressing soils and foundations. Our final assessment will follow that effort.

In summary, the licensee has taken many corrective actions and made a number of commitments yet to be completed. We are tracking these and region 4 inspectors are verifying the actions at the site.

Safety-related work will be restarted in segments as required commitments are completed, with the licensee obtaining our concurrence for each work segment.

With the licensee and contractor performance record that led to the cessation of safety-related work at south Texas, we intend to demand that all commitments be met. However, with the revised approach in attitude being demonstrated by those responsible for the south Texas plant, I am consciously optimistic that they can complete the project in conformance with the construction permit.

Returning to a point I made earlier, our experiences with the south Texas project and the Marble Hill facility suggest that a revision to our construction inspection process may be useful. Specifically, the concept of an integrated multidisciplined team approach to inspection rather than individual inspection activities over an extended period of time needs to be considered for other projects.

The team approach will feature use of an integrated multidiscipline team, increased emphasis on observing ongoing work at the site, emphasis on licensee and contractor management effectiveness in terms of management of the quality assurance function, increased emphasis on interviewing workers and inspectors, and increased emphasis on integrated review of inspection results in terms of quality assurance program implementation.

As I indicated earlier, we are having a meeting to discuss just such an approach later today and hope to be implementing it on a trial basis in the near future.

Mr. Chairman, that concludes the summary of my testimony. I assume that my prepared remarks can be entered into the record fully.

[Testimony resumes on p. 48.]

[Mr. Stello's prepared statement and addendum follow:]

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STATEMENT OF

VICTOR STELLO, JR., DIRECTOR
OFFICE OF INSPECTION AND ENFORCEMENT
U. S. NUCLEAR REGULATORY COMMISSION

I. Chronology of Events Leading to Identification of Current Problems

The Construction Permits for the South Texas Project were issued by the NRC on December 22, 1975. As part of this initial licensing process the planned quality assurance program had been reviewed and was considered acceptable to the NRC.

After construction was started and during the next several years, my office carried out its normal construction inspection program utilizing inspectors from our Region IV office. The inspection records for that time showed no extraordinary problems.

Then in early 1977 we received the first of a series of allegations concerning harassment and intimidation of quality control inspectors at the site. Each of these allegations was investigated by my people, and most were not substantiated.

However, due to the persistent nature of these allegations, in August 1978 the Director and staff of Region IV held an enforcement-oriented management meeting with the licensee. The allegations received and investigated to date, as well as other concerns relative to implementation of the licensee's quality assurance program, were discussed.

About a month later, on September 15, 1978, we stepped up our enforcement action by issuing an Immediate Action Letter to the licensee confirming the licensee stopping all work involving installation of concrete

reinforcing steel due to deficiencies our inspectors had reported in the splicing of this steel. We issued another Immediate Action Letter the following May due to improper storage of concrete reinforcing steel. Then in June 1979 we issued the first of three Immediate Action Letters concerning voids in safety-related concrete structures after the licensee had stopped work in this area due to quality assurance problems.

During this period, in the Spring of 1979, an allegation was received at the Houston, Texas, Office of the FBI regarding possible conspiracy to defraud the United States Government through the NRC. It was alleged that officials of Brown and Root, Inc., Houston Lighting and Power Company, and the NRC were involved in the conspiracy.

The FBI performed an investigation of the allegation. Subsequently, J. A. "Tony" Canales, United States Attorney, Southern District of Texas indicated in a letter to the NRC's General Counsel dated December 4, 1979 that prosecution was declined in this matter.

Meanwhile, because of our increasing concern with quality assurance problems at South Texas, we decided to conduct what is called our midterm quality assurance inspection earlier than usual. This inspection was conducted in August 1979 by a group consisting of Region IV and Headquarters personnel. This inspection indicated quality assurance deficiencies in the areas examined - including examples of one subcontractor failing to follow quality assurance procedures and failing to conduct site audits as required.

In September 1979, we assigned a Resident Inspector to provide a continuous NRC presence at the site. On November 2, 1979 a new series of allegations was made to our Resident Inspector. These allegations addressed threats, harassment and intimidation of quality control inspectors by construction personnel and lack of management support for quality assurance functions.

The following day, on November 3, 1979, I directed that an in-depth investigation be made into the continuing allegations of lack of QC management support and harassment and intimidation of contractor quality control employees. I also directed that a review of the current effectiveness of the implementation of the quality assurance program be made. This action was taken on the basis of the seriousness and the persistence of the allegations and was consistent with the views of the Director of the Division of Reactor Construction Inspection and the Director of Region IV.

When I directed that a special investigation be performed, I designated the Director of the Division of Reactor Construction Inspection in my office as the individual responsible for forming a multi-discipline investigation team. The team consisted of six members selected from the various NRC regional offices and included the Resident Inspector at South Texas. Utilizing inspectors from other regions provided not only a "fresh look" at the problems, but increased the technical expertise in the problem areas of concrete and structures. Also I expected the special investigation team to obtain a broader, integrated view of the quality assurance program at the site than that previously obtained from individual inspections.

II. Results of Inspection by Special Investigation Team

The special investigation team conducted its work between November 1979 and February 1980. Their work resulted in substantiation of a large number of the allegations.* Several instances were confirmed by formal statement that contractor quality control inspectors had been harassed. Several instances of threats and intimidation were also confirmed through statements. Evidence that production pressures were brought to bear on contractor quality control inspection was also obtained through statements. Finally, evidence of nonsupport of contractor quality assurance personnel by their supervision was also confirmed. These findings are considered to be instances where the independence of the quality assurance function was lost contrary to the requirements of the Commission's quality assurance requirements of 10 CFR 50, Appendix B.

In addition, significant quality related deficiencies were found in the following work activities:

1. The quality of safety significant plant backfill in certain plant areas was deficient.

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* It should be noted that the team took 57 statements under oath and that approximately 50 less formal interviews were conducted during the investigation. Previous investigations had not utilized sworn statements.

2. In several instances welder qualification and weld quality were found to be marginal.

3. The system for proper disposition and handling of quality nonconformance reports was found to be inadequate.

4. The quality assurance audit system was found to be deficient.

5. A number of other quality-related items were identified for followup and resolution.

As a result of the special investigation there were few direct indications of reduction in the safety capability of the facility to an unacceptable level. No unacceptable systems, components or structures were found during the investigation of the allegations. However, the investigation did reveal the possibility of problems related to the compaction of engineered fill material supporting safety-related buildings. Major questions related to this aspect of plant construction were noted as requiring resolution, leaving this one issue of adequate safety unanswered with regard to foundations.

Also during the investigation it was found that improper welder qualification testing had been used. Whether this has resulted in safety defects is a question that is to be addressed by the licensee in the actions which we have requested.

III. Civil Penalty and Order of April 30, 1980

As a result of the findings from the special investigation, I issued a Notice of Violation with civil monetary penalties in the cumulative amount of $100,000 on April 30, 1980. In addition, I issued an Order To Show Cause, effective in 90 days, why the safety-related construction activities at the South Texas Project should not be stopped and remain stopped until certain specified actions had been completed.

The examples of harassment, production pressure, lack of management support, threats, and intimidation were used in finding the licensee in violation with Criterion I of 10 CFR Part 50, Appendix B. This criterion deals with the quality assurance organization and the need for this organization to have sufficient authority and organizational freedom to identify quality assurance problems. The organization should also be free from cost and schedule pressures.

Twenty other noncompliances related to the quality assurance criteria of Appendix B were also cited for civil penalty. These included requirements for 1) design control, 2) instructions, procedures and drawings, 3) document control, 4) control of special processes, 5) inspection, 6) test control, 7) nonconforming materials, parts or components, 8) corrective action, 9) quality assurance records, and 10) audits.

Another item of noncompliance, related to the use of improper techniques in welder qualification tests, was also cited in the civil penalty action.

The Order to Show Cause requires the licensee to address the problems and poor quality assurance situation that were found to exist, and to assure that completed work meets all necessary requirements. In the Order, I specifically directed the licensee to complete eleven (11) actions to permit me to evaluate whether future activities at the South Texas Project will be conducted in accordance with Appendix B of 10 CFR Part 50. Those actions are as follows:

1. Have a review conducted by an experienced, independent management consultant, knowledgeable in QA/QC and nuclear construction, of the licensee's management of the quality assurance program to evaluate the current program and provide any recommendations for improvement.

2. Complete a review of existing information or obtain new data in order to address five specific safety issues related to Category I structural backfill.

3. Conduct a review of completed on-site safety-related welding in the civil-structural and piping work to determine its acceptability.

4. Rescind a Brown and Root brochure related to the QA Program and issue a new brochure. A video tape used in training sessions was not to be used in the future and new training sessions are to be held.

5. Define more clearly the procedures associated with the stop work authority in the quality group.

6. Develop and implement a more effective system to provide for the identification and correction of the root causes for the nonconformances which occur.

7. Develop and implement a more effective system to provide for the control of field changes in order to assess the impact of design changes on the design with respect to safety.

8. Develop and implement a more effective system of record controls.

9. Develop and implement an improved audit system.

10. Verify and correct Final Safety Analysis Report statements related to soil foundations.

For all of the above items the licensee was ordered to submit in writing, under oath, information addressing actions taken.

11. Participate with senior representatives of Brown and Root in a public meeting near the site, with the NRC.

In summary, I concluded that the quality assurance program at the South Texas Plant had significant deficiencies. I also concluded that the

quality assurance program had become impaired in the sense that several lines of defense in the quality assurance program had been seriously breached; viz. quality control inspection in the civil engineering discipline through loss of independence, improper disposition of nonconformance reports, and deficient audits. In addition significant questions were raised in the areas of plant backfill and welding and welder qualification.

The ultimate responsibility for loss of independence of contractor quality control inspectors must be placed with the licensee. The inspection function in the civil engineering area must surely have been impaired through the relationship that the licensee allowed to exist between contractor quality assurance personnel and construction workers. In our experience there is much "give and take" among quality control people and construction workers, but the South Texas situation appears to have exceeded the norm.

In further consideration of the findings of this investigation and the results of previous inspection, we believe that the licensee (Houston Lighting and Power) and its principal contractor (Brown and Root) have not been in sufficient control of the South Texas Project. The matter of independence of contractor quality assurance inspectors and the other matters related to quality assurance program implementation are clearly matters controllable by management. I want to emphasize that we do not wish to place blame on the inspectors or on the workers.

Because of the significance of the findings of this investigation in terms of implementation of the quality assurance program at South Texas, we initiated higher threshold enforcement action. A civil penalty was considered to be the appropriate sanction in this case because the most critical work has been stopped and will remain stopped until we are satisfied that proper corrective action has been taken.

The Show Cause Order should provide the means to achieve corrective actions and to assure that the licensee proceeds with improved methods of project control.

IV. Licensee Responses/Actions to the Notice of Violation

The Notice of Violation issued on April 30, 1980 prescribed that the licensee had twenty-five (25) days to respond. The licensee responded in a letter dated May 23, 1980 with payment of the $100,000 civil penalty and an admission that "the items of noncompliance, as we understand them are essentially substantiated." In addition to a denial or admission for an item of noncompliance a licensee in responding to this type of Notice of Violation is required to provide (1) the reason for each item of noncompliance; (2) the corrective steps which have been taken and the results achieved; (3) corrective steps which will be taken to avoid further items of noncompliance; and (4) the date when full compliance will be achieved.

The licensee satisfactorily addressed all of the twenty-two (22) items. A complete response in some instances was deferred, to become part of the licensee's response to the Order to Show Cause, due today July 29, 1980. This was considered to be satisfactory based on the licensee's commitment in the May 23, 1980 letter to devoting great attention to attacking the root causes of the items of noncompliance. We interpret this to mean a systematic approach which would: 1) determine the cause of each problem and 2) establish corrective actions to remedy unacceptable results and eliminate the discovered cause. This represents a change to the apparent past approach of numerous minor or "band aid" fixes which most instances would remedy an apparent result, but not the root cause of the problem.

My letter of June 11, 1980 acknowledged the licensee's submittal of May 23, 1980 and the meeting that was held in my office on May 30, 1980 with the licensee to clarify certain aspects of that response. In my letter I expressed certain concerns about their activities and stated the following:

> "We note that the proposed corrective and preventive actions predominantly involve additional or revised procedures and instructions. Although our inspectors identified a few cases of inadequate procedures, the principal finding was the failure on the part of both Houston Lighting & Power and Brown & Root personnel to effectively implement the in-place QA/QC programmatic requirements. In our follow-up inspections we will be

concentrating not only upon the adequacy of procedures and instructions but also upon the effectiveness of their implementation."

V. Meetings with Licensee

In preparing to respond to the specific items of the Order previously discussed, the licensee requested meetings in order to clarify certain aspects of the Order. During the month of June several meetings were held between Region IV and the licensee.

Then on June 30, 1980, a meeting was held in my office at the request of the licensee. The purpose of the meeting was to provide me with an overview of the actions taken to date by the licensee. Brief summaries of the studies made for the licensee were presented as well as some organization charts reflecting changes being made within the licensee's organization as well as that of Brown and Root. One of the statements arising from the discussion is worth mentioning here. In explaining their past problems, the licensee indicated that its QA function had been reduced to a QC group looking at the control of specific items and responding to those specifics rather than performing as a total overview group, analyzing and assessing the total picture.

The most recent meeting, held on July 3, 1980, in Region IV, involved discussion of basically the same items discussed in my office on June 30, 1980.

As I noted previously the response to the Order is due today, July 29, 1980. Even if it has been received in our offices, I obviously cannot address its adequacy at this time. I believe, however, that my actions in this enforcement case are achieving results and I have seen some serious reassessment on the part of the licensee and Brown and Root. It remains for the NRC to review the documents to ascertain whether such problems are likely to arise again, but more importantly, to continue its inspection effort to assess the actual effects in the field as implementation occurs.

My office will be reviewing the licensee's submittal in the immediate future to evaluate the response. The results of that evaluation and any related follow-up will, of course, be a matter of public record.

VI. Other Items - Current Status

As a result of the Show Cause Order which I issued on April 30, 1980 several groups and individuals have requested a hearing on the Order. The most substantive is a filing, dated May 28, 1980, from Mr. Lanny Sinkin, Co-coordinator for the Citizens Concerned About Nuclear Power, Inc. and the Citizens for Equitable Utilities. On June 24, 1980 the staff made a filing before the Commission recommending that the request for hearing not be granted because 1) the Show Cause Order did not adversely affect Mr. Sinkin's interests and, 2) an operating license hearing was to be held in the near future. I am unaware of any new developments on this matter.

The public meeting required by the Order is to be held on August 19, 1980 at the Municipal Service Center located at 2105 M Street (7th and M) in Bay City, Texas. That meeting will be conducted in two sessions. The first session will convene at approximately 2:00 p.m. and terminate at 5:30 p.m. At this session the staff will meet with the licensee with the public present to discuss outstanding issues and to obtain further information to evaluate the licensee's response to the Show Cause Order. The second session will be open for public participation on the issues of the April 30, 1980 Notice of Violation and Order to Show Cause. This evening session will convene at 7:00 p.m. and is intended to be an open session on nuclear power in general in order for the NRC to respond to questions from members of the public. The evening session will continue as long as necessary to accommodate constructive communications.

VII. Analysis of Problem and Generic Implications

In retrospect I wish we could have recognized the problems sooner. However, the information we currently have indicates the facility has been constructed in such a manner that major corrective construction work is not likely to be required. This, of course, must be confirmed.

The stoppage of work in many safety-related areas that has been in effect and remains in effect has permitted an examination by the licensee of that construction already completed. It has also allowed time to reassess the past with regard to the quality of the work and to plan for future improvements in areas noted to be weak based on the past experience.

Our experience at South Texas has increased our awareness to the possibility of similar problems in quality assurance at other construction sites. If similar circumstances arise again at another site, we should be able to react more quickly in order to obtain corrective action.

VIII. Projection of the Future Construction of the South Texas Project

In my opinion, there is no reason to expect that the South Texas Project cannot be safety constructed, tested, licensed and operated. Certainly when problems arise of the magnitude of major quality assurance program deficiencies there will be time delays in order to reassess and correct problems. There will no doubt be problems during future construction at South Texas and there may be new safety issues that arise that will have to be addressed, but it is my opinion that the plant can be constructed to meet our requirements and that it can be operated without undue risk to the public.

ADDENDUM

The previous portion of my statement was prepared for presentation to you on July 29, 1980. Since that time a number of actions have taken place which are of importance to the South Texas Project.

On July 29 we received the licensee's response to our Order to Show Cause. The response addressed each of the issues from the Order and provided details of corrective action already taken or planned to be taken.

Following an initial review of the response by my staff, we conducted a Public Meeting on August 19, 1980 at Bay City, Texas with the licensee, Brown and Root, the public, myself and others from the NRC staff in attendance. We asked the licensee and Brown and Root many questions and requested clarifications regarding the information contained in the response to our Order. Many members of the public asked questions and many of these required responses by the NRC attendees. A transcript was made of this meeting, and a copy has been provided to the subcommittee staff.

In addition to these formal actions, I personally visited the South Texas site with other members of the staff and spent a day inspecting completed and on-going construction and talking to workers and quality assurance inspectors.

Based on the response to our Order, the Public Meeting, and what I have heard from both management and workers, my overall impression is that there has been a turnaround in attitude with regard to quality control at South Texas. The following commitments by the licensee and Brown and Root exemplify this attitude change:

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1. Organization changes have been made to more directly involve senior management in quality assurance. For example, the licensee's Executive Vice President has been relieved of other responsibilities to spend virtually full-time on South Texas. He has personally committed to be at the site about twice each week. The Manager of Quality Assurance has been relocated from Houston to the site and reports directly to the Executive Vice President.

2. Policy has been changed to assert the independence of quality assurance personnel from considerations of cost and schedule. For example, Brown and Root has reshaped its worker indoctrination program to emphasize the preeminence of quality. This emphasis shift was also evident in people my staff and I interviewed at the site.

3. Additional people, with increased capabilities, have been assigned to the quality assurance program. For example, the licensee's staff in this area has been increased by six specialists with an average of 10 years' experience in the field. The Brown and Root Quality Assurance Manager has been replaced with a consultant who has had 20 years' experience.

4. Organization changes have been made to provide stronger licensee direction of quality assurance and increased Brown and Root engineering direction of quality assurance activities.

5. Corrective action is being taken to correct specific quality assurance weaknesses such as poor procedures, inadequate qualification of inspectors, inadequate audits, and failure to use trend analysis to aid in identifying quality problems.

In addition to the major issue of quality assurance attitude and performance, the licensee is taking action to correct specific problems in safety-related work such as concrete and welding. In this regard, I see no evidence of a reluctance to recheck previously completed work. For example, the licensee has committed to reinspect all accessible, completed structural welds with reinspection of inaccessible welds to be determined based on results. The licensee is also uncovering a significant quantity of buried class III piping for reinspection.

In summary, the licensee has taken many corrective actions and made a number of commitments yet to be completed. We are tracking these, and Region IV inspectors are verifying the actions at the site. Safety-related work will be restarted in segments as required commitments are completed with the licensee obtaining our concurrence for each work segment.

With the licensee and contractor performance record that led to the cessation of safety-related work at South Texas, we intend to demand that all commitments be met. However, with the revised approach and attitude being demonstrated by those responsible for the South Texas plant, I am cautiously optimistic that they can complete the project in conformance with the construction permit.

Mr. ECKHARDT. That is correct.

Mr. Stello, I have a letter dated April 2, 1975, from the Office of Inspection and Enforcement, Region 4, of the Nuclear Regulatory Agency, which seems to point out these matters as they came up at that time. It says:

> During the inspection it was found that your quality assurance program was deficient in that certain activities appeared not to meet the requirements of Appendix B to 10CFR50 of the NRC regulations quality assurance criteria for nuclear power plants. The items and references to the pertinent requirement are identified in section 1 of the summary of the enclosed report.

Your agency there was referring to what later developed as more or less the crux of the problem even at that time; is that not correct?

Mr. STELLO. In general, yes.

Mr. ECKHARDT. Mr. Seyfrit, of your agency, in discussing the task ahead for Houston Lighting & Power Co. has recently stated—and that is after the hearings in the development of matters as they exist today—and I quote:

> There are a great many things that have to be done and the chore of getting these things done is an awesome one, both for the licensee, his contractor, and for us.

I assume that really is not in dispute—that it is an awesome task, is it not, and might be a costly one?

Mr. STELLO. It certainly is going to be a large effort. I do not know that I would adopt the word "awesome." It is going to take a great deal of work on behalf of the licensee and on our behalf. I believe that commitment to do the work has been made. As far as what the cost of the activity will amount to, I really have no way of judging.

Mr. ECKHARDT. A moment ago Mr. Markey referred to something like 60 out of 70 welds being found deficient. I understand those were generally pipe welds, things of that nature; were they?

Mr. STELLO. I believe they were structural welds.

Mr. ECKHARDT. Cadwelds?

Mr. STELLO. No, structural steel.

Mr. ECKHARDT. In addition to that, there are a number of Cadwelds, some of which are now embraced within the concrete structure, are they not?

Mr. STELLO. The weld deficiency that Mr. Markey referred to earlier was welds that were made in structural materials, structural steel. The kinds of problems that are identified were weld spatter, that kind of activity which did not pass the visual. That might mean welds will have to go back and be ground out. It is conceivable that there might be the need to replace a weld if it in fact is deficient.

The concept of it being bad in terms of having to go in and grind out the complete weld and replace it does not appear based on what we have seen to be the kind of difficulties associated with the welds that were being described earlier.

There was a problem associated with records for certain of the Cadwelds earlier in the project which came up for discussion. These had to do with the record process identifying where certain Cadwelds were placed in the facility after they were fabricated, the existence of them.

There is no need to have the knowledge as to where they are, only to confirm that the proper approach was used in fabricating the Cadweld.

Mr. ECKHARDT. In these 70 welds in which 60 were found somewhat defective, some 30 of those you found required rewelding, did they not?

Mr. STELLO. I would have to ask Karl Seyfrit if he happens to have the figure?

Mr. SEYFRIT. I don't have that with me.

Mr. ECKHARDT. I think that is from the testimony of Brown & Root at the proceeding last month.

Let me put it this way: You did find a number of defective welds that could be examined and a number of those required either grinding down and further repairing the weld or rewelding; is that not correct?

Mr. STELLO. Yes, generally.

Mr. ECKHARDT. There are other welds which are now inaccessible, some even covered by concrete; is that not correct?

Mr. STELLO. Yes, some of the structural welds would be in inaccessible locations which could mean they were physically in concrete structures.

Mr. ECKHARDT. What can be done to determine whether those were properly done now?

Mr. STELLO. The first thing we want to do is to take a look at the results of the reinspection of all of the welds to make a judgment as to whether these welds really, truly create a structural problems in terms of their integrity as to where they are.

The sample that is going to be taken is obviously as large as one can take. All of the accessible welds are to be reinspected, so we will be able to make a fairly sound judgment as to what the likely status of the welds that are inaccessible are. If a judgment is made that this, in fact, is questionable from a safety standpoint, then that would have to be corrected.

Mr. ECKHARDT. That would be at considerable cost, I think we could say without equivocation, can't we, if the weld is encased in concrete and has to be chipped out and rewelded? I do not think I am trying to ask you a question where there is not more or less in agreement.

Mr. Grote of Brown & Root said when it comes to construction, and I quote him: "It is cheaper to do it right the first time." It seems so obvious that if welds have to be redone and some of those welds may not be presently accessible and access must be obtained to them, that there is a much greater cost in doing it a second time than it would be to do it right the first time.

Mr. STELLO. I could not agree more with that philosophy.

Mr. ECKHARDT. Do you also agree, as Mr. Grote states, that rework costs are measurable, that is, that you can determine what the rework costs are as opposed to what it would have cost to have done it right the first time?

Mr. STELLO. Yes.

Mr. ECKHARDT. If you believe that rework costs are measurable and that the failure to assure the presence of an adequate quality control program is a reflection of mismanagement, there then arises a question as to what extent should ratepayers bear the cost

of something that should have been done the right way the first time.

This is a question that I am very concerned about because the question is: Shall the ratepayers in the manufacture or in the making of an atomic plant bear the risks of mismanagement and of faulty quality control or should that cost be absorbed by the utility? Furthermore, should the utility be able to recover from the contractor that made the mistake the first time? All of these questions seem to me to be very crucial social questions.

I am asking this not with respect just to the southwest plan. I am not asking what should be done there. I am asking this as a policy question. The questions I am asking here are totally hypothetical.

The point is, though, that we have to make some policy determinations from not only that which happened down there but that which may have happened or which is sufficiently probable to give us the duty of attempting to solve some of these social questions.

Mr. AHEARNE. Mr. Eckhardt, that is a relatively significant policy question which the Commission has previously addressed in a different context. In the past the Nuclear Regulatory Commission has been unable to reach a position to say where any such costs ought to be absorbed.

What we have so far done is to point out that what ratepayers are exposed to is a matter for the ratemaking organizations—the utility commissions. We identify to the utility commissions when we take action against a licensee and what information we develop.

The Commission has not reached a position as to who should bear that cost.

Mr. ECKHARDT. Clearly, it is a matter—it should be a matter—of great concern. I understand it is a matter of great concern in this particular case to the Texas Public Utility Commission. They are looking into the question now. I think that gives us an example of what may exist in every State.

However, there is a problem here. This is a highly technical type of operation. I think you know as well as I do that public utility commissions frequently have enough difficulty in dealing with the extremely sophisticated knowledge of utilities themselves with respect to ordinary ratemaking.

When we move into a field involving this very highly technical and very new area, it seems to me there is an special duty on the Federal Government to look into these questions and aid the utility commissions from the experience obtained by your agency. Would you agree to that?

Mr. AHEARNE. I personally agree with that. The Commission, as I tried to express, has not reached a conclusion as to what level of involvement we ought to have in the ratemaking.

Mr. ECKHARDT. That is also a policy question that I think this committee and Congress needs to address.

I, for one, feel that unless we work out some policy in this area, we simply encourage an extremely costly development of energy in this country which may be done extremely inefficiently because in a mad race toward obtaining energy from sources different from the traditional fossil fuel sources, we may find utilities and con-

tractors oblivious to costs as long as they may pass that cost on to ratepayers.

If it is passed to ratepayers at the same rate all over the country and between different utilities, there is no skin off their nose if the operations are highly inefficient and result in enormous cost overruns. That is the concern I have about this question in addition to the question of safety.

Can you give us any indication of what the Commission is doing or planning concerning this question of the responsibility for negligent activity which may result in higher rates to consumers?

Mr. AHEARNE. As one of the results of the review of Three Mile Island, we had addressed what kind of action ought we to take in regard to utility commissions. We had reached the conclusion we ought to at least inform of any actions we take with respect to a licensee and what the results of the reviews are.

I have asked the general counsel recently to address in the particular instance the sort of general policy question of what we ought to do in the way of regulatory actions by the PUC's, this issue accelerated by Three Mile Island and Metropolitan Edison in its concerns.

Mr. ECKHARDT. The thing I am getting at is if the utility may make a contract with a contractor without bringing into consideration of the terms of the contracts the Public Utilities Commission or the public, the result may be that the contractor will make a lesser cost estimate, construct the plant in a less efficient way in the long run, if that contract does not have to bear the responsibility of his own negligence. The utility more or less in cahoots, so to speak, with the contractor passes these costs on to the public.

It seems to me that should be a paramount concern to your agency.

Mr. AHEARNE. Mr. Eckhardt, I think a paramount concern to my agency is that plants, if constructed, are constructed correctly and then, if operated, operated correctly. Our concern really has to be to insure that the public health and safety is protected. The aspect of what is the most economic means of reaching that, at least at the present time, isn't a conclusion that the Commission has reached as to our responsibility.

Mr. ECKHARDT. Who is concerned with that? Who at the Federal level is concerned with producing energy at a reasonable and economical price? Is the DOE concerned with it?

Mr. AHEARNE. I would have thought that the Economic Regulatory Administration in the DOE would be a more appropriate location for that kind of concern.

Mr. ECKHARDT. What consultation or what cooperation do you have with that agency, if any?

Mr. AHEARNE. The level of consultation that we have with them is primarily in addressing the need-for-power question in regions of the country: How much power is needed? What is the impact on a plant not ready or a plant being shut down?

Mr. ECKHARDT. That is just the problem I have. Who is watching the store with respect to cost? DOE is pressing as hard as they can for more generation of energy. Your agency is concerned about giving assurance to the public that nuclear energy is going to be produced in a safe way. Who is watching the store?

I understand that the Texas Utility Commission was planning to delve into this question and have a report on the matter and that this was recommended by their counsel. However, I understand that has been rejected by the Texas Utility Commission. We intend to hear that question, too.

I am very, very much concerned about everyone going pell mell for more energy regardless of the cost. That is the concern I have in this issue.

I hope your agency and DOE and whatever other Federal agencies are concerned with the problem can work out some means of coordinating your efforts in this direction.

It seems to me it is closely tied to the technical questions that you have raised here.

Mr. AHEARNE. I agree that they are very much intertwined. As I said, I think we ought to be sharing our information with regulatory commissions.

I would have to comment that, as I think underlie many of Mr. Lent's questions, my agency is not normally characterized as one pell mell for producing more energy.

Mr. ECKHARDT. Well, I was not necessarily referring to your agency. I think DOE has been inclined in that direction. Perhaps this is a syndrome of our times.

Mr. AHEARNE. I do believe that the utility groups, the utility commissions, are the places that the public should be looking for the balancing of cost and need. They are really responsible for making sure that ratepayers are only paying the amounts that are appropriate.

Mr. ECKHARDT. I have been in a State legislature for 8 years. Of course, we only had one utilities commission in Texas since I have been out of the legislature, but for many years Texas and one other State were the only States that did not have a utilities commission. With respect to my own experience, I think I can say it is extremely difficult for a State agency to deal with the kind of economic units, the kind of business units, they frequently have to deal with without some help from those who have experience nationwide.

Take, for instance, the problem with the A.T. & T. and the Bell System. A public utility commission is puny with respect to its resources as compared to such factors.

When we get into questions that have to do deeply with technological advice, the public utility commission is a baby compared to the utility that they are dealing with and compared to a large contract that operates worldwide like Brown & Root.

Don't you agree that is the case?

Mr. AHEARNE. I don't have enough detailed knowledge of utility commissions to know whether that would be the case, but it sounds reasonable, with the possible exception of California's commission which is very large.

Mr. ECKHARDT. What about Mr. Kahn's shop that is concerned with inflation? Do they come into this question in any way with respect to rates? Do you have any consultation?

Mr. AHEARNE. Not to my knowledge. I don't believe so.

Mr. ECKHARDT. Thank you, sir.

Mr. Lent?

Mr. LENT. Mr. Chairman, I would like to yield to Representative Markey.

Mr. MARKEY. Thank you. I must leave shortly to testify before the Rules Committee.

I would like to call attention to a Newsweek story on Brown & Root's responsibility in the south Texas nuclear project. The article says:

> Meanwhile, the NRC reports, the inspectors got little support from Brown and Root's management. In January, inspectors were lectured on their role in holding down costs and meeting schedules; A brochure reiterating those themes was printed up and distributed in case the inspectors needed a reminder.

The story is really the story of a failure of the quality control program at south Texas which could be repeated again and again at other nuclear powerplants now under construction.

Time delays and cost overruns are a powerful incentive to the utility or the contractor or the architect-engineer to subvert their quality assurance efforts.

I am concerned that there is an inherent conflict of interest in the present system of regulation. Brown & Root employees inspecting Brown & Root workmanship present an example of this inherent conflict of interest. There will be a powerful temptation to cut corners, to cut quality. It is unreasonable to expect that parties with a conflict of interest will be vigilant in maintaining a close watch on safety-related construction quality.

I am not satisfied that under the present regulatory system in which quality control rests entirely in the hands of the licensee we can successfully extinguish the temptation among some licensees to cut vital safety corners during construction.

I would like your response, Mr. Ahearne and Mr. Stello, to the following proposal:

Should the NRC assume responsibility for quality assurance functions at nuclear plants? Is a Federal takeover of the quality assurance program the sole means by which the NRC can guarantee the quality of reactor construction, insure that the quality assurance functions are independent of other plant priorities, and establish a system by which the utilities could finance this Federal quality assurance program in the same manner that they currently pay for their quality assurance offices?

Mr. AHEARNE. Mr. Markey, first, as far as the point you made from the Newsweek story, I think you will also find that was one of the items that was listed in our notice of violation and order to the company. That was one of the exact items that we were very concerned with.

Mr. MARKEY. I do not have any problem with your ability to identify the problem. My problem is what you do after you identify the problem.

Mr. AHEARNE. I understand that.

Mr. MARKEY. That is what I am asking. Now that you identify them, what are we going to do about them?

Mr. AHEARNE. My answer would be no. Not only don't I believe that is the only way, but I do not really believe that would be a good way. That would leave the licensee then to conclude they did not have that fundamental responsibility to insure that the quality control was done adequately.

I do not have any great belief that the Federal Government can automatically be the best at something, nor that a public organization can, because many of our licensees are public organizations. We have problems with utilities that are run by public organizations just as we have problems with utilities that are run by private organizations.

Mr. MARKEY. Mr. Stello?

Mr. STELLO. I do not think the Federal Government being involved would allow me to conclude that the product that one produces is necessarily better or less costly. The concept where the NRC, to use your earlier words, becomes a true watchdog agency and assures that the licensee fulfills his responsibility in constructing and operating a plant of the high quality that it must be is followed, but under no circumstance would I ever want to get to a point where the quality assurance activity of the constructor himself somehow falls out of the picture.

The proper way for the construction to proceed is such that, as was noted earlier, it is built right the first time and that no rework is needed. This means that the very active, dedicated, and energetic commitment to doing a good job in constructing it must be built into the constructor himself. He really needs to have a system to assure himself that the quality of the product is built in the first time. Therefore, no matter what system is chosen, you need to rely on that system as being a good system to begin with in the layers of independent review on behalf of the licensee and the NRC.

Mr. MARKEY. I doubt there is the proper safety incentive built into the present structure. I think the conflicts of interest are so obvious, so patent, that this Brown & Root situation can be replicated across the country.

This is where real in-depth oversight by the Nuclear Regulatory Commission is needed from the outset.

A well-organized, forceful oversight program would not only increase safety, but it would reduce costs. In the long run, by having to go back and rebuild a plant a second time or a third time, each time building in additional millions of dollars worth of costs, we would have been pennywise and pound foolish not to have instituted this kind of program.

Perhaps the accident will not occur here, but I think inevitably we are playing a game of nuclear roulette. It might not be this plant, but sooner or later there is going to be a plant where the conflict of interest and the lack of real safety assurances are going to catch up with us. Where there was no whistleblower within the plant to bring our attention to it. Ultimately, we, as a society, will have to pay a price for it. I think the nuclear industry also will have to pay because their day of accounting is coming unless they are willing to accept responsibility for these kinds of actions.

Thank you, Mr. Chairman.

I thank you two gentlemen as well for your testimony.

Mr. ECKHARDT. Mr. Lent?

Mr. LENT. Thank you, Mr. Chairman.

Chairman Ahearne, I would like to get back to the plant which concerns me, the so-called Shoreham plant to be operated by the Long Island Lighting Co.

I am told by the Long Island Lighting Co. that the Shoreham plant is now about 80- to 90-percent complete. It is scheduled to begin operation in early 1983. The plant will save about 8 million barrels of OPEC oil annually for Lilco which is now, as I mentioned earlier, 100 percent dependent on foreign oil for electric generation.

For every year that this plant's operation is postponed, it adds between $200 and $300 million to its total price tag. In addition, Long Islanders would have to pay about $300 million more each year for the additional oil that would have to be burned if Shoreham were not on line to displace that oil, according to their reports.

I know that you are not prepared to respond about this particular plant now, but I wonder if we could hold the record open and you could give me a little report or give a report for the record on what is the status of that Shoreham plant and what is holding things up, whether it is moving along, and so forth?

Mr. AHEARNE. Certainly, I would be glad to provide that.

Mr. LENT. I appreciate it.

[The following information was received for the record:]

STATUS OF THE SHOREHAM CONSTRUCTION PROJECT

Shoreham received its construction permit in 1973; at the time, a fuel loading date (i.e., receipt of an operating license) was projected for March, 1977. Since then, the projected date for fuel loading has been advanced several times. According to the NRC's "Yellow Book" (Construction Status Report, June 1980), the reasons given by the utility for the delay have included changes in NRC criteria in various areas, labor difficulties, and problems in purchasing and obtaining delivery of materials.

The application for an operating license for the Shoreham nuclear power station is currently being contested. The application is being contested by the following intervenors: New York State Energy Office, Suffolk County, N.Y., Oil Heat Institute of Long Island, Shoreham Opponents Coalition, North Shore Committee Against Nuclear & Thermal Pollution.

The NRC staff licensing manager and lead counsel are presently conducting informal discovery with the intervenors and Long Island Lighting Company (Lilco) to narrow and particularize the contentions. It is estimated that the Safety Evaluation Report will be issued in late December 1980 and this action will initiate the formal discovery period. Assuming a discovery period of normal duration, the operating license hearing would begin in approximately April 1981. It is estimated that this hearing would be completed in late 1981.

The latest projected fuel load date issued by the utility is June–September 1982. In May 1980, an NRC Fuel Load Forecast Panel, composed of personnel from the Offices of Inspection and Enforcement and Nuclear Reactor Regulation visited the site, evaluated the licensee's plans, and estimated a fuel loading date of September 1982.

Mr. LENT. Mr. Stello, as I understand it, the Houston Lighting & Power had never built or contracted for a nuclear power facility before the south Texas project; is that correct?

Mr. STELLO. Yes, sir.

Mr. LENT. How many of these plants had Brown & Root built before this particular one?

Mr. STELLO. The one other major nuclear plant that I am aware of in this country is Comanche. Brunswick——

Mr. AHEARNE. But it is not finished.

Mr. STELLO. Let me get back to the thought I had. Comanche Peak is a facility currently also under construction where Brown & Root is the constructor. They also were involved in the Brunswick facility which is in operation.

Mr. LENT. As the constructor?

Mr. STELLO. Yes; those two come to mind.

The unique feature in south Texas is where Brown & Root serves both as the constructor and the architect-engineer. It is my understanding that is the first time that they have performed both functions.

Mr. LENT. Could you explain why the NRC allowed the partnership of two relatively inexperienced entities on a $1 billion project?

Mr. AHEARNE. Mr. Lent, the regulations that we have, at least currently, do not speak to the interrelationship between those organizations but rather here are the sets of requirements that must be met whoever is the architect-engineer, whoever is the licensee, whoever is the constructor.

For example, with regard to the quality control assurance system that has to be put into place, we have not been able to reach the conclusion that it is only if you have that kind of separation can you provide that kind of a management structure. As I responded earlier, one of the things that we are now reviewing, not driven by south Texas but actually driven by one of the results of the Three Mile Island investigation, is to review what kinds of criteria ought to be in place for the design, construction, and operation of the powerplants.

Mr. LENT. What do you look for in a licensee? Don't you look for experience?

Mr. AHEARNE. In the past what we had looked for in the licensee was a commitment and a proposal that they would meet all of the requirements of our regulations. I think that we had not placed much, if any, emphasis upon experience. That is one of the questions that we are trying to understand as a result of all the things we have learned from reviewing the accident.

For example, is it necessarily true that any utility is going to be able to develop enough technical understanding to operate a nuclear powerplant?

Mr. LENT. Is it your feeling now that engineering ought to be done by a separate party altogether?

Mr. AHEARNE. When you say "ought to be," that would mean a requirement. Myself personally nor the Commission as a commission have not reached that conclusion. It is certainly true that we have now recognized we have to lean much harder on our review people and, therefore, on the licensee to guarantee that there is sufficient management on the licensee's part of the quality control system.

Mr. LENT. You have these situations where plants are constructed by TVA and Duke where they do the whole things themselves. Is your experience there they do just as good a job, or even a better job, where there is the total package?

Mr. AHEARNE. I will defer in a moment to Mr. Stello.

My impression has been that they do a better job, but part of that is not just because they do the whole package. They are both large organizations with many nuclear plants with a lot of people who are experienced in the construction and design.

Mr. LENT. You do not have this problem with conflict of interest that Mr. Markey was talking about earlier because the same people are looking over one another's shoulder and the quality

assurance and quality control functions are fulfilled by the same entity?

Mr. AHEARNE. I have not noticed that, but I will ask Mr. Stello, who is more heavily involved.

Mr. STELLO. In response to your first question, I guess I will reinforce what Chairman Ahearne has said. The experience that we have with the utilities who have performed both the architect and engineer functions as well as the construction function have been equal to or better than other facilities, maybe for the most part better. The construction has gone along smoother with fewer problems.

The concept that there is a conflict of interest on behalf of the constructor building a job says that there is a mechanism somehow that is built in that says he somehow is rewarded if he does a poor job. I do not believe that. I reject the notion.

I think they are in business to make money and in order for them to make money their reputation as a constructor is vital to them. If they do shoddy work or if they don't get a project built properly, I believe it is going to hurt them where it will hurt most and they will be an unsuccesful constructor. So I think that the incentive is for them to in fact build a good product and try to do that the first time. So I don't believe there is a conflict of interest. I do not see evidence of that.

Mr. LENT. I do not know why you did not make that response to Mr. Markey when he posed some of his questions. What you are saying now, as I understand it, is that when a licensee acts in all three capacities—TVA and Duke—operating as licensee, architect-engineer, and constructor, you really get the best end product? Is that what you are saying, based on your experience?

Mr. AHEARNE. Mr. Lent, let me answer for Mr. Stello one of those points. He would probably not want to say this. I have found in many forums it is difficult to answer Mr. Markey. He usually does not give you time to do so.

Mr. STELLO. May I answer for myself, too? I hope that my silence does not indicate that I agreed with many of the things Mr. Markey said because I do not, especially some of his earlier remarks regarding why we are doing some of the things we are doing.

He would suggest that it is only because we have hearings or where there are news stories written that we respond. I reject that notion rather vigorously.

Mr. LENT. Thank you, gentlemen, for your responses. I have no further questions.

Mr. ECKHARDT. Let's get to this question of conflict of interest. I think that no one intentionally builds an unsafe powerplant. No one intentionally drives at 85 miles an hour with the intent of getting killed. He drives at 85 miles an hour to get to a place that he thinks he ought to be to earlier than perhaps is feasible or safe.

Also, on this question of conflict of interest, if it is the experienced utility that is engaged in quality control, there really is not a conflict of interest. It is the same as if a person building his own house is also inspecting it and has the experience to do so. He has to live in that house. He wants it to last.

In the first place I do not believe that Brown & Root would intentionally hazard their reputation by shoddy work. I use Brown & Root only here as an example. I do not want to point the finger at that company particularly.

Any constructor is going to want to do a good job but he is under a strong incentive to complete it within a given period of time so as to be paid for it. Then in a sense they are very much like the homebuilder as compared with the homeowner. They walk away from it.

If there is no clear delineation of responsibility of who pays for it, that is, the cost overrun, there is a conflict of interest in that case very much greater, it seems to me, than any potential conflict of interest in the utility itself doing the inspection.

Mind you, I am not precisely taking the position of one side or another. I am not one who is looking for devils in this case, but I am one who is looking for persons who have an interest in finishing in a hurry and walking away with their buck. It seems to me that is the situation that exists here.

Mr. AHEARNE. The problem that we found in this case and which does possibly exist is when the quality control organization does not have independent access to the overall people responsible, in this case the licensee, Houston. In order to have the kind of competent review, clear-cut identification of issues, and insure that those issues get resolved, the quality control people must have that kind of independence.

Whether that independence is found by a separate organization, whether it is found by a part of the organization made separate to report independently, or whether it is found by the whole organization being one and then having this overall understanding that you have mentioned, any one of those is, we have found, successful. What is not successful is if you submerge the quality control and they bump ahead as you identified.

Mr. ECKHARDT. Suppose you have quality control under one supervisor and you have construction under another, as Brown & Root has. Suppose quality control looks at the premises and sees some rumble where a concrete pour is to be had and points it out, says it is not clean enough for the pour.

A construction foreman comes in and puts on a lot of pressure to go ahead with the pour. I am using this hypothetically, mind you. I do not think the construction foreman intentionally wants to create an unsafe situation or a jeopardize his company's reputation. However, his major interest is to complete the job, keep people moving, not to hold things up.

The truck is out there rotating. He does not want to carry it off and dump it again. He recognizes this might cost tens of thousands of dollars in that particular pour. He wants to push to complete.

If the inspection is not totally independent, whether it is within Brown & Root or by an independent agency, the tendency will be for construction to overwhelm inspection, it seems to me. Is that not correct?

Mr. STELLO. I think you are describing pretty much the process that really went on at south Texas. That was the kind of thing we had concern over, where the pressures that were being put by the

construction people and the cost and the schedule emphasis were there.

The quality control people will tell you that that pressure was there. They felt it. There were cases of intimidation and harassment. That is the kind of environment that was indeed there. Probably Brown & Root should have recognized it earlier and corrected it and got rid of it. You have to have these quality control people have that independence.

We have only been talking about Brown & Root. That is the way their system was going on. What about the licensee?

Where was he in all of this? Why wasn't he aware that pressure was there? Why didn't he do something about it and say, "You will have to send the truck off. We are not going to pour. We are not ready. Stop."? That is the kind of dedication that you need to see.

That is the kind of a change in attitude that we now have at the south Texas project with the current environment, including Brown & Root themselves. They recognize that they had in fact created that kind of an attitude. Within the construction staff they were somewhat intimidating.

Mr. ECKHARDT. Why don't you do this: When you see a situation where somebody like H.L. & P. does not have the experience that a larger concern already experienced in nuclear plants, et cetera, has, why don't you insist on something different than that you would insist on in the situation of the experienced plant?

It would seem to me you should make a different general policy determination. I am not saying now that you ought to have a firm rule in advance because you have all of these things tailor made. You have plants that you can count on the fingers on two hands, I suppose.

It would seem to me that when you have someone whom you know is relying on the contractor primarily for inspection, in that situation the contractor should do his contracting work and somebody else completely separate ought to do the quality inspection.

I would also like to ask you in a situation in which there has not been a division of responsibility properly administered why you believe that that same situation will suddenly be reformed because of a fine against the utility. The utility tells me very strongly and very positively that the $100,000 fine will not be passed on to the ratepayer. I have had talks with them on that basis.

However, they do not tell me what is going to happen about a much larger figure, that is, what additional cost of overrun is going to be occasioned by the delays in work, the reworking, and whatever may happen with that particular facility or parts of it.

It seems to me that you simply have to look at these questions and in the particular case determine what you are going to do dependent on the experience of the utility and the history and the experience of the contractor.

I just cannot see how simply telling Brown & Root, "You just divide your function more sharply in the future," that you could be assured this plant is going to be properly constructed. I do not want to advise you or pressure you in your decision in that particular case. I simply want to raise at least the possibility of experience in the past indicating what may occur in the future.

I also want to raise the question of whether or not in advance of the license the question of the particular experience of the utility should not influence your decision about separate inspection in a separate organization from construction.

Mr. AHEARNE. As you noted in your comments, I cannot address specifically with regard to south Texas because one of the issues the operating license hearing is specifically addressing is whether or not the system that will be put in place as a result of this recent go-round is going to provide a plant adequately constructed.

That is the immediate issue that the licensee——

Mr. ECKHARDT. Let me interject that I do not want to influence that. I understand that there are special circumstances. You have a plant under way in which there must be weighed factors of safety, factors of cost overrun, and factors which are unique to this question.

The questions I am asking you have to do with a general policy decision. I asked them because it may be desirable for us to fashion guidelines legislatively in this area. We would like to have your advice.

Mr. AHEARNE. I will go back and find out how far along my people are on doing that review of the various approaches of management. I will reexamine a list of the people who are in either construction permit or under construction to see whether or not there are other cases where this concern should be examined. Then I will promise to have it examined.

Mr. ECKHARDT. I would like to ask unanimous consent that the record be held open here for you to supply us with that factual information and also with certain views and opinions concerning what general policy might be put into effect to meet the problems which may be not just with respect to the south Texas plant but with respect to the entire question of attempting to build these things with minimum cost of overruns and maximum safety.

Mr. AHEARNE. Yes, sir.

[The following letter with attachment was received for the record:]

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555

OFFICE OF THE
CHAIRMAN

November 13, 1980

The Honorable Bob Eckhardt
Chairman
Subcommittee on Oversight and
Investigations of the Committee
on Interstate and Foreign Commerce
United States House of Representatives
Washington, D.C. 20515

Dear Mr. Chairman:

At the September 23, 1980, hearing of the Subcommittee on Oversight and Investigations, you asked this Commission to provide its views and opinions on what can be done to minimize cost overruns and increase safety in the construction of nuclear power facilities. Subsequent informal discussion with your staff indicated that the Subcommittee's major interest concerns the relationships between the NRC and State public utility commissions and the efforts of this Commission to ensure that costs of construction are allocated equitably and with concern for their impact on safety.

With regard to the equitable allocation of costs of construction where that allocation does not affect safety concerns, it is our view that the NRC is not the appropriate entity to make policy or to advise the Congress. Our expertise does not lie in economic regulation and, in view of the demands and the importance of our safety mission, we do not believe that it would serve the public interest for us to address cost allocation policies which do not affect safety. If economic regulatory agencies at the State and Federal levels request our assistance, in this regard we would be happy to cooperate. For instance, should a State utility commission decide that costs incurred in violation of NRC regulations, or added costs otherwise attributable to such violations, should not, be passed along to ratepayers, we would provide all data in our possession relevant to the implementation of that policy.1/ We believe that such assistance should be the full extent of our role where safety considerations are not at issue.

1/ As indicated below, we might take a more active interest in the matter if we were convinced that such a policy enhanced safety. As also indicated, however, we have not yet studied the effect of such policies on our safety objectives.

71-405 O—81——5

On the other hand, where there is a direct link between the cost allocation policies of economic regulatory agencies and nuclear safety, we believe we have a larger role to play. NRC comment and direct intervention in agency proceedings are among the responses we would consider. While we have not yet defined the precise course to follow in this area, we recognize that we cannot ignore the actions of other agencies as they affect our responsibilities. State public utility commissions in particular may adopt policies which further or impede our safety objectives, therefore we have begun to monitor some of these more closely than in the past.

However, our experience with these commissions is quite limited. We are not sufficiently familiar with the diverse policies adopted by utility commissions throughout the country. Furthermore, we do not have a firm understanding of the likely effects of these policies on safety. We believe that a comprehensive study of this subject is necessary before we can decide on a reasonable course of action. We would be happy to work with you and the members of the Subcommittee to design such a study. In this regard I have enclosed a copy of the chapter from the final report of the NRC Special Inquiry Group which addresses the question of financial disincentives to safety at TMI. Please keep in mind that the Commission has not endorsed the recommendations or conclusions of this document.

Pending the results of that study, we believe that there is one area in which concrete action can be taken that will have beneficial effects on both safety and costs of construction. The NRC presently requires a utility to have a strong quality assurance/quality control (QA/QC) program during construction of a nuclear power plant. NRC inspectors audit the utility's activities to assure compliance with our regulations. Greater emphasis on QA/QC programs would reduce the costs associated with poor quality and workmanship while better assuring the safety of the plant. We intend to pursue this subject further with our Office of Inspection and Enforcement.

The Commission appreciates your interest in these matters and looks forward to working closely with the Subcommittee.

Sincerely,

John F. Ahearne
Chairman

Attachment

12 DISINCENTIVES TO SAFETY

One of our charges was to investigate allegations that Met Ed rushed TMI Unit 2 into commercial operation at the end of 1978 in order to realize tax or other financial advantages, thereby compromising safety in the process. Although we uncovered no evidence to support these particular allegations, our investigation did reveal the extent to which any utility in the latter stages of constructing a nuclear plant (and afterwards) comes under diverse and often competing financial pressures from a variety of directions—the IRS, the State's public utility commission (PUC), the Federal Energy Regulatory Commission, (FERC), local ratepayers' organizations, the company's own shareholders, and of course the NRC. Few of these pressures arise from safety concerns; indeed, many may be counterproductive to safety. Yet there is no coordination between the various agencies involved, and little appreciation by any of them of the pressures generated by the regulatory programs of the others.

During our inquiry, we also found a variety of other factors—regulatory and contractual, as well as financial—that may work as unintended disincentives to safety. The common characteristic of these factors is that they do not appear, at first blush, to have any adverse effect on safety, nor are they supposed to have such an effect. Their impact is more subtle.

The length of time consumed by the NRC's license review process may in itself create disincentives to innovation in safety. From initial application to plant startup may take 10 years or more. The more time an applicant must spend in the administrative process, beyond that which is necessary to build a plant, the greater the applicant's cost. There is, therefore, a recognized incentive for the applicant, if he cannot shorten the process, at least not to contribute to lengthening it.

One way an applicant may cause delay in the review process and thus increase its cost is to make design changes or other innovations, including those that would ensure greater safety. By injecting these new elements into the license review process in midcourse, the applicant runs the very real risk that the NRC will lengthen the process as it undertakes to review the innovations. The same is true with respect to any incremental safety changes the vendor may consider making, as we mention below.

NRC reporting requirements also appear to have created disincentives to safety. When a licensee, supplier, or architect-engineer identifies a "substantial safety hazard," NRC regulations require that he report it. The NRC has provided little guidance on the definition of "substantial." But when a report is made, NRC usually conducts a lengthy examination, sometimes including a hearing, and may ultimately impose civil penalties. On occasion, a number of plants have been ordered closed down pending the resolution of the problem raised.

The time consumed by this administrative activity, in addition to the prospect of a fine, may cause those who have a legal reporting obligation to conclude that identifying and dealing with safety issues, particularly those that seem relatively unimportant, is "more trouble than it is worth." In addition, these parties know that filing a report will

likely cause others with whom they do business to become enmeshed in the administrative process. Thus, those in the best position to identify safety concerns may simply stop looking for them and raise them only when they feel it is absolutely necessary to do so.

Within the NRC, complacency has created a climate in which the pursuit by an individual employee of concerns regarding the safety of systems or hardware that the staff has previously concluded was safe is discouraged. Indeed, it appears well understood by the staff that assertion of safety concerns, particularly those that may be controversial, is most unlikely to advance one's career and is far more likely to result in stigmatization. In short, at the NRC "whistle blowing" and "rocking the boat" are likely to lead to "career paralysis." NRC appears to have taken some measures to ensure that expression of concern about safety from within the agency's ranks is not stifled. We believe, however, that increased and sustained effort is necessary to encourage expressions of legitimate dissent.

Financial disincentives to safety, probably not apparent to the casual observer, can arise both from Government regulation and the relations between private parties in the industry. Actions by commissions that regulate rates can create important financial disincentives. (State PUCs regulate retail rates, and FERC regulates wholesale rates.) For example, utilities are permitted to include interest costs prior to operation among capital costs in their rate base. However, part of those costs may be disallowed by FERC if it concludes that the construction and preoperational period took too long. Thus, utilities, to minimize financial risk, may rush through preoperational testing at the risk of safety.

Rate commission policies may also discourage a utility from adding safety features which are not "required by NRC." Such "extras" may be regarded as "goldplating" and their cost may not be permitted as part of the rate base on the theory that, because the NRC did not require them, they are unnecessary. A utility may also be reluctant to install a "safer" subsystem than the existing one in a plant already in operation because of a concern that the cost will not be approved by the commissions for inclusion in the rate base. The theory of excluding such costs is that the licensee should have made the change during the construction phase when the incremental cost would have been much less. Similarly, when a utility makes a safety improvement which causes temporary shutdown or reduction in power production at the plant, it faces another cost—for replacement power—that it may not be able either to pass on directly to consumers or to recover by addition to its rate base.

Income tax regulations may also create disincentives to safety. It is in the financial interest of the utility to place a plant in operation by the end of a taxable year (possibly by taking shortcuts that could affect safety) because it will be able to claim depreciation for the last 6 months of that year even if it only began operation on the last day of its taxable year. Until recently, the utility was also able to claim an investment tax credit on the cost of all qualifying equipment in the year it was placed in operation, regardless of whether it was placed in operation on the last day. This policy provided an even greater incentive to begin operations by yearend. (The regulation now has been changed to permit investment tax credit on expenditures actually made during a calendar year, even though the equipment has not yet been placed in operation.)

In the contractual relationship between vendors and utilities, there is a disincentive for a vendor to stress the importance of an improvement during construction, lest it be required under a fixed-price contract with the utility to pay for the change as part of a "licensable plant." Similarly, after construction is complete, the vendor may shrink from identifying design deficiencies for fear that the NRC will require a "fix" to be backfitted into existing plants of the same design, either costing the vendor additional money or, if the utilities end up paying, the antagonism of its customers. Similarly, a utility may risk the antagonism of its vendor if it identifies a deficiency and NRC ultimately requires the vendor to backfit other plants it has sold previously.

The financial aspects of nuclear safety are ordinarily discussed as if there were a simple tradeoff between dollars and safety. We certainly do not mean to suggest that there is no such relationship or tension, but we have found that the situation is considerably more complex than it might seem to be. Certain policies or actions that are not explicitly recognized as affecting the balance of cost and safety nevertheless have that effect.

To deal with some of the financial disincentives to safety, the NRC will have to become more aware of the relationship between the business and technical sides of the utility. Once again, it will have to be more conscious of utility management. We suggest that consideration should be given to an expanded financial analysis of utility licensees so that the NRC might be alerted when financial pressures combine to affect safety. At the same time, the agency needs to improve its method of notifying other regulatory bodies of the effect their regulatory programs have on the overall safety of nuclear plants.

Mr. ECKHARDT. Mr. Corcoran?

Mr. CORCORAN. Thank you, Mr. Chairman. I am not going to take my full 5 minutes. I have had that opportunity already.

Mr. ECKHARDT. Five minutes means 15 this morning at least.

Mr. CORCORAN. I just want to comment with regard to the particular powerplant that has been primarily the subject of the hearing. It would appear to me, particularly in view of the experience that the licensee as well as the Brown & Root organization has had, that we probably ought to examine a little more carefully not only the licensee but the people who will be involved in the construction, engineering, and all of the other aspects of the development of a powerplant. I certainly would support any effort that your agency would undertake in that respect.

When you have a licensee, or I should say potential licensee, like Duke Power or Commonwealth Edison or any of the others who have been in this business for some time, that is different from an application coming as it has from Houston Power & Light, particularly with the arrangements they had with Brown & Root.

Let me make one other comment. That is just to enlarge the record a bit with respect to the approach that the agency might take regarding the separation of the various functions—construction, quality assurance, and engineering and the architectural function.

I think that this particular case has suggested that it is an important consideration as to how these functions are performed, where the division of responsibility would rest. In the case of Commonwealth Edison, it is my understanding that they have in all cases where they have built their powerplants reserved for themselves—and, of course, they have the capacity to do this—the construction function as well as the quality assurance function. However, they have given to another organization the architectural

and engineering function. This company is known as Sargent-Lundy, one of the outstanding firms in the country.

I recognize the uniqueness of Commonwealth Edison and the size of the corporation in comparison to some of the others that are in the business. When they compared their progress on a couple plants, the Byron plant and the Braidwood plant, against the south Texas plant, all three of these started at about the same time, in 1975. The construction progress after 21 months showed that the south Texas unit 1 plant was 24 percent complete, the Byron was 25 percent complete, the Braidwood was 20 percent complete.

For unit 2, the south Texas plant was 2.8 percent, the Byron plant was 21 percent complete, and the Braidwood plant was 16 percent complete.

Another interesting comparison was that in the case of south Texas they had 510 non-manual-labor personnel and Byron had 186. For Braidwood, the figure was 140.

In the case of craft labor, skilled labor, south Texas required 2,624 people whereas Byron and Braidwood required about 1,500 people or less.

What I'm indicating here is that they have done a lot more work with fewer people and without the problems.

It seems to me when we come upon a unique circumstance, as in the case of south Texas, at the point of application before the agency we should take into account the capacity of the people who will be involved as well as the division of functions that will be included in the process.

Mr. ECKHARDT. I would like to ask unanimous consent to place in the record a communication from Mr. Kleinrath, Commonwealth Edison, and Mr. Patrick McLain, of our subcommittee, which includes some attachments which I believe give the figures you were reading.

Mr. CORCORAN. Yes, that is correct, Mr. Chairman.

[The letter referred to follows:]

Commonwealth Edison
One First National Plaza, Chicago, Illinois
Address Reply to: Post Office Box 767
Chicago, Illinois 60690

August 7, 1980

Mr. Patrick McLain
2323 Rayburn
House Office Building
Washington, D.C. 20515

Dear Mr. McLain:

In accordance with your request, attached is an in-house comparison that was made in 1978 relative to construction program and manpower at our Byron and Braidwood Stations as compared with South Texas.

Using percentages, which you understand are approximate values, approximately twice as much work has been done at our Byron Station with fewer people in the same time frame.

If you have any other questions, please do not hesitate to call.

A. W. Kleinrath

March 17, 1978

PLEASE ROUTE

Messrs: T. G. Ayers
J. J. O'Connor
B. Lee

After reviewing the attached, we made a study to compare Byron and Braidwood with the Brown & Root project described in the information sent to Mr. Ayers. I thought the below comparison would be interesting.

	South Texas	Byron	Braidwood
Date of Construction Permit	12-22-75	12-31-75	12-31-75
Size of Units	2-1250 MW PWR	2-1100 MW PWR	2-1100 MW PWR
Construction Progress at the End of 21 Months	9-22-77	8-31-77	8-31-77
%Complete			
Unit #1	24.9%	25%	20%
Unit #2	2.8%	21%	16%
Non-Manual Labor	510	186	140
Craft Labor	2,624	1,506	1,200

The Edison projects have considerable more work done with less people. Also, South Texas began 10 hour shifts in September to maintain schedule (attract people?).

A. W. Kleinrath

AWK/DRB/lr

cc: D. R. Bittner

Att.

Brown & Root, Inc. Post Office Box Three, Houston, Texas 77001

Power Division
Joseph G. Munisteri
Group Vice President and
Director

(713) 676-3161

December 5, 1977

Mr. T. G. Ayers
Commonwealth Edison Company
P. O. Box 767
Chicago, Illinois 60690

Dear Mr. Ayers:

We have enclosed an Update on the highlights of our South Texas Project which has begun its third year of construction.

We believe this project, and its participants, will add measurably to the nuclear engineering and construction industry achievements as project milestones are met.

Please look this over as a representative example of Brown & Root's achievements in the Power field.

Sincerely,

BROWN & ROOT, INC.

Joseph G. Munisteri
Group Vice President
Power Division

lr

Enclosure

Mr. ECKHARDT. Mr. Walgren?

Mr. WALGREN. I have no questions, Mr. Chairman.

Mr. ECKHARDT. Mr. Dannemeyer?

Mr. DANNEMEYER. I was not here at the beginning of your testimony. I would like to have something cleared up for me, if you would, please.

In this south Texas project from the beginning who was doing the construction inspection work for the purpose of verifying completion so that the contractor, Brown & Root, would get paid for the work done at that plant? Who was doing it?

Mr. STELLO. In terms of inspection processes that go on, Brown & Root have inspectors themselves.

Mr. DANNEMEYER. Let me ask the question this way: Did the utility have inspectors on the job from the beginning?

Mr. STELLO. Yes.

Mr. DANNEMEYER. Normally in construction work the entity that is paying out the money, the utility, has inspectors on the job to verify the work was done. Was this the practice there?

Mr. STELLO. I do not know what the contractual arrangements are as to whether they pay a certain sum of money at a certain percentage of completion.

The purpose of the licensee's inspectors is to insure that the work is done such that it meets all of the proper requirements. If it does not meet the requirements, stop the work from being done.

That is the same objective that the inspectors have that work for Brown & Root.

Mr. DANNEMEYER. Wait a minute. These inspectors then for Houston—what was the name of it, Houston Power & Light—they were on the job from the beginning for the purpose of verifying that the work was done in accordance with plans and specifications; is that right?

Mr. STELLO. Their purpose is to audit the work that is going on by the constructor who is Brown & Root.

Mr. DANNEMEYER. Were those inspectors employed by Houston Power & Light on the premises of the construction site from the beginning?

Mr. STELLO. Yes. They had inspectors paid by Houston Power & Light.

Mr. DANNEMEYER. Did those inspectors employed by Houston Power & Light have the ability, the supervisory capacity at any point during the construction process to say, "This is not up to snuff. You will not continue until it is corrected."

Mr. AHEARNE. You might want to have Mr. Seyfrit sworn and then answer. He is the regional director.

Mr. ECKHARDT. Mr. Seyfrit, why don't you come on up.

Do you swear to tell the truth, the whole truth, and nothing but the truth, so help you God?

Mr. SEYFRIT. I do.

Mr. AHEARNE. Mr. Seyfrit is the regional director. He has been with the project many years.

Mr. SEYFRIT. Actually I have not been with the project down there that many years. I have only been down there 2 years.

However, in regard to the role of Houston Lighting & Power as far as inspection is concerned, I think it perhaps would not be fair to refer to them as inspectors. They are more in an audit function.

The primary detailed inspection of each and every activity is done by Brown & Root employees.

Mr. DANNEMEYER. Wait just a minute. I do not understand this.

My experience in the construction business is such that the entity paying the money has somebody on the job verifying that the work was done in accordance with plans and specifications. My vantage point of experience tells me that Houston Power & Light should have had inspectors, hands-on inspectors, working at that site from the beginning supervising, if you please, the inspecting work of Brown & Root to verify that it was being done in accordance with plans and specifications before they authorized money to be paid out.

Was that done?

Mr. SEYFRIT. In the sense that you stated, no, sir, that was not done.

Mr. DANNEMEYER. If that is not done, somebody has not got their act together. I do not know how you can run a construction program without that kind of an operation in existence.

Mr. SEYFRIT. May I try to explain the process? As I indicated, Brown & Root does the actual inspection of each and every activity that takes place. They inspect the welds.

Mr. DANNEMEYER. I understand that, but they have an inherent conflict of interest.

Mr. SEYFRIT. May I continue?

Mr. DANNEMEYER. Yes.

Mr. SEYFRIT. Houston Lighting & Power's function is somewhat similar to that of the Nuclear Regulatory Commission. It is an intermediate level, if you will. Their function and the way they carry out their role is to audit, to review the inspection work that is done by Brown & Root, to do some limited inspection of their own on a sampling basis, and on that basis make the determination that, yes, Brown & Root is carrying out its function properly.

Mr. DANNEMEYER. Now I think you are saying that to a limited extent Houston Power & Light did have inspectors on the job verifying the inspecting work done by Brown & Root.

Mr. SEYFRIT. Yes, that is what I intended to convey in the beginning. I thought that you were suggesting that Houston Lighting & Power should have been doing all of the inspection points.

Mr. DANNEMEYER. No, not all of it, but they should be verifying.

Mr. SEYFRIT. Then it is a case of misunderstanding. I think we are in agreement now.

Mr. DANNEMEYER. Along with the point that Chairman Eckhardt raised, suppose a point comes when the inspectors for Houston Power & Light say that at certain stages in the construction process the work is not up to snuff, it is going to have to be redone. At that point it is clear to everybody on that site that nothing further can be done with that particular phase until the corrective work is done.

From that point on, corrective work which in the opinion of Houston Power & Light is the fault of Brown & Root, so far as that corrective work is to be done whose nickel is it?

Mr. SEYFRIT. I really do not know. I do not know what the contractual arrangement between Brown & Root and H.L. & P. is.

Mr. DANNEMEYER. That is an important point in any construction project. The way it ought to be run is that if the contractor has made a mistake in terms of what the contractor is to do, and Houston Power & Light who is paying the bill establishes that there has been a defect from that point during the corrective work, it should be the nickel of the contractor, not an add-on to the cost of Houston Power & Light.

Mr. AHEARNE. Philosophically that sounds correct, but practically that is not what the NRC does. The NRC does not get involved.

Mr. DANNEMEYER. I am not sure it should. Is there anybody here from Houston Power & Light who can answer that? I am sure that is the way it ought to be.

If Houston Power & Light comes along with a change order in the course of construction that deviates from the plan at the outset and says that the contractor, Brown & Root, implement this change order, that is on the nickel of Houston Power & Light. However, corrective work should be on the nickel of the contractor.

I got the impression from what the chairman said that the chairman believed that the cost of corrective work was just paid by Houston Power & Light as a matter of course, just pay anything. I am not sure that the construction industry runs that way, Mr. Chairman.

Is there somebody here from Houston Power & Light who could supply the answer to that, as to whether or not corrective work was on the nickel of the contractor or the nickel of Houston Power & Light? I think it is a very important difference.

Mr. SEYFRIT. I could not answer that question specifically. In general, what you say is true. That is generally the arrangement that you find.

However, as you get into the detail in some of these contracts, you find there are areas that are negotiable depending on the specific kind of fault that is found and what the efforts are that need to be set forth to correct it.

Mr. DANNEMEYER. There is a fine gray line between perceived corrective work and implemented change orders. There has been a lot of litigation over that issue.

Thank you, Mr. Chairman.

Mr. ECKHARDT. I would like to say at this time that I think we have a lot of questions that need to be answered by Houston Lighting & Power Co. We also need to give an opportunity to Brown & Root to respond with respect to some of the statements that have been made here on which there may be conflict.

We have referred here to the Texas Public Utility Commission and their responsibility with respect to protecting rates. The opportunity should and will be given to have that information at later hearings. We felt that this one should be held in Washington to lay the ground work of what the problem is.

However, most of the other actors are in the Texas area. We may well have a field hearing at that time.

By all means, we should give an opportunity for all parties who are concerned with this matter to participate rather than have our records stem totally from the Federal agencies.

I might say that my concern and my questions had rested to a great extent on some of the questions Mr. Dannemeyer has raised. The problem is that that nickel he is talking about, which I guess roughly would be equivalent to about $5 million per nickel—I suppose the question really is who ultimately has to pay the bill.

If we have a kind of cost-plus arrangement in effect in which ultimately the ratepayer pays it, there is not all that incentive for Brown & Root to strike the best contract nor engage in the best inspections.

Mr. DANNEMEYER. On that point, Mr. Chairman, I am just asking this outloud because I do not know. In the nuclear construction plant business have entities like Houston Power & Light been able to get contractors to bid on a fixed contract price basis or has it all been cost-plus?

Mr. SEYFRIT. I do not know of any cases where there has been a fixed price contract in recent years. In the early years of the nuclear industry that was done on occasion. There were turnkey projects which went that way.

There are so many complex factors involved in the ultimate cost of these plants now that I do not think anybody would be willing to take on that kind of a contract.

Mr. DANNEMEYER. Mr. Chairman, I suspect the answer would be that a contractor would say, given the tendency of Government regulators to change their minds from time to time as to what they want in order to insure and protect the public interest and safety, there is no way that any contractor with any sense would ever bid on a fixed contract basis. I suspect that would be their response, life being what it is.

Thank you, Mr. Chairman.

Mr. ECKHARDT. Are there any further questions?

Gentlemen, you have been most forthcoming in your answers and helpful to this committee in dealing with a terrifically important problem. It deals with both safety and cost to the public. We recognize what a responsibility you have.

We may have some additional questions and we would like to leave the record open for some technical information.

I would particularly like for us to find out what agencies of the Federal Government have a responsibility with respect to these questions of ultimate cost of nuclear projects. I touched on that in some of the questions we raised here.

The hearing is adjourned.

[Whereupon, the hearing was adjourned.]

[The following material was submitted for the record:]

NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

APR 30 1980

ocket Nos. 50-498
50-499

Houston Lighting and Power Company
ATTN: Mr. G. W. Oprea, Jr.
Executive Vice President
P. O. Box 1700
Houston, Texas. 77001

Gentlemen:

This refers to our special investigation of construction activities at the South Texas Project Units 1 and 2 which are authorized by NRC Construction Permit Nos. CPPR-128 and CPPR-129. Our investigation was separated into two parts:

(1) Investigation of current allegations relative to harassment, intimidation, and lack of support of quality control inspectors by QC management, and

(2) Assessment of the effectiveness of the QA/QC program for ongoing activities.

This letter and the attached report address the results of our investigation which was conducted between November 10, 1979 and February 7, 1980.

Based on the results of our investigation, it appears that certain of your activities at South Texas Units 1 and 2 were not being conducted in compliance with NRC requirements as described in the enclosed Appendix A. These items of apparent noncompliance coupled with the substantiated allegations involving production pressure, lack of support by QC management, harassment, intimidation and threats directed toward QC inspectors indicate impairment of the quality assurance program at the South Texas Project. These problems were identified in connection with the quality assurance program of one of your principal contractors, Brown and Root, Incorporated.

Further, similar items of noncompliance and substantiated allegations of harassment and lack of support of QC personnel have been the subject of previous NRC correspondence with you and indicate that your past corrective action on these matters has been incomplete or ineffective. Although these problems have been to a great extent associated with Brown and Root quality assurance program implementation, as licensee you have prime responsibility for correction. The deficiencies in the Brown and Root program were so extensive that they should have been readily detected.

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

As you are aware, the enforcement actions available to the Commission in the exercise of its regulatory responsibilities include administrative actions in the form of written notices of violation, civil monetary penalties, and orders pertaining to the modification, suspension or revocation of a license.

After careful evaluation of the items of noncompliance identified in Appendix A, and other results of our investigation, this office, pursuant to the Commission's regulations in 10 CFR 2 and 50, hereby serves the enclosed Order to Show Cause on the Houston Lighting and Power Company.

In addition to the Order, we also are proposing civil penalties, for the items of noncompliance cited in Appendix A in the cumulative amount of One Hundred Thousand Dollars. Appendix B of this letter is the Notice of Proposed Imposition of Civil Penalties.

In accordance with Section 2.790 of the NRC's "Rules of Practice," Part 2, Title 10, Code of Federal Regulations, a copy of this letter, the enclosures, and your response to this letter will be placed in the NRC's Public Document Room.

Sincerely,

Victor Stello, Jr.
Director
Office of Inspection
and Enforcement

Enclosures:
Appendix A - Notice of Violation
Appendix B - Notice of Proposed
Imposition of Civil Penalties
Appendix C - Cross References:
Violations to Report Details
Apendix D - Investigation Report
50-498/79-19; 50-499/79-19
Order to Show Cause

OM OM

APPENDIX A
NOTICE OF VIOLATION

Houston Lighting and Power Company

Docket Nos.: 50-498
50-499

Based on the results of the NRC investigation conducted during the period November 10, 1979 through February 7, 1980, it appears that certain of your activities were not conducted in full compliance with the conditions of your NRC Construction Permits Nos. CPPR-128 and CPPR-129 as indicated below.

A. 10 CFR 50, Appendix B requires that licensees holding construction permits implement a quality assurance program meeting the criteria of Appendix B for all activities affecting the safety related functions of structures, systems, and components that prevent or mitigate the consequences of postulated accidents that cause undue risk to the health and safety of the public. Section 17 of the South Texas Plant Preliminary Safety Analysis Report sets forth the Quality Assurance Program developed by the licensee to implement Appendix B.

Contrary to the above, during the period of October 1979 through January 1980, the licensee was in continuous noncompliance with 10 CFR Part 50, Appendix B in that the licensee and Brown & Root (B&R), did not adequately control all activities affecting the safety related functions to assure that such activities were conducted in accordance with the Appendix B Criteria. This continuous noncompliance is evidenced by numerous examples* in the subject area of Criteria I, III, V, VI, IX, X, XV, XVI, XVII, and XVIII, as follows:

1. 10 CFR 50, Appendix B, Criterion I states in part, "The persons and organizations performing quality assurance functions shall have sufficient authority and organizational freedom to identify quality problems . . . . including sufficient independence from cost and schedule...."

The South Texas Project (STP) Preliminary Safety Analysis Report (PSAR) in Section 17.1.1B (through Amendment 32, 10/17/75) states in part, "To assure the establishment and operation of the QA/Quality Control (QA) Program, B&R has an organization such that those performing the QA/QC functions have the freedom to identify quality problems, to provide means for obtaining solution to problems, and verify that solutions have been implemented. This organization has sufficient independence, authority and technical expertise to carry out the program in an efficient and effective manner. This is assured by B&R QA Management reporting to Management levels above and independent from pressures of production."

*Some of the listed examples occurred outside the October-January time period for which a civil penalty is proposed. Such examples support the findings that similar occurrences were present during the period for which the civil penalty is proposed. Civil penalties are not being proposed for those examples.

Contrary to the above, the results of the investigation indicate that the quality assurance/quality control functions in the civil area are not sufficiently independent, the QA/QC civil personnel do not have sufficient authority and the QA/QC civil personnel do not have the freedom to identify problems and determine they are adequately resolved. The results of interviews indicate that some civil quality control inspectors are: (a) subjected to production pressures, (b) not always supported by the QC management, (c) harassed, (d) intimidated, and (e) threatened.

Documented evidence obtained during the investigation indicated a continuing trend on the part of civil quality control inspectors to assume the position that it is easier (less pressure, harassment, and threats) to just sign the quality control documents which are necessary for construction to proceed, even though the procedural or specification requirements may not have been fully met, than to be confronted by quality control and/or construction management. It is noted, however, that during the investigation no items of major safety significance were found which related to the above findings, but the potential for future problems is great unless corrective action is taken.

Examples supporting the above findings are as follows:

a. It was substantiated that during the final preparations for the placement of concrete in Lift #5 of the Unit 2 reactor containment building shell wall (placed 4/27/79) production pressure was present and caused a QCE supervisor to override the advice of his subordinates that the area of the construction joint was dirty. The corrective action selected, which was not totally effective, was that requiring the least delay in the construction schedule.

That the action was not fully effective was evidenced by a construction foreman who saw a can float to the surface of the concrete during placement. The QCE supervisor indicated that a large number of construction personnel, including construction top site management were standing by to begin the placement and that he signed off the necessary documents to get the placement underway due to the critical time frame for ordering concrete (Allegation 11A, p. 38).*

b. A former QCE supervisor stated that whenever construction falls behind in placing concrete, QC inspectors seem to always get the blame. The statement was made on the basis of his knowledge of what upper management expressed in meetings and general conversations. He also indicated that construction always

*Page numbers refer to Report No. 50-498/79-19; 50-499/79-19.

indicates they are ready for a placement when they are not and that QC had only 24 hours to complete the inspection. He noted that construction scheduling pressure gradually reduced this period (Individual A47, p. 3-26).

c. A current QCE supervisor related that after QC had completed a preplacement inspection, the pour card had been signed and the concrete ordered, the QC personnel would find additional problems such as alterations to the forms or debris dropped into the forms. This would occur from 3 to 24 hours after the sign off. Construction personnel would try to pressure inspectors to accept these conditions because of the time and money to correct the situation. He indicated that if construction personnel were unsuccessful and the placement was delayed or stopped, then it always seemed to be QC's fault. He also indicated that construction management has a major problem in that they think of quality only as a necessary evil and that there is much controversy over schedules and cost overruns (Individual A35, p. 3-14).

d. A QC inspector stated that in the summer of 1979 he had discovered three horizontal reinforcing steel bars missing from a wall section which was being readied for concrete placement. On the previous day he had told construction personnel that he thought the wall preplacement was correct. He was verbally abused by a person from construction (Individual A17, p. 2-12).

e. Fifteen of twenty-four QC civil inspectors interviewed executed signed sworn statements wherein they claimed that their supervisors had not supported their positions during confrontations with construction personnel. An additional QA auditor and an inspector on special assignment indicated the same concern. Interviews with the construction personnel involved resulted in signed sworn statements wherein they admitted ignoring and/or bypassing the QC inspector's directive to stop by continuing the work, and then going to the QC inspector's supervisor to reverse the directive (Allegation 6). This lack of QC management support is also evidenced by the findings resulting from Allegations 3, 7A, 8A, and 9A (pages 16, 14, 32, 33 and 34).

f. A QC inspector refused to sign off on deficient Cadwelds and initiated a nonconformance report (NCR) because Cadwelder requalification was not performed as required by the specification. The construction supervisor admitted he had ignored the QC inspector, the inspector's supervisor and the NCR and ordered his men to continue Cadwelding. This resulted from a disagreement over interpretation of the specification. (Allegation 10A, p. 36).

g. Five QC civil inspectors executed signed sworn statements wherein they claimed that during a meeting a high level QA/QC manager warned them not to talk to the NRC, indicating that action would follow. This was also confirmed by another QC civil inspector (Allegation 1, p. 12).

h. Another QC civil inspector executed a signed sworn statement that a QC supervisor stated words to the effect that after the NRC leaves we will have to get rid of some of the QC inspectors. The QC supervisor acknowledged that he made such a statement in mid-November of 1979 (Allegation 4A, p. 29).

i. Another QC civil inspector involved in an incident where the concrete foreman left the placement without informing the inspector who was the acting foreman was later faced with information that the concrete foreman had said his crew was able to violate the specification without the inspector's knowledge. The inspector was informed that the foreman was bragging about the incident (Allegation 8, p. 20).

j. A QCE supervisor indicated that a person in construction attempted to harass the QA/QC program personnel by trying to remove air conditioning from the assigned office spaces (Individual A35, p. 3-14).

k. A QC inspector admitted in a signed sworn statement he falsely signed concrete curing records at the request of a lead QC person when he had not inspected the curing and in fact was not on-site at the time the inspection was supposedly made. The lead QC person however, denied that such a request was made (Allegation 1A, p. 26).

l. A QC inspector admitted in a signed sworn statement he signed off on a minor Cadweld deficiency (procedure violation) because he felt his supervisors would not support him and would side with construction (Individual A52). In this instance the QC inspector was intimidated by his past experience with his supervisor and took an action to correspond with his supervisor (p. 2-25).

m. A QC inspector was physically threatened by a construction general foreman. The QC inspector, a witness and the construction general foreman all executed signed sworn statements substantiating this event. The construction general foreman indicated he lost his temper and intended no harm (Allegation 2A, p. 27).

n. A QC inspector was physically threatened by a construction superintendent. Both executed signed sworn statements substantiating this event. The construction superintendent indicated he lost his temper and intended no harm (Allegation 3A, p. 28).

o. A QC inspector was threatened by a construction general foreman. The QC inspector, a witness and the construction general foreman all executed signed sworn statements substantiating this event. A QCE supervisor in an interview also substantiated the threat. The construction general foreman explained that he lost his temper and made no attempt to injure the QC inspector (Allegation 2, p. 13).

p. On January 4, 1980 a lecture by the Brown and Root Project QA Manager was given to the Brown and Root site QA/QC personnel and construction engineering and supervisory personnel. The lecture repeatedly overemphasized the Brown and Root QA/QC organization's responsibilities to minimize project cost and maintain the construction schedule. The lecture also strongly emphasized the fact that a Brown and Root QC inspector's decisions are subject to question, challenge and supervisory review and reversal. The lecture was recorded on video tape which continues to be used as a mechanism to project the Brown and Root policy. In addition, the contents of the lecture were put into printed form and widely distributed to employees of Brown and Root at the South Texas Project. (Appendix 5).

2. 10 CFR 50, Appendix B, Criterion IX requires in part, "Measures shall be established to assure that special processes... are controlled and accomplished... using qualified procedures in accordance with... specifications, criteria and other special requirements."

The STP PSAR in Section 17.1.9A states in part that "Houston Lighting and Power Company (HL&P) requires written procedures and controls to ensure special processes... are accomplished... using qualified procedures in accordance with applicable... specifications, criteria, and other special requirements. These procedures shall describe the operations to be performed, sequence of operations, characteristics involved... examinations, tests and inspections shall be conducted to verify conformance to specified requirements... Compliance to these requirements is mandatory for prime contractors."

From information provided to the inspector it was determined that a "test fill program" resulted in the determination that for placement of an 18 inch maximum lift thickness of soil it would be necessary to make 12 passes with the compaction equipment.

Contrary to the above, Brown and Root construction procedure, STP-QCP A040KPCCP-2, Rev. 2, required only 8 passes with the compaction equipment for the placement of a maximum lift thickness of 18 inches of soil. Thus the construction procedure did not reflect the necessary number of passes of compaction equipment which had been established in a qualification test procedure (p.61).

3. 10 CFR 50, Appendix B, Criterion XVI requires in part, "Measures shall be established to assure that conditions adverse to quality, such as... defective... equipment... are promptly identified and corrected. In the case of significant conditions adverse to quality, the measures shall assure that... corrective action taken to preclude repetition."

The STP-PSAR in Section 17.1.16A states in part, "Houston Lighting and Power Company (HL&P) will require measures be established to assure conditions adverse to quality will be promptly... corrected... In the case of significant conditions adverse to quality, measures shall be taken to ensure the cause of the condition is determined and corrective action is implemented to preclude repetition."

The FSAR in Section 2.5.4.5.6.2.4 and Brown and Root Specification No. 3YD69YS029, Rev. F, paragraph 9.e, and Brown and Root Procedure No. A040KPCCP-2, paragraph 3.3.3.5 require that at least one relative density test be performed for every fourth field sand cone density test.

Contrary to the above, a review of Pittsburgh Testing Laboratory data on December 18, 1979, indicated that a relative density test had not been performed since November 17, 1979 as a result of equipment failure. Plant backfill continued to be placed and several sets of four field sand cone density tests were completed without the companion relative density tests being performed (p.64).

4. 10 CFR 50, Appendix B, Criterion V requires in part, "Activities affecting quality shall be prescribed by documented instructions, procedures... appropriate to the circumstances.

The STP PSAR in Section 17.1.5A states in part, "Appropriate requirements have been established in the Houston Lighting and Power Company (HL&P) Quality Assurance (QA) Program to ensure quality related activities for the South Texas Project (STP) are prescribed by documented instructions, procedures... the responsibility for development of these methods, procedures and instructions is delegated to the organization performing the activities... The HL&P QA Department has the responsibility for ensuring that methods, procedures and instructors (sic) are developed and implemented for all activities relating to the STP."

Contrary to the above, Pittsburgh Testing Laboratory QA Procedure No. IS-S11-D1556-64 indicates that the in-place density measurements are to be performed according to EAASTM D-1556, however there are no requirements in the procedure which define the location or depth of the samples. A review of the records by the inspector revealed that the samples were taken at various depths in a given lift with no specific correlations of results available (p. 61).

5. 10 CFR 50, Appendix B, Criterion XVII requires in part, that "Sufficient records shall be maintained to furnish evidence of activities affecting quality."

The STP PSAR in Section 17.1.17A states, in part that, "The STP QA Plan specifies:

1) The records are required to be maintained to show evidence of performance of activities affecting quality. Typical records to be maintained include: . . . inspection and test reports. . ."

Paragraph 1.3.3.1 of B&R's Quality Construction Procedure CCP-2 states, "All inspection and laboratory testing will be conducted to assure compliance with all specifications . . . and the requirements of this Quality Construction procedure . . . The inspectors will document their findings . . ."

Contrary to the above, neither the applicable B&R procedure nor the test record form SF-6 required that the lift thickness and number of passes of the compaction equipment be documented.

These data are needed to assure that the backfill material is being systematically placed and compacted to obtain the required densities (p. 65).

6. 10 CFR Part 50, Appendix B, Criterion XVI states in part, "Measures shall be established to assure that conditions adverse to quality, such as failures, . . . deficiencies, deviations, . . . and nonconformances are properly identified and corrected. In the case of significant conditions adverse to quality, the measures shall assure that the cause of the condition is determined and corrective action taken to preclude repetition."

The STP PSAR in Section 17.1.16A states in part, "The identification of a discrepancy or nonconformance requires certain steps to be taken to ensure proper closure of the item. The specific steps to be followed are as follows: 1 . . . 5. Verification (followup) by original identifier of discrepancy or noncomformance to ensure its implementation and action to preclude repetition or recurrence."

Contrary to the above, no effective program has been implemented on a continuing basis to review and analyze Nonconformance Reports, Examination Checks/Inspection Books or Field Requests for Engineering Action for repetitive occurrences to ensure that root causes are identified and corrective action is taken to preclude repetition. Further, no formal, approved procedures to implement such a program had been developed as of November 28, 1979 (p. 94).

7. 10 CFR 50, Appendix B, Criterion XVI as implemented by South Texas Project PSAR Section 17.1.16, states in part, "Measures shall be established to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, . . . are promptly identified and corrected. In the case of significant conditions adverse to quality, the measures shall assure that the cause of the condition is determined and corrective action taken to preclude repetition . . ."

An HL&P letter to the NRC, ST-HL-AE-374 dated August 31, 1979, pertaining to lifting the HL&P Stop-Work-Order for placement of containment shell concrete specified that the following measures had been implemented for all concrete placement:

1) "Very detailed preplacement planning is carefully performed to identify potential consolidation problems . . ."

2) "Increased attention is given to logistics to provide for backup equipment, access for inspection, lighting and manpower assignments . . ."

3) "Special additional training for Construction and Quality Control personnel is given to cover procedures for placement, vibration . . ."

Contrary to the above, work observed, statements by site personnel, quality assurance records and site internal surveillance reports show that the corrective actions outlined in HL&P letter ST-HL-AE-374 have not been effective to preclude repetition. Examples of this ineffectiveness are as follows (pages 53 and 54):

1) Concrete placement personnel were using improper consolidation practices and lighting as observed by an NRC inspector was inadequate for placement CII-W312 made on November 20, 1979.

2) Concrete placement personnel were using improper consolidation practices on placement DG1-M1 made on December 7, 1979. Furthermore, an insufficient number of preplacement inspectors were assigned to conduct the final inspection.

Construction work in the placement area was being performed during the night prior to the placement and during the morning of the placement.

This "last minute" construction activity, at least in part, delayed the start of the placement from the scheduled 7:00 a.m. until approximately 11:00 a.m. This scheduling resulted in undue pressure on the QC inspectors to quickly accept the placement conditions. No specific placement method (sequence) was specified in the placement plan or discussed in the preplacement meeting. In addition, the report of the post placement interview did not address the problems with last minute construction work or the loose reinforcing steel that delayed the start of the placement and was again identified after placement had begun.

3) Interviews with QC inspectors and notations on Inspection Books, Examination Checks, post placement interview reports and Site Internal Surveillance SIS-26 for placements ME1-S047, CS2-W7, ME2-W012-06, CI1-W81B and ME2-W001-04 indicate that poor consolidation practices and excessive lift thickness continue to be problems.

8. 10 CFR 50, Appendix B, Criterion V states in part, "Activities affecting quality shall be prescribed by documented instructions, procedures or drawings... and shall be accomplished in accordance with these instructions, procedures or drawings."

10 CFR 50, Appendix B, Criterion V as implemented by the STP PSAR Section 17.1.5, states in part, "...quality related activities for the South Texas Project (STP) are prescribed by documented instructions, procedures or drawings; accomplished in accordance with such documents;..."

Brown & Root (B&R) Quality Assurance Personnel Training Manual Part 1, Supplement E, Section 5 specifies the required educational/experience levels for Level I and II civil inspectors. For example, a Level II inspector with a degree from an accredited engineering or science college or university must have one year's experience in quality assurance, including testing or inspection, or both.

Pittsburgh Testing Laboratory (PTL) Quality Control Procedure No. QC-PQ-2, Appendices II and III specify the required educational/experience levels for Level I, II and III PTL inspectors. These appendices identify the qualification requirements detailed in ANSI-N45.2.6 and ASME Section III, Division 2 respectively.

Contrary to the above, of 14 Brown & Root civil QC inspectors and six PTL concrete inspectors, for which qualification records were examined, five B&R and three PTL inspectors did not have the required applicable QA/QC experience at the time of their certification (p. 58).

9. 10 CFR 50, Appendix B, Criterion VI, states in part, "Measures shall be established to control the issuance of documents, such as instructions, procedures, and drawings, including changes thereto, which prescribe all activities affecting quality . . ."

The STP PSAR, in Section 17.1, states in part, "Brown and Root provides written procedures for controlling the preparation, review, approval, and issuance of specifications, drawings, procurement documents, procedures, instructions, and changes thereto, which delineate activities affecting quality."

Section 6, of the Contractors Quality Assurance Manual, states in part, "Documents used for the design, procurement, and construction of code and safety-related items shall be distributed and controlled in accordance with approved Project Procedures. . ."

Contrary to the above, the licensee's controlled copies (Nos. 04 and 05) of the Contractors Quality Assurance Manual on January 8, 1980 did not contain the latest issue of interim changes. Additionally, the licensee's controlled copy of the Contractors Weld Filler Material Specification, 1UD2OWS001-E, did not contain the latest document change notices (DCNs) (DCN/11/16/77 and DCN/3/28/78), (p. 69).

10. 10 CFR 50, Appendix B, Criterion IX, states in part, "Measures shall be established to assure that special processes, including welding . . ., are controlled and accomplished by qualified personnel using qualified procedures in accordance with applicable codes, standards, specifications. . ."

Section 17 of the licensee's PSAR, titled "Control of Special Processes," states in part, ". . . written procedures and controls be prepared to ensure special processes, including welding, . . . are accomplished in accordance with applicable codes, standards, specifications, . . ."

ASME, B&PV Code 1974 through Winter 1975 Addenda, Section III, paragraph ND-4412, "Cleanliness and Protection of Welding Surfaces," states in part, ". . . the work shall be protected from deleterious contamination and from rain, snow and wind during welding . . ."

Contrary to the above, the inspector observed on at least three occasions safety-related pipe welding activities being performed without adequate protection from the atmospheric conditions described above. Subsequent examination of these welds showed that they had unacceptable defects. For example, the radiograph for field weld 0005 in line AF2004, made without adequate protection from the wind, which would cause loss of cover gas, showed high levels of oxidation (p. 72).

11. 10 CFR Part 50, Appendix B, Criterion IX, states in part, "Measures shall be established to assure that special processes, including . . . nondestructive testing; are controlled and accomplished . . . in accordance with applicable codes, standards, specifications, criteria, and other special requirements."

Section 17 of the licensee's PSAR titled "Control of Special Processes" states in part, ". . . written procedures and controls be prepared to assure special processes, including . . . nondestructive testing . . . are accomplished . . . in accordance with applicable codes, standards and specifications . . ."

a. Paragraph T-233.2 of Section V of the ASME B&PV Code 1974 through Winter 1975 Addenda requires that all radiographs be free from mechanical, chemical, or other blemishes to the extent that they cannot mask or be confused with the image of any discontinuity, including; fogging, processing defects such as streaks, water marks, or chemical stains.

Contrary to the above, the inspector reviewed at least 50 final radiographs of production (field) welds and of welder qualification tests which displayed significant light fogging and chemical contamination to such an extent that proper interpretation of the radiograph was not possible in whole or in part (p. 79).

b. Paragraph T-290 of Section V of the ASME B&PV Code 1974 through Winter 1975 Addenda states in part, " . . . radiographs shall be examined and interpreted . . . record on a review form accompanying the radiographs the interpretation of each radiograph and disposition of the material examined . . ."

Contrary to the above, the inspector observed at least 12 radiographs of field welds and one radiograph for a welder performance qualification test weld which contained linear indications that had not been recorded on the accompanying interpretation sheet (p. 82).

ASME B&PV Code, 1974 through Winter 1975 Addenda Section III, Paragraph ND-5351, "Evaluation of Indications" specifies that any indication which is believed to be nonrelevant shall be regarded as a defect and shall be reexamined to verify whether or not actual defects are present. Surface conditioning may precede the reexamination.

The contractors Liquid Penetrant Examination procedure, ST-NDEP-4.1, reiterates the above requirements.

Contrary to the above, the inspector observed the performance of a liquid penetrant examination for field weld number 0017 in

. the essential cooling water system for which the results were not evaluated according to these requirements (p. 76).

12. 10 CFR 50, Appendix B, Criterion V requires in part, "Activities affecting quality shall be prescribed by documented instructions . . . and shall be accomplished in accordance with these instructions,..."

The STP PSAR in Section 17.1.5B states in part, "Engineering, construction, inspection, testing, and planning techniques are used to assure that activities affecting quality are set forth by written B&R instructions, procedures and drawings, and are accomplished in accordance with these instructions, procedures and drawings."

Contrary to the above, on December 10, 1979, the inspector determined that an interim change ST-NDEP to ST-NDEP-4.1, "Liquid Penetrant Examination," was issued on August 30, 1979 and was inserted in the procedure and the applicable page of the procedure was removed. The interim procedure is valid for 60 days. The inspector observed that the invalid or cancelled insert was being used by B&R NDE personnel during January 1980. A similar example was observed relative to inserts for ST-NDEP-2.1, dated March 13, 1979. This appears to be a generic problem (p. 77).

13. 10 CFR 50, Appendix B, Criterion XVI states in part, "Measures shall be established to assure that conditions adverse to quality such as . . . deficiencies, deviations, . . . and nonconformances are promptly identified and corrected."

The STP FSAR states in Amendment 7 dated July 16, 1979 in Chapter 3, paragraph 3.8.1.6.3, " . . .:

a. Subparagraph CC-4333.3, Initial Qualification Tests, serves as an alternate to Section C.1 of Regulatory Guide 1.10, except that a splicer will be requalified if in any 15 consecutive Cadwelds there are two unacceptable (either visual or tensile) Cadwelds made. The splicer will be requalified in the position or positions in which the failure(s) occurred."

B&R Specification No. 2A01CCS02B-G "Concrete Construction" (applicable at the time in question) states in paragraph 5.3.3.6, "When a splicer accumulates two unacceptable tests, either visual or tensile, within a unit of 15 consecutive test samples and the rejections are not due to material deficiencies, he shall not be permitted to continue splicing until he has requalified according to paragraph 5.3.3.5."

Contrary to the above, five Cadwelders who had accumulated two visually unacceptable production splices within a unit of fifteen (15) consecutive splices were permitted to continue making production splices without requalifying (p. 37).

14. 10 CFR 50, Appendix B, Criterion XVI states in part, "Measures shall be established to assure that conditions adverse to quality, such as failures . . . deviations . . . and nonconformances are promptly identified and corrected. . . . the cause of the condition, and the corrective action taken shall be documented and reported to appropriate levels of management."

The STP PSAR in Section 17.1.16b states in part, "Should conditions exist that after a reasonable time for resolution, a deficiency or nonconformance is not corrected, the QA Manager is required to report the incident to the Power Division Senior Group Vice-President any time agreement on corrective actions to be implemented cannot be attained, the findings may be brought directly to the Power Division Senior Group Vice-President for resolution."

Contrary to the above, there was no objective evidence that the Division Senior Group Vice-President was advised of the failure to take action on repetitive deficiencies documented in B&R site surveillances SIS-12 and 12.1 through 12.5, nor the failure to get responses and/or corrective action on SIS-18 and the B&R letter 5153 dated November 12, 1979 (p. 106).

15. 10 CFR 50, Appendix B, Criterion V states in part, "Activities affecting quality shall be prescribed by documented instructions, procedures or drawings... and shall be accomplished in accordance with these instructions, procedures or drawings."

10 CFR 50, Appendix B, Criterion V, as implemented by South Texas Project PSAR Section 17.1.5 states in part, "The HL&P QA Department has the responsibility for ensuring that methods, procedures and instructions are developed and implemented for all activities relating to STP."

HL&P Project Quality Procedures PSQC PC, Revision 1, and PSQP-A3, Revision 9, state in part, "All checklists shall be completed in full, signed and dated by the QA personnel involved, and filed in the site QA office. Should any items on the checklist not be applicable to the operation, that item shall be marked, NA. Items found to be satisfactory will be marked S. Items not audited shall be marked N. Any discrepant items or deviations from specifications shall be marked "D" and discussed in the "Remarks" section.

The QA surveillance personnel shall document all nonconformances and deficiencies according to PSQP-3.

Notification of Brown & Root Site QA: Whenever a discrepant item or condition for which B&R or a B&R subcontractor is responsible is identified by HL&P QA, Brown & Root site QA shall be notified immediately. The notification may be by one of the previously mentioned HL&P Discrepancy Notification Documents or orally. If

immediate and acceptable action and recurrence control (as applicable) are implemented by B&R pursuant to oral notification the item may be closed out on the checklist itself if a checklist was used. Reference should be made on the checklist as to the corrective action."

Contrary to the above, civil surveillances C.2.1 through C.2.5 were not properly documented as required by the written procedures. That is, unsatisfactory conditions and corrective action were not always documented during the period of 1978 and 1979 (p. 103).

16. 10 CFR 50, Appendix B, Criterion XV requires in part, "Measures shall be established to control materials, parts, or components which do not conform to requirements in order to prevent their inadvertent use . . ."

The STP PSAR in Section 17.1.15B requires suppliers to establish and implement procedures for controlling items or processes that do not conform to requirements of the applicable codes or standards.

ASTM D-1586-67, identified by Houston Light and Power Company as the applicable standard for site soil penetration tests, states in paragraph 2.3, "The assembly shall consist of a 140 lb. weight."

Contrary to the above, site soil penetration testing activities were allowed to continue during the period January 28, 1980 to February 4, 1980 using a weight ("hammer") which had been identified as nonconforming to the requirements of ASTM D-1586-67 (p. 67).

17. 10 CFR 50, Appendix B, Criterion XI, requires in part, "Test procedures shall include provisions for assuring that all prerequisites for the given test have been met, that adequate test instrumentation is available and used. . . ."

The STP PSAR Section 17.D, paragraphs 17.1.11A and 17.1.11B states in part, "Houston Lighting and Power Company (HL&P) Quality Assurance (QA) Program requires prime contractors, subcontractors . . . designate appropriate tests to be performed at specific stages of . . . construction. Conduct of tests will be governed by written procedures which will incorporate requirements and acceptance limits . . . Tests will be conducted in accordance with these procedures . . .

"The prime contractors Brown & Root, Incorporated (B&R) . . . shall ensure all necessary tests are required and conducted. Such testing will be performed in accordance with quality assurance and engineering test procedures which incorporate . . . the test requirements . . . Test requirements . . . are provided by the organization responsible for the design of the item under test . . .

"B&R engineering will establish the required test program . . . in appropriate specifications. The suppliers and B&R Construction are required to establish detailed procedures for the tests . . . The test procedures shall include provisions for assurance that the prerequisite for the test have been met, that adequate instrumentation is available and will be used . . ."

A Woodward-Lundgren document, dated August 1, 1975 entitled Appendix B-1 Revision 2, presented to the NRC on February 5, 1980 as the applicable QA procedure, states that split-spoon samples should be taken according to ASTM D-1586-67.

Paragraph 2.2 of ASTM D-1586 states, "The sampler shall be constructed with dimensions indicated on Figure 1. The drive shoe . . . shall be replaced . . . when it becomes dented or distorted." Figure 1 shows a 1.375 inch inside diameter of the split-spoon sampler cutting edge and a 0.75 inch taper.

Contrary to the above, the split-spoon used in the backfill test program during the period January 28, 1980 to February 5, 1980, did not conform to the requirements of ASTM D-1586-67 in that the inside diameter of the cutting edge was measured to be 1.5 inches and the driven end of the split-spoon was badly distorted and had a 0.50 inch taper. Thus the test procedure which defined the proper dimensions on the equipment was not followed (p. 67).

18. 10 CFR 50, Appendix B, Criterion XVIII states in part, "A comprehensive system of planned and periodic audits shall be carried out to verify compliance with all aspects of the quality assurance program and to determine the effective use of the program."

The STP PSAR Section 17.0, paragraph 17.1.18A states in part, "Houston Light and Power Company (HL&P) requires . . . periodic audits be performed to verify compliance with all aspects of the program . . . to verify by evaluation of objective evidence . . . program has been properly implemented; to assess the effectiveness of the QA program; to identify . . . and to verify correction of identified nonconformances . . . Applicable elements of the QA Program shall be audited at least annually . . . with the following additional criteria to be used for modifying the audit frequency:

4. When it is suspected the safety, performance or reliability of an item is in jeopardy due to deficiencies and nonconformances with respect to the organization's QA Program;

5. When it is considered necessary to verify implementation of required corrective actions..."

The STP PSAR Section 17.0, paragraph 17.1.18B states in part, "Brown and Root, Incorporated (B&R) has established an audit system . . . for internal . . . audits. Internal audits are audits of activities of the B&R organization... B&R performs audits of all activities affecting quality, including but not limited to the following:

8. The evaluation of work areas, activities, processes, and items (hardware)

9. The review of documents and records

10. An objective evaluation of

    a. Quality related practices, procedures and instruction

    b. The effectiveness of implementation..."

The B&R QA Procedure ST-QAP 7.1 reiterates the above requirements.

a. Contrary to the above, neither the HL&P QA plan Section 8.0 nor procedure QAP-5 "Audits" include provisions to implement the above requirements concerning performance of supplemental audits.

   Furthermore, neither HL&P nor B&R (Houston) performed supplemental audits to determine if suspected safety performance or reliability of an item was in jeopardy, even though: (1) continuing allegations were received during the period from mid-1977 through 1979 relative to civil construction and inspection activities, and (2) significant voids were identified in the Unit No. 1 containment shell in early 1978 (followed just recently by the discovery of apparently similar type voids in the Unit No. 2 containment vessel shell) (pages 95, 100 and 101).

b. HL&P QA Procedure, QAP-5B in paragraph 6.2 states in part, "Objective evidence shall be examined for compliance with Quality Assurance requirements. This includes review of Quality Assurance/ Quality Control procedures and documentation which implements the Quality Assurance Program Requirements. Selected elements of the quality assurance effort shall be audited to the depth necessary to determine whether or not it is being implemented effectively."

   Contrary to the above procedure and the previously referenced PSAR and Appendix B, Criterion XVIII requirements, HL&P (Houston) failed to audit the HL&P (site) QA function to the depth necessary.

Houston audits of site QA functions were essentially a review of records and did not identify the fact that HL&P site procedures PSQCP-C and PSQP-A3 were not being effectively implemented in that nonconformances and deviations were not being identified in the civil surveillance reports (pages 99 and 104).

c. HL&P South Texas QA Plan Section 8.0, paragraph 8.2 states in part, "HL&P has the responsibility for the overall auditing of quality activities for the South Texas Project. The frequency of audits performed by HL&P . . . are generally as follows: Brown & Root site construction - annually; Brown & Root site QA/QC - semiannually."

Contrary to the above procedure and previously referenced PSAR and Appendix B, Criterion XVIII requirements, HL&P (Houston) did not audit the implementation/execution of B&R site construction procedures for the years 1977, 1978 and 1979, nor the site QA/QC procedures ST-QAP-2.7, 3.1, 3.2, 4.3, 5.3, 5.4, 5.5 and 6.1 during the years 1978 and 1979 (p. 100).

19. 10 CFR 50, Appendix B, Criterion XVIII states in part, "A comprehensive system of planned and periodic audits shall be carried out to verify compliance with all aspects of the quality assurance program and to determine the effectiveness of the program."

The STP PSAR Section 17.0, paragraph 17.1.18B states in part, "Brown & Root, Incorporated (B&R) has established an audit system . . . for internal . . . audits. Internal audits are audits of activities of the B&R organization... B&R performs audits of all activities affecting quality, including . . . The evaluation of work areas, activities, processes, and items (hardware) . . . An objective evaluation of quality related practices, procedures and instruction. The effectiveness of implementation."

B&R QA Procedure ST-QAP 7.1 reiterates the above requirements.

Contrary to the above, B&R (Houston) audits of B&R site QA/QC and construction activities were essentially only reviews of records and did not determine to the depth necessary, whether the site quality procedures were being effectively implemented. Further, no audits were conducted of site design control in 1978, although design lead time over construction was and continues to be very short and numerous Field Requests for Engineering Action and other design change documents were being processed (p. 100).

20. 10 CFR 50, Appendix B, Criterion X, requires in part, "Houston Lighting and Power Company (HL&P) will establish with each of its prime contractors... the primary inspection responsibility. HL&P, however, retains the responsibility for review, evaluation and surveillance

of the inspection procedures utilized by these organizations... HL&P requires by contract that the principal contractors... meet the requirements of 10 CFR 50, Appendix B... HL&P and/or its representative shall verify... the inspections are being performed and documented by personnel in conformance with approved procedures..."

The STP PSAR Section 17.1.10 states in part, "A program for inspection of activities affecting quality shall be established and executed . . . to verify conformance with the documented instructions, procedures, and drawings for accomplishing the activity."

Paragraph 3.22.2 of Brown & Root Procedure CCP-3 requires in part that the QC Civil Inspector ensure compliance with applicable B&R drawings by verifying that reinforcing steel is supported and tied to prevent displacement.

Contrary to the above, on December 7, 1979, although completed QC documentation indicated that the reinforcing steel for placement DG1-H1 was properly installed, a sample inspection of ten vertical tie bars, made when the placement was about 1/3 completed, identified that three of the ten were unwired (p. 53).

21. 10 CFR 50, Appendix B, Criterion III requires in part, "the design basis . . . for those structures, systems and components . . . are correctly translated into specifications, drawings, procedures, and instructions. These measures shall include provisions to assure that appropriate quality standards are specified and included in design documents and that deviations from such standards are controlled."

The STP PSAR Section 17.1 states in part, "The HL&P QA Program imposes the following design control requirements on its own activities as well as those of its principal subcontractors: . . . (3) appropriate quality standards are specified and included in the design documents, and deviations and changes from such standards are controlled. . . . (8) Design and specification changes are subject to the same design controls which were applicable to original design."

Brown & Root QA Manual, Section 3, "Design Control Procedure" reiterates the above requirements.

Contrary to the above, Brown and Root correspondence BC-22539 authorized design changes to welding requirements contained in Welding Procedures MCEP-3 and MCEP-4 and Welding Specification A01OP002 without proper review and approval. Furthermore, field welding personnel and welding inspectors were using this letter and the attached diagram as guidance for welding and inspecting (p. 74).

Each day of failure to meet the requirements of 10 CFR 50, Appendix B, constitutes a separate infraction and a penalty of $3,000 is proposed for each (cumulative civil penalties - October 1979 through January 1980 - 123 days x $3,000 = $369,000).

B. 10 CFR 50.55a(3), states in part, " . . . piping which is part of the reactor coolant pressure boundary shall meet the requirements for Class 1 components set forth in Section III of the ASME Code . . ."

ASME Section III, NB-4321 (a) states in part, " . . . shall establish the procedure and conduct the tests required by this article and by Section IX in order to qualify both the welding procedures and the performance of welders and welding operators . . ."

ASME Section IX, QW-191, states in part, " . . . the radiographic examination . . . shall meet the technique requirements of Article 2, Section V, . . ."

Paragraph T-263, Article 2 of Section V of the ASME Code, requires that a source side penetrameter be used where accessibility permits hand placement of penetrameter on the source side of the item being radiographed.

Contrary to the above, the inspector observed specimens completed by the welders and welding operators as well as the radiographs of the weld specimens which were made for qualification to weld on Class 1 components with easy accessability, containing only film side penetrameters (p. 70). On January 14, 1980, the inspector observed a weld being made on a Class 1 system, the main reactor coolant piping, by an improperly qualified welder.

This is an infraction. (Civil Penalty $3000)

Although the total civil penalties amount to $372,000, pursuant to Section 234 of the Atomic Energy Act of 1954, as amended, (42 USC 2282), the total civil penalties for any thirty-day period cannot exceed $25,000. Consequently, civil penalties in the amount of $100,000 are proposed for the above.

This Notice of Violation is sent to Houston Lighting and Power Company pursuant to the provisions of Section 2.201 of the NRC's "Rules of Practice," Part 2, Title 10, Code of Federal Regulations. Houston Lighting and Power Company is hereby required to submit to this office within twenty five (25) days of the receipt of this notice, a written statement of explanation in reply including for each item of noncompliance, (1) admission or denial of the alleged item of noncompliance; (2) the reasons for the item of noncompliance if admitted; (3) the corrective steps which have been taken and the results achieved; (4) corrective steps which will be taken to avoid further items of noncompliance; and (5) the date when full compliance will be achieved.

Houston Lighting and Power Company Docket Nos. 50-498
50-499

This office proposes to impose civil penalties pursuant to Section 234 of the Atomic Energy Act of 1954, as amended (42 USC 2282), and to 10 CFR 2.205 in the cumulative amount of One Hundred Thousand Dollars ($100,000) for the aggregate items of noncompliance set forth in Appendix A to the cover letter. In proposing to impose civil penalties pursuant to this section of the Act and in fixing the proposed amount of the penalties, the factors identified in the Statements of Consideration published in the Federal Register with the rule making action which adopted 10 CFR 2.205 (36 FR 16894), August 26, 1971, and the "Criteria for Determining Enforcement Action," which was sent to NRC licensees on December 31, 1974, have been taken into account.

The Houston Lighting and Power Company may, within twenty five (25) days of the date of this notice, pay total civil penalties in the cumulative amount of One Hundred Thousand Dollars ($100,000) or may protest the imposition of the civil penalties in whole or in part by a written answer. Should the Houston Lighting and Power Company fail to answer within the time specified, this office will issue an Order imposing the civil penalties in the amount proposed above. Should Houston Lighting and Power Company elect to file an answer protesting the civil penalties, such answer may (a) deny the items of noncompliance listed in the Notice of Violation in whole or in part; (b) demonstrate extenuating circumstances; (c) show error in the Notice of Violation; or (d) show other reasons why the penalties should not be imposed. In addition to protesting the civil penalties in whole or in part, such answer may request remission or mitigation of the penalties. Any written answer in accordance with 10 CFR 2.205 should be set forth separately from your statement or explanation in reply pursuant to 10 CFR 2.201, but you may incorporate by specific reference (e.g., giving page and paragraph numbers to avoid repetition).

The Houston Lighting and Power Company's attention is directed to the other provisions of 10 CFR 2.205 regarding, in particular, failure to answer and ensuing orders; answer; consideration by this office and ensuing orders; requests for hearings, hearings and ensuing orders; compromise; and collection.

Upon failure to pay any civil penalty due which has been subsequently determined in accordance with the applicable provisions of 10 CFR 2.205, the matter may be referred to the Attorney General, and the penalty, unless compromised, remitted, or mitigated, may be collected by civil action pursuant to Section 234c of the Atomic Energy Act of 1954, as amended, (42 USC 2282).

APPENDIX C

CROSS REFERENCES: NONCOMPLIANCES TO REPORT DETAILS

NONCOMPLIANCE	CRITERION	REPORT SECTION REFERENCE	REPORT PAGE NO.
A. 1	I	E.1.d	49
2	IX	E.3.a	61
3	XVI	E.3.c	64
4	V	E.3.a	61
5	XVII	E.3.d	65
6	XVI	E.7.d	94
7	XVI	E.2.b	53, 54
8	V	E.2.c	58
9	VI	E.4.a	69
10	IX	E.4.c.(2)(c)	72
11a	IX	E.5.b.(2)(a)	79
11b	IX	E.5.b.(2)(b)	82
11c	IX	E.5.a.(2)	76
12	V	E.5.b.(1)(a)	77
13	XVI	E.1.b.(Allegation 10A)	37
14	XVI	E.9.b.(3)	106
15	V	E.9.a.(1)	103
16	XV	E.3.f	67
17	XI	E.3.f	67
18a	XVIII	E.8.c	95
18a	XVIII	E.8.d.(2)	100
18a	XVIII	E.8.d.(3)	101
18b	XVIII	E.8.d.(1)	99, 104
18c	XVIII	E.8.d.(2)	100
19	XVIII	E.8.d.(3)	100
20	X	E.2.b	53
21	III	E.4.c.(3)(d)	74
B.	50.55(a)	E.4.b	70

NUCLEAR REGULATORY COMMISSION

In the Matter of	)	
	)	
HOUSTON LIGHTING AND POWER COMPANY	)	Docket Nos. 50-498
(South Texas Project, Units 1 & 2)	)	50-499

ORDER TO SHOW CAUSE (EFFECTIVE IMMEDIATELY)

I

The Houston Lighting and Power Company is the holder of Construction Permit Nos. CPPR-128 and CPPR-129, issued on December 25, 1975. These permits authorize, in accordance with their provisions, construction of the South Texas Project, Units 1 and 2, in Matagorda County, Texas.

II

As a result of allegations that QC inspectors were being threatened if they identified unacceptable items during concrete placements, an investigation (Report No. 50-498/77-08; 50-499/77-08) was conducted by the NRC Region IV (Arlington, Texas) Office during July 1977. Ten QC inspectors were interviewed, six stated they had experienced some harassment, but none stated that the harassment led to overlooking unacceptable items. In December 1977, an investigation (Report No. 50-498/77-14; 50-499/77-14) of an allegation that certain radiographs, mailed to a concerned citizen, revealed faulty welds, was not substantiated as the alleger was apparently the victim of a hoax. In March 1978, an investigation (Report No. 50-498/78-05; 50-499/78-05) was conducted of an allegation from an individual who felt he would become a potential

scapegoat for allowing the improper use of procedures; this allegation was not substantiated. In May 1978, an investigation (Report No. 50-498/78-09; 50-499/78-09) was conducted of allegations made by an anonymous individual that Cadweld records involving qualifications of QC inspectors were being falsified and QC inspectors were under pressure to violate inspection procedures and, thereby, not hold up construction work. There was no evidence that Cadweld records had been falsified. Interviews with QC inspectors indicated that while there was normal pressure to get the job done there was no undue pressure to violate procedures. One QC supervisor stated that his "holds" (inspection hold points) had sometimes been overruled by higher authority, but he stated this was management's prerogative and did not result from construction pressure. In July 1978, an investigation (Report No. 50-498/78-12; 50-499/78-12) was conducted of allegations made by an individual that QC Civil inspectors were inadequately trained on new procedures; the nonconformance reporting system was inadequate; QC inspectors were not given adequate support; upper management was inaccessible; and construction personnel placed undue pressure on QC inspectors. The allegations, for the most part, could not be substantiated. The investigation results did indicate apparent low morale of some QA/QC Civil inspectors and some weaknesses in the Civil QA program.

In early August 1978, Region IV reviewed the results of the past several investigations and noted that although most of the allegations were not substantiated, low morale of QC personnel was certainly evident during the investigations. This observation prompted Region IV management to conduct a

special meeting with licensee's corporate management [illegible]

corporate offices in Houston, Texas, on August 15, 1978 (Report No. 50-498/78-13; 50-499/78-13). The specific purpose of the meeting was not only to express concern about the apparent low morale of some Civil QA/QC personnel, but also to discuss apparent weaknesses in the implementation of the site QA/QC Civil program, and the adequacy of the present QA/QC staffing level. Region IV concluded the meeting by stating that although they recognized that most of the items discussed were based on allegations which were not substantiated, there was concern about certain perceived indications. Specifically, there appeared to be a morale problem in the site Civil QA/QC organization; the long QC inspector punch lists would suggest that the construction surveillance inspections by the craft foremen and field engineers were less than adequate and, thereby, placing additional pressures on QC inspectors to complete final inspections; the observations made by Region IV inspectors that Civil QC inspectors appeared to spend very little time at their desk preparing for inspections could suggest that QC inspectors have too heavy an inspection workload; finally, with regard to the adequacy of staffing, concern was expressed that the staffing plan for the current status of the project indicated that the site was below the specified QA/QC manpower level by some 21 Brown and Root personnel and by some 2 licensee personnel.

One month later, on September 15, 1978, a meeting was held in the Region IV office with licensee and Brown and Root management to further discuss commitments made by the licensee during the August 15, 1978, meeting in Houston.

Also discussed during the meeting were findings identified during the September 11-14, 1978, Region IV investigation of Cadweld irregularities which resulted in the issuance of an Immediate Action Letter on September 14, 1978, confirming a licensee imposed stop-work order on placement of concrete in the Unit 1 Reactor Containment Building. The September 15 meeting was followed by a licensee letter dated October 3, 1978 to the Region IV office which addressed the several allegations that were the subject of the July 1978 Region IV investigation that led to the special meeting with the licensee on August 15, 1978. The actions committed to by the licensee, as set forth in the October 3 letter, to correct the apparent low morale problem and strengthen the QA/QC program were included in the inspection agenda for forthcoming Region IV inspections. The results of Region IV inspections conducted during the next several months indicated that actions were being taken by the licensee to strengthen the onsite QA/QC program and improve the morale of site QC inspectors.

Region IV continued to receive allegations which were primarily directed toward site QA/QC activities. During the period August 1978 to November 1979, five investigations were conducted by Region IV. In August 1978, an investigation (Report No. 50-456/78-14; 50-499/78-14) was conducted of an alleged solicitation of bribes by a former QC inspector. The allegation, involving one man's word against another, was not substantiated. An additional allegation revealed during the investigation that QC inspectors would be adversely affected by the termination of the former QC inspector was not substantiated.

In September 1978, an investigation (Report No. 50-498/78-15; 50-499/78-15) was conducted of allegations made by a QC inspector involving installation and inspection of Cadwelds, mislocation of a Unit 2 structure and the inability of some construction foremen to read and write. Four of the thirteen allegations were substantiated, resulting in two items of noncompliance. Allegations that were substantiated included the loss of a field sketch, application of centering marks to rebar after Cadwelds were completed, lack of second shift QC inspector coverage for Cadwelding, and that only three Cadweld QC inspectors were available for Cadweld inspection. The allegation concerning mislocation of a Unit 2 structure was, in fact, a survey error which resulted in the Mechanical/Electrical Auxiliary Building concrete mat being one foot too narrow. This item had already been identified by the licensee.

In January and February 1979, an investigation (Report No. 50-498/79-01; 50-499/79-01) was conducted of allegations made by a former employee concerning installation and inspection of Cadwelds. Two of the six allegations were substantiated resulting in one item of noncompliance. Allegations that were substantiated included the copying over of dirty Cadweld Examination Checklists and entering the QC inspector's initials on the clean checklists by another person; and the acceptance of a Cadweld with excess voids in the filler metal. In May 1979, an investigation (Report No. 50-498/79-05; 50-499/79-09) was conducted of allegations concerning refusal of a QC inspector to sign a concrete pour card and widespread discrepancies in the Cadweld "as-built" location records. Both allegations were substantiated, but no items of noncompliance were identified. In September 1979, an investigation (Report No. 50-498/79-14; 50-499/79-14) was conducted of alleged intimidation of QC inspectors

by construction personnel and QA/QC program irregularities. Four of the ten allegations were substantiated resulting in an item of noncompliance and a deviation. Allegations that were substantiated, included the finding that holes were, in fact, left in walls of safety-related structures after removal of form ties; Lift 5 of the Unit 2 Reactor Containment Building contained Cadwelds that were not accounted for; an inspection report contained an unsigned and undated entry by a person other than the QC inspector; and a QC inspector was verbally instructed to disregard a stopwork notice.

In addition to the several investigations of allegations, an investigation of an altercation between a construction engineer and a QC inspector was conducted in May 1979, and was documented in Inspection Report No. 50-498/79-04; 50-499/79-04. The incident was confirmed, but licensee actions were considered appropriate and no items of noncompliance were identified.

Significant civil/structural problems identified and reported to Region IV by the licensee during 1978 and 1979, in accordance with 10 CFR Part 50.55(e), included unconsolidated concrete in the slab under the spent fuel pool in the Unit 1 Fuel Handling Building; a dimensional error in the base mat of the Unit 2 Mechanical/Electrical Auxiliary Building (MEAB2); placement of Category I backfill over a clay ramp in the MEAB2 area; concrete voids behind the liner plate in Lift 15 of the Unit 1 Reactor Containment Building (RCB) exterior

wall; and concrete voids in Lift 8 of the Unit 1 RCB wall. The voids in Lift 8 and later in other areas of the Units 1 and 2 RCB exterior walls were identified by the licensee as a result of Region IV concerns which were expressed following the discovery of the voids in Lift 15 of the Unit 1 RCB.

Region IV issued five Immediate Action Letters (IAL) to the licensee during the period January 1978 to November 1979. An IAL confirming a licensee imposed stopwork order on concrete placement in the RCB1 was issued in September 1978, The stop work resulted from problems concerning installation and inspection of Cadwelds identified during the investigation conducted in September 1978. An IAL concerning improper storage of reinforcing steel was issued in April 1979. The IAL was the result of reinforcing steel storage discrepancies identified during an inspection (Report No. 50-498/79-05; 50-499/79-05) conducted in April 1979. An IAL confirming a licensee imposed stopwork order related to placement of safety-related concrete was issued in June 1979. The stopwork order was the result of the discovery of concrete voids in Lift 8 of the Unit 1 RCB. Another IAL was issued in June 1979 which confirmed the partial release of the stopwork order for safety-related concrete but continued the stop work for RCB exterior shell wall placements. An IAL issued in September 1979 involved release of the stopwork order affecting RCB shell wall placements.

In addition to the ten investigations performed during the July 1977 to November 1979 period, a special Mid-Team QA inspection (Report No. 50-498/79-13; 50-499/79-13) was conducted during the week of August 6, 1979, on an

accelerated schedule. NRC participants in the inspection included two Region IV inspectors, the RRI designee from Region III, and an Inspection Specialist from Region II. Five items of noncompliance related to QA program implementation were identified during the inspection.

A Reactor Resident Inspector (RRI) was assigned to the South Texas Project on August 26, 1979, and assumed resident duties on September 2, 1979. On November 2, 1979, the RRI was contacted on site by a Brown and Root QC inspector who alleged that civil QC inspectors were being harassed and intimidated by Brown and Root construction personnel.

III

As a result of the allegations received on November 2, 1979, past allegations of a similar nature and repeated failures on the part of both HL&P and B&R to effectively correct poor construction practices, a special investigation effort was initiated. The purpose of this investigation effort, conducted over the period of November 10, 1979 to February 7, 1980, was to determine the validity of the recent allegations and to assess the effectiveness of the Quality Assurance/Quality Control (QA/QC) program at the South Texas Project (STP). The investigation team reporting directly to the HQ staff was comprised of an investigator and one inspector from the Region IV, one inspector each from the Region I and II offices and two from the Region III office.

The details of these findings are described in the investigation report No. 50-498/79-19 and 50-499/79-19. The items of noncompliance resulting from the special investigation are described in Appendix A of the transmittal letter of this Order.

The allegations of harassment, intimidation and lack of support of QC inspectors were substantiated during the investigation and demonstrate shortcomings in the management or poor management attitude and practices at the STP. Further, the results of the investigation establish that the QA/QC program at the South Texas Project is deficient and does not meet the standards required to assure that STP will be constructed to NRC requirements.

Procedural and programmatic inadequacies in the HL&P and B&R organization have resulted in a failure to identify quality problems and a failure to correct and prevent recurrence of identified problems. The lack of adequate control by B&R over safety-related activities and the lack of detailed involvement of HL&P in the total scope of activities associated with the STP has apparently been the reason behind these problems. This lack of detailed knowledge and involvement has hindered HL&P's ability to maintain adequate control of B&R, which for this facility is designer, constructor and provides the majority of the support personnel for the quality assurance/quality control program.

The South Texas Project QA management does not fully recognize the requirement for QA/QC organizational freedom. This is evidenced by a January 4, 1980 lecture by the B&R Project QA manager to the B&R site QA/QC and construction

and engineering supervisory personnel. This lecture which has not yet been revised repeatedly overemphasized the B&R QA/QC organization's responsibilities for minimizing project cost and maintaining the construction schedule. In addition, the lecture stressed the fact that a B&R QC inspector's decisions are subject to question, challenge and supervisory review and reversal.

The inspection of current activities and recent QA records indicate that the QA/QC program has not prevented recurrence of poor concreting practices that at times resulted in voids in structural concrete. A recent example of this was the lack of quality controls during the Unit 2 containment shell void evaluation in December 1979, which resulted in severe deformation of the containment liner.

Procedures lacking in clarity and qualitative acceptance criteria; personnel with inadequate training, experience and/or education; and production and scheduling pressures, harassment and intimidation may have contributed to this situation.

In the area of soil foundations, serious questions remain as to whether the inplace compacted backfill has met the required densities. When the licensee recently initiated a test program to provide answers to these questions, the QA/QC program failed to adequately review and control this operation, in that standard test requirements were not followed.

Although safety-related pipe welding activities are at an early stage at the STP, serious problems were identified in the areas of welder qualification, welding process controls and NDE performance and interpretation.

Improper implementation of the HL&P and B&R QA audits and surveillance programs and failure to perform continuous and effective trend analysis of site documents that record problem areas have allowed these conditions to persist.

During the review of backfill installation and testing activities two apparent false statements in the FSAR were identified regarding test and observation work actually performed. (Sections 2.5.4.5.6.2.4 and 2.5.4.5.6.2.5)

At the present time work involving complex safety-related concrete placement at the site is stopped as confirmed by an Immediate Action Letter from Region IV dated December 31, 1979 and safety related welding is stopped at the site as confirmed by an Immediate Action Letter from Region IV dated April 17, 1980. Potential for future significant construction deficiencies exist if the quality assurance program is not improved prior to proceeding to the more complex construction stages of this project.

IV

The facts set forth in parts II and III, above, reflect widespread noncompliance by the licensee and its principal contractor, Brown and Root, with 10 CFR Part 50 Appendix B, of the Commission's regulations. In view of this past record and the importance of quality assurance during construction of a nuclear power plant,

I have determined that the public health, safety, and interest requires that this Order be temporarily effective as of this date, pending further Order of the Commission.

V

A. Accordingly, pursuant to the Atomic Energy Act of 1954, as amended, and the Commission's regulations in 10 CFR Parts 2 and 50, IT IS HEREBY ORDERED THAT, the licensee, holder of Construction Permits No. CPPR-128 and No. CPPR-129, shall show cause , in the manner hereinafter provided, why safety-related construction activities on the South Texas Project, Units 1 and 2 should not be stopped ninety (90) days from the date of this Order and remain stopped until such time as the licensee completes the following items and submits in writing under oath to the Director, Office of Inspection and Enforcement information addressing each of the items:

(1) A review shall be conducted by an experienced, independent management consultant, knowledgeable in QA/QC and nuclear construction, of the licensee's management of the quality assurance program to determine whether the management of the program is adequate to exercise full control over all aspects of the South Texas Project. Consideration shall be given to the revision of organizational responsibilities to control the design, procurement and construction

activities of the licensee's prime contractor, Brown and Root, Incorporated (B&R). A discussion of the pros and cons of each concept shall be included. The alternatives considered shall include as a minimum:

(a) the present organizational structure where B&R has implemented a Quality Assurance/Control (QA/QC) Program, under the licensee,

(b) an organizational structure where all levels of the B&R QA/QC organization would report to the licensee yet remain B&R employees,

(c) an organizational structure where the licensee establishes a total QA/QC organization to conduct the current B&R QA/QC functions,

(d) an organizational structure where the licensee contracts with another independent organization to perform the current B&R QA/QC functions,

(e) an organizational structure where the licensee establishes a duplicate QA/QC organization, in whole or in part, to that of B&R with both groups performing duplicate functions.

A recommended course of action shall be defined by the licensee including the schedule for implementation. In evaluating the recommendations of the consultant in order to select the best concept, the licensee shall provide information on how it will exercise its overall responsibility for the QA/QC program including the management structure, the degree of involvement, qualifications, staff size, training, and experience. Of particular interest are the frequency and depth of participation of upper and middle management to assure that knowledge of the effectiveness of the QA/QC program is current, that such persons take the necessary actions to verify that the various QA staffs are effectively applying good QA controls, and that all personnel have the proper attitude and are applying the necessary attention to detail.

(2) A review shall be completed or new data obtained to provide information to address the following issues with respect to the Category I structural backfill:

(a) test fill program which established the soil conditions, lift thickness, compactive effort, and equipment characteristics necessary to develop the necessary in-place densities,

(b) comparison of material(s) tested and described in Section 2.5.4.8.3 of FSAR addressing liquefaction with those used in the field,

(c) the sequence of construction of existing backfill including the loose lift thickness and number of passes of the equipment,

(d) the adequacy of existing backfill material including that under structures founded on backfill,

(e) and the rationale behind the use of 18" loose lifts compacted by 8 passes of the equipment to achieve the required densities.

(3) A review shall be made of the safety-related work described below, completed as of the date of this Order to determine whether such work was properly performed. If repairs are required, describe the extent of the repairs necessary and the schedule for completion.

Also describe the manner in which the review was completed and extent of the review.

(a) Safety-related welding including civil-structural and piping.

(b) Safety-related concrete structures including embedments such as supports and the fuel transfer tube.

(4) The licensee shall cause the Brown and Root, Incorporated brochure titled, "Implementation of the Brown and Root Quality Assurance Program at the South Texas Project Jobsite," which was widely

distributed to site personnel and the subject of seminars on January 4, 1980, rescinded and the associated video tape to be destroyed or revised. Further, the licensee shall cause the republication of a new QA Program brochure which has been approved by the licensee which reflects the fundamental philosophies of 10 CFR Part 50, Appendix B, and conduct new seminars with Construction and QC personnel on the fundamental philosophies and standards of the licensee's QA Program with emphasis on the roles played by the respective personnel and the underlying purpose of the Program.

(5) The licensee shall define more clearly the stop work authority, temporary or otherwise, including implementation of the stop work authority.

(6) The licensee shall develop and implement a more effective system to provide for the identification and correction of the root causes of the nonconformances which occur.

(7) The licensee shall develop and implement a more effective system to provide for the control of field changes in order to assess the impact of the design changes on the design.

(8) The licensee shall develop and implement a more effective system of record controls.

(9) The licensee shall develop and implement an improved audit system.

(10) The licensee shall verify or correct if necessary, the FSAR statements contained in Section 2.5.4, Stability of Subsurface Materials, especially Section 2.5.4.5, Excavations and Backfill.

B. In addition, pursuant to the Atomic Energy Act of 1954, as amended, and the Commission's regulations in 10 CFR Parts 2 and 50, IT IS HEREBY ORDERED THAT:

After the responses to Section A above have been submitted, the licensee shall participate in a public meeting with the NRC in a location near the South Texas Project site to discuss the licensee's response to that section of the Order. Senior representatives of Brown and Root will be expected to participate. The Director, Region IV, will inform the licensee and members of the public at least two weeks in advance of the specific time and location of the meeting.

C. The Director, Office of Inspection and Enforcement, will review the responses to Section A, above, to determine whether safety related construction will be conducted in accordance with Appendix B of 10 CFR Part 50 of the Commission's regulations, and may take, as appropriate, further action.

VI

The licensee may file a written answer to this Order under oath or affirmation within twenty-five days of the date of this Order. Any answer filed shall specifically admit or deny each allegation made in Section II and III, above, and may set forth the matter of fact and law upon which the licensee relies. The licensee or any other person whose interest may be affected by this Order may request a hearing within twenty-five days of this Order. Any request for a hearing shall be addressed to the Director, Office of Inspection and Enforcement, U. S. Nuclear Regulatory Commission, Washington, D. C., 20555, with a copy to the Executive Legal Director at the same address. If a hearing is requested by a person whose interest may be affected by this Order, the Commission will issue an Order designating the time and place of any such hearing. Such a request for a hearing SHALL NOT STAY THE TEMPORARY-EFFECTIVENESS OF THIS ORDER. Upon failure of the licensee to file an answer within the time specified, the Director, Office of Inspection and Enforcement, will without further notice, issue an Order Suspending Construction Permit Nos. CPPR-128 and CPPR-129 if the required actions are not taken in the specified time period.

VII

In the event a hearing is held, the issue to be considered at such hearing shall be:

whether the licensee shall be required to take the actions specified in Section V(A), above, within 90 days of the date of this Order.

In the event that a need for further enforcement action becomes apparent, either in the course of the hearing or at any other time, appropriate action will be taken by the Director.

FOR THE NUCLEAR REGULATORY COMMISSION

Victor Stello, Jr.
Director
Office of Inspection
and Enforcement

Dated at Bethesda, Maryland,
this 21st day of April, 1980

Houston
Lighting
& Power
Company

Electric Tower
P.O. Box 1700
Houston, Texas 77001

May 23, 1980

Nuclear Regulatory Commission
Washington, D.C. 20555

Attention: Mr. Victor Stello, Jr.
Director
Office of Inspection and Enforcement

Re: Docket Nos. 50-498
50-499

Gentlemen:

This is filed in answer to the "Notice of Proposed Imposition of Civil Penalties" (April 30, 1980) in the subject dockets.

As indicated in the "Reply to Notice of Violation" (Reply) filed today in this docket, the items of noncompliance, as we understand them, are essentially substantiated. Accordingly, that Reply is hereby incorporated by reference, pursuant to the Notice of Proposed Imposition of Civil Penalties, and a check in the amount of $100,000 is forwarded herewith.

We shall now devote our entire attention to attacking the "root causes" of the items of noncompliance for which this penalty has been assessed while undertaking preparation of a comprehensive response to Section V of the Order to Show Cause (April 30, 1980) in the subject docket.

Very truly yours,

HOUSTON LIGHTING & POWER COMPANY

By _____
George W. Oprea, Jr.
Executive Vice President

Enclosure
cc: Attached Certificate of Service

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

IN THE MATTER OF	§	
	§	
HOUSTON LIGHTING & POWER	§	DOCKET NOS. STN-498 OL
COMPANY, ET AL.	§	STN-499 OL
	§	
(South Texas Project	§	
Units 1 and 2)	§	

CERTIFICATE OF SERVICE

I hereby certify that copies of Applicant Houston Lighting & Power Company's Answer to the Notice of Proposed Imposition of Civil Penaltities in the above-cpationed proceeding, were served on the following by deposit in the United States mail, postage prepaid, or by hand delivery this 23rd day of May, 1980:

Charles Bechhoefer, Esq., Chairman
Atomic Safety and Licensing Board
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dr. James C. Lamb, III
313 Woodhaven Road
Chapel Hill, North Carolina 27514

Dr. Emmeth A. Luebke
Atomic Safety and Licensing Board
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Mr. Chase R. Stephens
Docketing and Service Section
Office of the Secretary of the
Commission
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Melbert D. Schwarz

Dated: May 23, 1980

Houston
Lighting
& Power
Company

Electric Tower
P.O. Box 1700
Houston, Texas 77001

May 23, 1980

Nuclear Regulatory Commission
Washington, D.C. 20555

Attention: Mr. Victor Stello, Jr.
Director
Office of Inspection and Enforcement

Re: Docket Nos. 50-498
50-499

Gentlemen:

This answer is filed pursuant to Section VI of the "Order to Show Cause" (April 30, 1980) in the subject dockets. Applicants do not seek a hearing with respect to this matter.

Section VI of the "Order to Show Cause" states that any answer filed in response to the Order "shall admit or deny each allegation made in Section II and III" of the Order.

Section II essentially recounts the Nuclear Regulatory Commissions' (NRC's) Inspection and Enforcement (I&E) activity on the South Texas Project. To the extent we are aware of such activities we admit the facts as stated therein; however, there are certain matters peculiarly within the Commission's knowledge of which we are unaware and which we can neither affirm or deny (e.g. "On November 2, 1979, the RRI was contacted on site by a Brown and Root QC inspector who alleged that civil QC inspectors were being harassed and intimidated by Brown and Root construction personnel", p. 8).

It is our understanding that the allegations in Section III are, with one exception, based on the items of noncompliance specified in the "Notice of Violation" (April 30, 1980). Applicants hereby incorporate the text of their "Reply to Notice of Violation" (Reply) filed this date. It will be noted that each item of noncompliance is answered in the Reply with a clear

affirmation or denial; accordingly, we regard the matters underlying Section III as having been answered.

With respect to the one allegation that "two apparent false statements in the FSAR were identified regarding test and observation actually performed" the supporting information is not found in the Notice of Violation. This item will be addressed in the response to Section V, item 10 of the Order to Show Cause.

In response to the second paragraph on page 9, the substance of the allegation (with respect to certain incidents of harrassment and intimidation) is conceded in the response to the first item of noncompliance; we also note the extensive remedial actions which have been, and will be, implemented to prevent recurrence of these conditions. To the extent the paragraph suggests that STP may not be constructed to NRC standards, we do not believe that major nonconforming conditions exist, although the matter is under study pursuant to Section V of the Order. We note, in particular, I & E's conclusion that "during the investigation no items of major safety significance were found which related to harassment or intimidation of QC personnel." As indicated in the response to the Notice of Violation, management is committed to completion of a project conforming to NRC requirements, intends to be more involved in the program and will take steps to assure a "high visibility" for QA/QC functions.

In response to the third paragraph on page 9, clearly lack of detailed involvement by management was a contributor to the problems noted in the paragraph, but it is an overstatement to suggest that this was the only reason behind these problems. As discussed in the cover letter, the reasons for the items of noncompliance are complex, involving several "root causes." We do, believe, however, that to attack these "root causes" active involvement at the highest levels of B&R and HL&P management will be required.

In the paragraph beginning at the bottom of page 9 and continuing to page 10, the statement is made that "South Texas Project QA management does not fully recognize the requirement for QA/QC organizational freedom." As indicated in the cover letter transmitting our Reply to the Notice of Violation, management is sharply aware of the need for such

freedom and major steps have already been taken to assure this freedom and independence. The lecture referred to in the paragraph has been disavowed by B&R management. New lectures and seminars as well as written materials will emphasize the importance and status of the QA/QC function. (See also response to item 1 in the Reply to the Notice of Violation).

We believe that all other aspects of Section III are restatements of pertinent sections of the Notice of Violation which are fully answered in our Reply of this date. We note, however, that the matter of whether "serious questions" exist with backfill compaction (last paragraph, p. 10) must await completion and disposition of relevant studies mandated in Section V of the Order to Show Cause.

In accordance with the provisions of Section V of the Order to Show Cause, we will submit to the NRC within 90 days from the date of the Order the information requested in items A(1) - (10). In addition, HL&P and Brown & Root representatives will participate with the NRC in a public meeting as described in Section V B. of the Order.

Very truly yours,

HOUSTON LIGHTING & POWER COMPANY

By: George W. Oprea, Jr.
Executive Vice President

cc: Attached Certificate of Service

STATE OF TEXAS §
§
COUNTY OF HARRIS §

GEORGE W. OPREA, JR., being first duly sworn, deposes and says: That he is Executive Vice President of HOUSTON LIGHTING & POWER COMPANY, an Applicant herein; that the foregoing answer to Order to Show Cause dated April 30, 1980 has been prepared under his supervision and direction; that he knows the contents thereof; and that to the best of his knowledge and belief said answer and the facts contained therein are true and correct.

DATED: This 23rd day of May, 1980.

Signed: George W. Oprea Jr.
George W. Oprea, Jr.

Subscribed and sworn to before me this 23rd day of May, 1980.

Robin Matthews
Notary Public in and for the
County of Harris, State of Texas

My commission expires:
1-16-84

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

IN THE MATTER OF	§	
	§	
HOUSTON LIGHTING & POWER COMPANY, ET AL.	§	DOCKET NOS. STN-498 OL STN-499 OL
	§	
(South Texas Project Units 1 and 2)	§	

CERTIFICATE OF SERVICE

I hereby certify that copies of Applicant Houston Lighting & Power Company's Answer to Order to Show Cause in the above-cpationed proceeding, were served on the following by deposit in the United States mail, postage prepaid, or by hand delivery this 23rd day of May, 1980:

Charles Bechhoefer, Esq., Chairman
Atomic Safety and Licensing Board
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

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313 Woodhaven Road
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Mr. Chase R. Stephens
Docketing and Service Section
Office of the Secretary of the
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U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Melbert D. Schwarz

Dated: May 23, 1980

Houston
Lighting
& Power
Company

Electric Tower
P.O. Box 1700
Houston, Texas 77001

May 23, 1980

Nuclear Regulatory Commission
Washington, D.C. 20555

Attention: Mr. Victor Stello, Jr.
Director
Office of Inspection and Enforcement

Re: Docket Nos. 50-498
50-499

Gentlemen:

This is in response to Appendix A (Notice of Violation) to your letter of April 30, 1980, transmitting your Investigation Report (50-498/79-19; 50-499/79-19) covering the results of your inspection of the South Texas Project (STP) in the period November 10, 1979 - February 7, 1980.

Attached is a reply to each item of noncompliance addressed in the sequence specified in the Notice of Violation (keyed to the relevant Nuclear Regulatory Commission (NRC) tracking number) and providing with respect to each item an explanation in the form specified at page 19 of the Notice of Violation. Each response is preceded by a Summary which provides a brief description of the item, as perceived by the NRC, based on our review of the Investigation Report and Notice of Violation.

In some instances our review identified differences between the Notice of Violation and the Investigation Report; in other cases, the Report provided valuable amplification of the Notice of Violation. In preparing the attached reply an effort was made to address the Notice in the context of the underlying Report.

In some instances, it has proven impossible to affirm or deny statements of fact in the Report because of the absence of information which would identify persons, places and dates involved in certain items of noncompliance. This was especially true in connection with matters arising out of the alleged instances of harassment, intimidation and lack of support of

quality control inspectors by quality control management. Nevertheless, our review indicates that such instances probably did occur. As indicated in the reply to Item 1 (79-19-08), important steps have been taken in recent months to assure that QA/QC personnel have the requisite freedom and authority to identify problems and determine that they are adequately resolved, free from production pressures. Our inquiries of site personnel suggest that this concern has been brought under control. We plan further steps to reinforce our commitment to an independent quality organization with clear authority backed by management. Although we share the NRC's view that these problems did not create major deficiencies in construction already completed, we recognize that vigilance is required to assure that the underlying conditions (e.g., production pressures, insufficient QA/QC visibility) are not permitted to recur.

As to the remaining 21 instances of noncompliance, our review confirms, with minor exceptions, I&E's specific findings as set forth in the Notice of Violation. Pursuant to the Order to Show Cause, Section V, paragraph (3), a review is being made of safety-related welding and concrete structures to determine if such work was properly performed.

Our reply describes the corrective actions taken or to be taken with respect to each item of noncompliance but, in our review, we have tried to focus on the underlying or "root causes." As a consequence of that review, we have identified several areas where performance can and will be improved:

1. Translating specifications and requirements into clear and simplified procedures down to the job level.

2. Improvement of systems for documenting nonconforming conditions and systematic trend analyses to identify programmatic weaknesses.

3. Upgraded training and indoctrination of personnel at all levels in quality-related tasks with special emphasis on the project goals of reliability and safety.

4. Stronger system controls, reflected in procedures which assure that quality-related activities are initiated, controlled and properly documented.

5. Improvement of the system of audits to verify adherence to procedures and identify deficiencies for resolution at the appropriate level of management.

6. Increased visibility of, and active participation by, upper management in QA/QC activities.

Our review to date indicates that each instance of non-compliance is traceable to one or more deficiencies in the foregoing areas. This is reflected in the discussion of causes and corrective actions on each item in the attached reply. It will be our objective to attack these "root causes" over the next several months. In part, our progress will be reflected in the response to the Order to Show Cause, but we intend to advise the Office of Inspection and Enforcement in the interim as corrective steps are developed and implemented.

We recognize that these goals will be attained only with dynamic and aggressive leadership, exercised with consistency over the long term. Upper management has the responsibility to assure that quality functions have a high degree of visibility to enhance quality awareness throughout the project. We will address this matter in greater depth in our response to Section V of the Order to Show Cause and otherwise keep you advised.

Very truly yours,

HOUSTON LIGHTING & POWER COMPANY

By _____
George W. Oprea, Jr.
Executive Vice President

cc: Attached Certificate of Service

STATE OF TEXAS §
§
COUNTY OF HARRIS §

GEORGE W. OPREA, JR., being first duly sworn, deposes and says: That he is Executive Vice President of HOUSTON LIGHTING & POWER COMPANY, an Applicant herein; that the foregoing reply to the Notice of Violation dated April 30, 1980 including the attachment hereto has been prepared under his supervision and direction; that he knows the contents thereof; and that to the best of his knowledge and belief said reply and the facts contained therein are true and correct.

DATED: This 23rd day of May, 1980.

Signed: George W. Oprea, Jr.
George W. Oprea, Jr.

Subscribed and sworn to before me this 23rd day of May, 1980.

Robin Matthews
Notary Public in and for the
County of Harris, State of Texas

My commission expires:
1-16-84

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

IN THE MATTER OF	§	
	§	
HOUSTON LIGHTING & POWER COMPANY, ET AL.	§	DOCKET NOS. STN-498 OL STN-499 OL
	§	
(South Texas Project Units 1 and 2)	§	

CERTIFICATE OF SERVICE

I hereby certify that copies of Applicant Houston Lighting & Power Company's Reply to Notice of Violation in the above-cpationed proceeding, were served on the following by deposit in the United States mail, postage prepaid, or by hand delivery this 23rd day of May, 1980:

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U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Melbert D. Schwarz

Dated: May 23, 1980

79-19-08

ATTACHMENT
to letter of May 23, 1980
Responses to items of noncompliance

ITEM A-1 Lack of QA/QC freedom, independence and sufficient well defined authority

A. Summary

This item, relying basically on the statements of unidentified individuals, describes incidents of intimidation and harassment of Quality Assurance/Quality Control (QA/QC) personnel which impaired their independence and authority to identify problems and ensure that they were satisfactorily resolved.

B. Reply

(1) Affirmation or Denial

It is not possible to affirm or deny statements of fact in the absence of information which would identify persons, places and dates involved. However, our own review suggests that such instances probably did occur.

(2) Reason for item of noncompliance

The problems arose out of perceived production pressures and perceived lack of support of QA/QC personnel by quality management. Beyond these specific factors, the QA program was not given enough "visibility" and status by management, and training/indoctrination failed to place

enough emphasis on quality awareness and understanding of the purpose and intent of the QA program.

(3) Corrective actions to date and results achieved

A number of actions have been taken by Brown & Root, Inc. (B&R) and Houston Lighting & Power Company (HL&P) that are directed toward ensuring that the intent of the QA program is properly understood and implemented by project personnel. These activities are directed specifically at removing production pressures, providing positive support by management, and eliminating harassment, intimidation, and threats to inspection personnel.

(a) In January, 1980, B&R conducted a management assessment of the causes of the perception of harassment, or undue pressure on site QC personnel. Extensive interviews of construction and QA/QC personnel were conducted, and an outside consultant (Greg Howell, President of Timlapse, Inc.) was employed to survey attitudes among QA/QC and construction personnel. This assessment documented sources of friction on the site. HL&P has also increased its involvement in the QA/QC program in order to assist B&R in ensuring that the program is carried out in an effective manner. Particular attention is being directed to uncovering sources of harassment or intimidation of QA/QC personnel at the job

site. HL&P Site Surveillance is researching selected allegations of intimidation and harassment to determine their validity and causes. The effects, if any, on the quality of plant construction are being analyzed where instances are identified. HL&P audit BR-32 also included interviews with selected B&R QA/QC and construction personnel directed toward identifying any real or perceived sources of intimidation or harassment.

(b) A complete reevaluation of the B&R salary administration program for QA/QC personnel was conducted during January-February, 1980, and a revised QC salary administration program was implemented on March 30, 1980. Care was taken to ensure fair and equitable compensation for QA/QC personnel. The new salary structure should assist the QC organization in attracting additional qualified personnel to the site and help reduce personnel attrition by providing incentives.

(c) The B&R project QA/QC organization was re-evaluated during January-February, 1980, and in March, 1980, revisions to the organization were implemented including an upgraded reclassification of QC supervisory personnel to provide equal stature with their construction counterparts.

(d) B&R project management has issued a procedure, STP-PGM-02, "Procedure for Resolving Disputes Between Construction and QA/QC Personnel," rev. 0, January 7, 1980, which clearly defines a step by step process whereby any differences of opinion between construction and QC personnel are resolved through the use of successive levels of supervision in order to eliminate confrontations which could result in harassment and intimidation. The procedure has been discussed in indoctrination sessions for construction supervision and QA/QC personnel. On April 9, 1980, HL&P Site Surveillance issued a memorandum to selected HL&P and B&R personnel requesting that HL&P be promptly notified of any instances of harassment or intimidation of QC personnel.

(e) On March 27, 1980, the B&R project general manager issued a statement reiterating the mandate that project procedures, specifications and drawings be rigorously followed.

(f) In January, 1980, B&R QA management began visiting the South Texas Project (STP) site on a frequent basis for closer contact with site QA/QC personnel and to provide opportunities for employees to voice concerns and make suggestions to improve performance. On February 15-16 and February 22-23, 1980, a formal training seminar on employee motivation, human relations, and supervisory skills·

was held for construction and QA/QC supervision. This program was conducted by professors in organizational behavior management from the University of Houston.

(g) During March, a meeting was held for B&R QA/QC personnel in which B&R power group management and QA department management discussed the B&R open-door policy for all employees which provides access to top corporate management for any employee to express concerns as to any aspect of the STP operation or his personal treatment as an employee. Dedication to achieving quality objectives was emphasized.

(h) In January, 1980, the position of B&R assistant QA department manager was abolished, thereby shortening the communication chain between site QC personnel and top QA management to facilitate communication and resolution of problems.

(i) In January and February, 1980, two B&R construction supervisory personnel against whom allegations of intimidation and harassment had been made were removed from the project.

(j) In March, 1980, B&R project and QA management met with QA/QC supervision to emphasize the role of QC supervision and the importance of support of inspectors' decisions and assistance to inspectors in the resolution of

problems. As a means of observing QC support in day-to-day activities, HL&P Site Surveillance personnel have attended essentially all concrete placement meetings as well as concrete placements since early January of 1980. Surveillance personnel were requested to pay special attention to incidents of intimidation or harassment and to submit to the HL&P Site QA Supervisor written reports on observations.

(k) In March, 1980, "QA Bulletins" were instituted throughout the QA/QC department, including all site B&R QA/QC personnel, to provide better understanding of overall activities, capabilities and support within the department. The objective was to improve individual understanding of the interdependence of personnel in all project quality related activities.

(l) A program of regular refresher training of B&R construction and QA/QC personnel in project procedures has been instituted to ensure better understanding of procedures governing their work. The construction procedure delineating refresher training requirements will be complete by June 13, 1980.

(m) An extensive recruiting program has been instituted to increase the staff for the QC function (both inspectors and support personnel) to provide increased manpower for inspections, improve technical support and reduce production pressures.

(n) On May 8-9, 1980, B&R QA management conducted meetings with site QC supervisors to review NRC Report Number 79-19. B&R QA management will continue to provide additional perspective on problems, the need for better communications and proper support of inspection personnel.

(o) A complete review of B&R QA/QC personnel qualifications and recertification of those personnel, where necessary, was completed during January-April, 1980, to eliminate any doubt as to whether QA/QC personnel are properly qualified. In addition the certification requirements were made more rigorous.

(p) Extra radios have been provided to HL&P Site Surveillance personnel to enable monitoring of B&R radio traffic. These radios increase communication between HL&P and B&R construction and QA/QC personnel and have helped HL&P to evaluate the rapport between B&R construction and QA/QC personnel. Further, B&R QA/QC personnel have been provided additional radios.

(q) HL&P Site Surveillance personnel have been instructed to spend more time in the field. HL&P Site Surveillance personnel have also been provided specially marked "high visibility" hard hats. This action is aimed at increasing HL&P QA visibility in the field and lessens the probability of harassment or intimidation.

71-405 O—81——10

(r) In May, 1980, a supervisory skills course was initiated for first-line QA/QC supervision. A course was obtained from Practical Management Associates and encompasses necessary supervisory skills, and diagnosis of causes of personnel problems.

All of the above activities have been targeted at assuring the proper implementation of the QA/QC program and to remove pressures, harassment, intimidation or threats which can interfere with inspection activities. Many of these efforts are specifically designed to ensure complete support of inspection personnel by QA/QC supervision and management. Feedback has been solicited from inspection personnel with regard to the results of these efforts. Reports and comments received to date have been generally favorable.

(4) Corrective steps which will be taken to avoid further items of noncompliance

(a) The B&R Quality Engineering function at the site will be significantly strengthened to provide additional technical support for inspection personnel. An outside consultant will be retained to assist in the organization, development and implementation of these activities.

(b) The number of design engineering personnel at the project site will be significantly increased. This

should provide improved communication of the interpretation of engineering requirements.

(c) Further steps to assure "high visibility" for the QA/QC function via more direct involvement at the highest levels of management are being studied and will be reported in the response to Section V of the Order to Show Cause.

(5) The date when full compliance will be achieved

Based on the activities listed under (3), above, we believe that any perceived pressures, intimidation, harassment, or lack of support have been substantially reduced. We do not believe that such difficulties today impair the implementation of the QA program. Efforts will continue throughout the duration of the Project to ensure that the program is properly implemented. These activities will be reinforced by training and indoctrination and active participation by management in quality activities throughout the course of the project. Certain of these continuing activities will be addressed in response to Section V of the Order to Show Cause.

79-19-18

ITEM A-2 Failure to complete backfill compaction in accordance with a qualified procedure

A. Summary

A "test fill program" conducted by B&R indicated that 12 passes with compaction equipment would be required for placement of an 18 inch maximum lift thickness of soil. The construction procedure required only 8 passes.

B. Reply

(1) Affirmation or Denial

The item of noncompliance is substantiated. Engineering specifications require that all essential elements of the backfill construction procedure be identified, including lift thickness and consolidation equipment compaction passes. There is no clearly identified and documented basis for the number of passes specified in the construction procedure for 18 inch lifts.

(2) Reason for item of noncompliance

Based on consultant recommendations, the engineering specification specified formal test fill requirements only for 24 inch lifts and not for 18 inch lifts. Procedural requirements for 18 inch lifts were based on successful results of the in-place density tests. Having achieved

acceptable results from the in-place tests, construction specified that a minimum of eight passes would be required prior to testing for all lifts except for the surface lift where 12 passes would be required. It should be noted that as a result of the test fill program for 18 inch nominal lifts the necessary density was attained with 8 to 10 passes for 8-14 inch depths and after only 4 passes for 18-24 inches depth. However, the test conditions were not well documented.

(3) Corrective action to date and results achieved

A test fill program is being conducted to verify the method and criteria in the construction procedure. The history and logic of the development of the original and subsequent revisions to the procedures will be documented in response to the Order to Show Cause (Section V A, item (2)(a)). The test results obtained for the qualification of the procedures during the initial backfill placement will be retrieved insofar as possible to further substantiate the acceptability of the construction procedure. Any possible effects of the construction procedures on the adequacy of the existing backfill will be evaluated as a part of the response to the Order to Show Cause (Section V A, items 2(c) and 2(d)).

(4) Corrective action which will be taken to avoid further items of noncompliance

Although backfill placements are now substantially complete, the engineering specification will be revised to require documentation to support any change in construction procedures. This will be accomplished by June 6, 1980. The case in question, however, raises the matter of the need for care in the development of procedures to implement job specifications. This generic question will be reviewed thoroughly and progress will be reported in the response to the Order to Show Cause.

(5) Date when full compliance will be achieved

Resolution of this item of noncompliance will be final upon completion of studies mandated by Section V A, item 2 of the Order to Show Cause.

79-19-22

ITEM A-3 Failure to take prompt corrective action when test apparatus failed, halting testing

A. Summary

Notwithstanding that test apparatus for measuring relative density of soils was known to be out of commission, plant backfill continued to be placed and several sets of four sand cone density tests were completed without the requisite relative density test being performed.

B. Reply

(1) Affirmation or Denial

The item of noncompliance is substantiated.

(2) Reason for item of noncompliance

Both B&R personnel and Pittsburg Testing Laboratory (PTL) personnel were aware that the vibratory head for measuring density was out of operation but failed to document this fact on a Nonconformance Report (NCR). Efforts were underway to obtain a replacement vibratory head. In the interim, it was decided that the ultimate objective of the test could be satisfied by taking samples and placing them in the laboratory for later analysis, as supplemented by a comparative review of results of other ongoing tests. Care was taken to identify the area from which each sample was taken. This does not, however, excuse the violation.

(3) Corrective action to date and results achieved

A back-up vibratory head for measuring relative density was purchased. Where deemed necessary other PTL back-up equipment has been ordered. The more fundamental problem illustrated by this item is the failure to (a) promptly document the condition on an NCR and (b) halt production activities pending the satisfactory dispositon of the NCR. Instructions (SQA-3329 dated February 1, 1980) have been issued clarifying and strengthening the requirement to promptly document nonconforming conditions. B&R and PTL personnel have been advised as to the absolute necessity for complying with project QA/QC requirements.

(4) Corrective steps which will be taken to avoid further items of noncompliance

We will examine the need for additional indoctrination of site subcontractor personnel performing activities affecting quality.

(5) Date when full compliance will be achieved

The steps in (3) above have already been completed. Training and indoctrination will be a continuing activity, the details of which will be available to the NRC.

79-19-21

ITEM A-4 Failure to establish procedures for systematic sampling as part of soil testing program

A. Summary

Testing procedures employed by a subcontractor, Pittsburg Testing Laboratory (PTL) provided no instruction as to the depths below the backfill lift surface and location where tests should be performed. Accordingly, there was no systematic means of determining test depths and location.

B. Reply

(1) Affirmation or Denial

The item of noncompliance as reflected in the summary is substantiated.

(2) Reason for item of noncompliance

The PTL procedure left the selection of the depth of, and location for, backfill tests to the judgment of an inspector rather than providing quantitative inspection criteria for depth and location.

(3) Corrective actions to date and results achieved

The structural backfill specification has been revised (3Y069YS029-F/DCN/2-14-80) to specifically identify criteria for testing depths. The Earthwork Inspection and Testing Specification has been revised (2Y060SS033-C/DCN/2-14-80) to explicitly state the need for considering possible variations

in density with depth. These change notices formalize the judgments that previously were made by the inspectors. PTL's procedures were revised on February 19, 1980 to include the specification criteria for testing depth accompanied by necessary additional implementation instructions.

(4) Corrective steps which will be taken to avoid further items of noncompliance

The specifications and procedures will be revised to require that sample locations shall be determined by a random numbering system, based on plant grid coordinates. This action and the steps already taken and described above will solve the immediate problem. The underlying problem, however, is the adequacy of specifications and procedures to provide quantitative inspection criteria. The underlying problem will be reviewed thoroughly and progress of this review will be made available to the NRC.

(5) Date when full compliance will be achieved

Insofar as the identification of test depths for future backfill testing programs is reflected in revised specifications and procedures, compliance has already been achieved. Insofar as identification of test locations for future backfill testing, these will be reflected in revised procedures. Compliance will be achieved on June 20, 1980. However, the adequacy of past activities will not be fully assessed until completion of the studies being made in response to item 2 of Section V A of the Order to Show Cause.

79-19-24

ITEM A-5 Failure to document soil lift thickness and number of passes of equipment as part of QA records

A. Summary

The PTL procedures failed to require documentation that B&R construction procedures (which specify minimum roller passes and actual lift thickness) have been met.

B. Reply

(1) Affirmation or Denial

The item of noncompliance is substantiated.

(2) Reason for item of noncompliance

The inspection procedures as implemented by PTL only required inspection to assure that the criteria of the Structural Backfill Construction Procedure had been satisfied. There were no explicit instructions to document the exact number of roller passes.

The actual lift thickness should have been documented in inches (Item 9 of SF-1); however, the inspectors, due to the lack of specific instructions, noted the maximum allowable thickness, and by checking "acceptable" indicated that the thickness was equal to or less than the limiting criteria.

(3) Corrective action to date and results

B&R engineering specification requires the inspector to observe the number of compaction passes and lift thickness.

Although PTL had the inspection responsibility and its procedures only referred to the foregoing specifications, the PTL procedures failed to identify documentation requirements in sufficient detail. The PTL and the B&R procedure will be revised by June 20, 1980 to reflect the applicable requirements of the specification.

(4) Corrective steps which will be taken to avoid further items of noncompliance

The fundamental problem associated with this item of noncompliance is the failure to completely implement specifications and procedures in job instructions and inspection requirements. B&R and PTL's procedures will be revised to provide implementation instructions to the inspectors. A comprehensive review to assure that specifications are translated into clear procedures for the crafts, and inspection plans for QC personnel, is underway and will be an on-going effort.

(5) Date when full compliance will be achieved

Compliance will be achieved by June 20, 1980. A full evaluation of any problem associated with the deficiency and allied items of noncompliance will be reported in response to items 2c and 2d of Section V A of the Order to Show Cause.

79-19-47

ITEM A-6 Nonconformance Reports, Examination Checks/Inspection Books, and Field Requests for Engineering Action - Trend Analysis

A. Summary

The NRC Report states that no effective program has been implemented for the review and analysis of NCR's, Examination Checks/Inspection Books, or Field Requests for Engineering Action (FREA's) on a continuing basis. The concern is that "root causes" will not be identified and corrective action taken to prevent repetition of the deficiencies or nonconformances. In addition, no formal, approved procedures to implement such a program had been developed as of November 28, 1979.

B. Reply

(1) Affirmation or Denial

The item of noncompliance is substantiated. The noncompliance item points out deficiencies associated with the recurrence control program resulting from the absence of a formal program to detect discrepancy trends.

(2) Reasons for item of noncompliance

Quality Assurance Procedure ST-QAP-2.12, "Corrective Action", is the governing document on the project for recurrence control. As stated in the Scope section of this document,

"This procedure covers the methods for preventing recurrence of a nonconformity, failure, or incident by determining the cause of the adverse condition and initiating necessary corrective action."

Since mid-1978, 17 Corrective Action Requests have been issued under ST-QAP-2.12 regarding recurrence control. However, only limited analyses of nonconformance trends were performed from May 1, 1978 through September 1, 1979.

Six trend analysis reports were issued during this period, none of which identified any significant trends. In September, 1979, the supervisor responsible for trend analyses was transferred to another job, and the nonconformance trend analysis position was not filled until December, 1979. Trend analysis reports issued after September, 1979, were limited to reporting the net change in the NCR status for the reporting period.

The inadequacy of the trend analysis program can be attributed to lack of clear direction, procedures and criteria. A contributing factor was the absence of a central project authority assigned responsibility for this work.

(3) Corrective actions to date and results achieved

Three documents have been or will be developed which delegate authority for the proper handling of NCR's and FREA's for performing trend analyses, and for reviewing the results of the analyses. These documents are:

(a) STP-PGM-07, "Procedure for Trending and Reporting of FREA's, NCR's, and SDR's (Supplier Deviation Requests)." This was approved and issued for use on May 5, 1980.

(b) Procedure ST-QAP-15.4, "Nonconformance Trend Analyses" will be issued by July 14, 1980.

(c) A040GQ004-b, "Engineering Requirements for the Tracking and Trending of FREA's, NCR's, and SDR's." This was approved and issued for use on April 16, 1980.

The first trending report under the new procedures was issued April 15, 1980. This report considered all NCR's and FREA's issued to March 31, 1980. SDR's were not included in the first report, but they will be addressed in the second report. The trend analysis report will be issued quarterly.

(4) Corrective steps which will be taken to avoid further items of noncompliance

Review of the first trending report discussed above was inconclusive and thus does not provide a basis for evaluating the usefulness of the revised program. The large amount of data analyzed complicated the evaluation. Also, review of the data indicated that further effort is required to develop additional criteria for trend analyses. Further

effort is also required to bring into the program a capability for analyzing additional project documents and reports that identify problems.

In order to identify areas of the nonconformance trend analysis program that need improvement, B&R will conduct a basic reexamination of the entire program. The following items will be evaluated during this review:

a. Creation of a centralized trend analysis section that would be responsible for all project trend analyses and issuance of corrective action requests resulting from the analyses.

b. Establishing uniform codes for nonconformance problems independent of the type of document being analyzed.

c. Establishing a definitive list of documents that require trend analysis (including Examination Checklists and Inspection Books).

d. Establishing and implementing procedurally the criteria for identifying a significant nonconformance trend.

e. Establishing responsibility(ies) for analyzing and correcting root causes identified by the trend analysis program.

f. Establishing criteria and responsibility for identifying problems that may be identified only in Examination Checks/Inspection Books.

g. Training of personnel in the importance of and the proper use of effective nonconformance programs.

(5) The date when full compliance will be achieved

All corrective actions involved in this noncompliance will be further addressed in response to Section V of the Order to Show Cause.

79-19-10

ITEM A-7 Concrete Placement Activities

A. Summary

Concrete placement activities problems previously identified had not been corrected in accordance with prior commitments. These continuing problems involved proper consolidation practices, poor lighting, lack of adequate numbers of inspection personnel, production pressures and excessive lift thicknesses. These are matters previously identified as placement problems and, contrary to prior commitments, corrective action has not been incorporated into concrete placement procedures.

B. Reply

(1) Affirmation or Denial

The item of noncompliance is substantiated.

(2) Reason for the item of noncompliance

Analysis of this noncompliance shows that the problems identified above are a result of insufficient training, unsatisfactory procedures and production pressures.

(3) Corrective action to date and results achieved

The following corrective actions have been taken:

a. Production Pressure - Additional QC inspectors have been added to the Quality Control Staff to assure that

preplacement inspections are conducted in a thorough manner. Procedures have been revised to require the completion of preplacement inspection and sign off of the pour card by the B&R QC inspector prior to the delivery of concrete to the construction area. Other measures described in the response to Item 1, above, have been taken to eliminate the production pressures which might be perceived by the QC staff.

b. Inadequate lighting - Construction procedure CCP-4 has been revised to add placement lighting to the preplacement/placement checklist. This requirement is applicable to all safety-related pours.

c. Reinspection - Revisions to Site Procedures A040KPCCP-3, 4, 8, 12, 19 have been made which instruct the inspector that after he has inspected and accepted an item, if additional activity should occur in that area that would make quality of that item indeterminate or unacceptable, he shall reinspect that item and document his results on the applicable examination check.

d. Supervision - Placement foremen, field engineers and QC inspectors have been reinstructed on their obligation to identify any improper consolidation practices and to ensure that the placement receives proper consolidation.

e. Training - Procedure CCP-4 revised March 7, 1980, requires consolidation training every 90 days for consolidation placement craft. The most recent class was held April 18, 1980. These training classes emphasize consolidation procedures and ACI recommended practices.

f. Placement meetings - Construction procedure CCP-4 has been revised to require formal preplacement and postplacement meetings. The required agenda for preplacement meeting includes review and discussion of the specific placement method to be undertaken and the sequence of activities. The prescribed agenda for postplacement meetings includes discussion of all deviations from the placement as planned, including delays and required changes in the sequence of activities.

g. Procedures - Procedures are being rewritten in a new format with the involvement of the craft supervisors. These rewritten procedures will contain all relevant information from specifications, technical reference documents, codes, standards and regulatory documents. They are being written in such a way that they can be easily understood by

craft personnel. Technical terms are being replaced, whenever possible, by simpler terms or phrases.

(4) Corrective steps which will be taken to avoid further items of noncompliance

As noted above, a number of significant corrective actions have already been initiated. These efforts will continue throughout the duration of construction. Procedure CCP-4 will be revised by June 2, 1980, to reflect the requirement to discuss adherence to the specified lift thickness during each preplacement meeting. As improved methods of placing concrete are identified, they will be evaluated for incorporation into project construction procedures and training manuals.

(5) Date when full compliance will be achieved

Actions a. through f. in Section (3) above have already been accomplished. Action g. will be completed by July 21, 1980. The actions discussed in Section (4) will be an on-going project activity.

79-19-16

ITEM A-8 Failure to follow procedures with regard to qualification of civil and concrete QC inspectors

A. Summary

The qualifications of 14 B&R civil inspectors and six PTL concrete inspectors were checked against requirements in the B&R Quality Assurance Training Manual and the PTL Quality Control Procedure QC-PQ-2. The check revealed five B&R inspectors and three PTL inspectors did not have sufficient QA/QC experience at the time of their certification.

B. Reply

(1) Affirmation or Denial

The items of noncompliance have been substantiated as follows:

A total of 14 discrepancies were identified relative to the certification of B&R inspection personnel. They are summarized as follows:

A. Civil Discipline (ASME Section III Division 2 Appendix VII:

a. Two personnel did not satisfy the education requirements.

b. Two personnel did not satisfy the minimum experience requirements.

c. One of the inspectors who required a greater degree of experience possessed an unrelated college degree.

B. Nondestructive Examination Discipline (SNT-TC-1A): No discrepancies.

C. All other Disciplines (ANSI N45.2.6):

a. Five personnel did not satisfy the education requirements (i.e., verified high school education); and

b. Four personnel did not satisfy the minimum experience requirements. Two of these also failed to satisfy educational requirements.

A total of ten discrepancies were identified relative to the certification of PTL testing personnel. They are summarized as follows:

a. Five individuals were found to not be high school graduates at the time they were employed or transferred to STP for work assignments; however, they have at this time completed the required educational training through General Educational Development equivalence testing.

b. The necessary applicable prior experience background of three individuals could not be verified in writing; however, these individuals have now completed sufficient time and experience at STP to qualify for the level at which they were hired.

c. Two individuals were found to have insufficient appropriate prior experience background but now have such experience as a result of their time and work experience at STP.

(2) Reason for item of noncompliance

B&R did not to provide detailed procedures requiring documentation for verification of previous employment and education.

(3) Corrective action to date and results achieved

The education and experience of present B&R and PTL QC inspectors have been verified, and personnel have been provided additional training and recertified accordingly.

(4) Corrective action to be taken to avoid further items of noncompliance

Effective April 1, 1980, the education and experience of all B&R and PTL candidate inspectors are required to be verified prior to certification.

(5) Date when full compliance will be achieved

B&R employment practices have been revised to reflect the requirement to verify previous education and work experience for STP QA/QC personnel. We are reviewing the need for verification of education and previous work experience for site subcontractor inspection personnel. This review will be completed by July 7, 1980.

79-19-33

ITEM A-9 Failure to control documents in that contractor's QA Manual copies are out of date

A. Summary

HL&P copies of the B&R's Quality Assurance Manual did not include interim changes, and B&R Weld Filler Material Specification, 1U020WS001-E, did not contain the latest Document Change Notices (DCN's).

B. Reply

(1) Affirmation or Denial

The item of noncompliance is substantiated.

(2) Reason for item of noncompliance

The B&R QA "interim changes" procedure made tracking of latest revisions to documents difficult. Additionally, the library file clerk failed to incorporate revisions into the weld filler specification.

(3) Corrective actions to date and results achieved

The following corrective steps have been, or are being, taken.

(a) All controlled documents on file in the HL&P office have been revised by the HL&P QA file clerk and brought up-to-date as necessary.

(b) A secondary review is being be made by the HL&P QA site Quality Engineering staff to ensure that the documents are up to date. This review will be complete by June 2, 1980.

(c) To avoid further items of noncompliance an Administrative Technician has been added to the site HL&P QA staff to be responsible for document control in the HL&P QA library.

(4) Corrective steps which will be taken to avoid further items of noncompliance

The corrective actions described above should reduce the probability of recurrence. The more fundamental issue, however, is quality-related document control. The document control system, including interim changes, will be evaluated to determine what necessary changes must be made to the existing document control system.

(5) Date when full compliance will be achieved

The corrective actions outlined in (3) above will be completed by June 1, 1980. The corrective action outlined in (4) above will be completed by July 21, 1980, and results will be made available to the NRC.

79-19-34

ITEM A-10 Failure to control welding as a process with regard to cleanliness

A. Summary

NRC inspectors observed the performance of welding operations in circumstances which did not protect against contamination and adverse atmospheric conditions. Instances are documented at pages 71 and 72 of the Investigation Report.

B. Reply

(1) Affirmation or Denial

The item of noncompliance is substantiated.

(2) Reason for item of noncompliance

Procedures failed to incorporate detailed requirements for protection against adverse environmental conditions. Training and craft supervision did not sufficiently address the reasons to protect welding operations from such conditions.

(3) Corrective actions to date and results achieved

Procedures are being revised to include requirements for protection against deleterious contamination from rain, snow, wind and airborne particles during welding operations. The reasons for protecting welding operations against adverse environmental conditions were stressed in

training activities completed February 15, 1980, and the Training Department will continue to reiterate the importance of the requirement during future training of welders to B&R Material Engineering Construction Procedures. This will be done prior to start up of safety related welding activities. It has been emphasized that this is a requirement of all on-site welding activities.

(4) Corrective steps which will be taken to avoid further items of noncompliance

Welding technicians will monitor field activities with increased emphasis on this matter and report any infractions to the Chief Welding Engineer or QC. The underlying problem will be addressed by assuring that job specifications are translated to meaningful procedures and job instructions. Adherence to such instructions will be emphasized in training and indoctrination.

(5) Date when full compliance will be achieved

Procedures discussed in (3) above will be issued by July 21, 1980. Certain training activities have, as noted above, been completed. Indoctrination and training will be a part of the continuing welding improvement program.

79-19-39

ITEM A-11.a Failure to control radiography, a special process, leading to poor radiographic quality

A. Summary

At least 50 radiographs were found to display significant light fogging and chemical contamination to the extent that proper interpretation was not possible.

B. Reply

(1) Affirmation or Denial

This item of noncompliance is substantiated.

(2) Reason for item of noncompliance

Nondestructive examination (NDE) procedures did not define processing techniques or film acceptance criteria.

(3) Corrective actions to date and results achieved

All radiographic film has been reviewed by the NDE Level III to identify film discrepancies. When deficiencies were found, an NCR was issued which required reexamination of the item. Additionally, a radiographic film processing procedure (NDEP 2.2) has been issued to clarify film processing techniques.

In January, 1980, all site radiography was suspended except for that conducted under the direct supervision of the NDE Level III. Retraining and recertification of site NDE personnel was completed on February 5, 1980.

(4) Corrective steps which will be taken to avoid further items of noncompliance

QA/QC personnel will closely monitor the implementation of the revised NDE program and procedures. Training, including refresher training, will continue to ensure that site NDE personnel remain qualified. Film interpretation will be performed by qualified personnel other than the individual shooting the film.

(5) Date when full compliance will be achieved

All corrective action has been taken and full compliance has been achieved. Monitoring and training activities will be an on-going effort.

79-19-39

ITEM A-11.b Interpretation of radiographic film-weld quality

A. Summary

At least twelve radiographs of field welds and one radiograph for a welder qualification test contained linear indications that had not been recorded on the accompanying interpretation sheet.

B. Reply

(1) Affirmation or Denial

This item of noncompliance is substantiated.

(2) Reason for item of noncompliance

This noncompliance was caused by lack of clarity in existing NDE procedures, acceptance and recording criteria and improper film interpretations.

(3) Corrective actions to date and results achieved

In January, 1980, all field radiography by site QA/QC personnel was halted unless it was directly supervised by the NDE Level III. Concurrently, a review of all previously shot field weld joint radiographic film was conducted by the NDE Level III radiographer. Retraining and certification was completed for all site NDE personnel on February 5, 1980. Finally, Radiographic Procedure NDEP-2.1 has been

revised to clarify the requirements for recording film conditions and indications.

(4) Corrective steps which will be taken to avoid further items of noncompliance

All NDE procedures will be reviewed to ensure that they provide clear guidance and correct criteria for the implementation of nondestructive examination. Film interpretation will be performed by qualified personnel other than the individual actually shooting the film.

(5) Date when full compliance will be achieved

Corrective action described in (4) will be completed by July 14, 1980. Full compliance will be achieved by that date. Continuing efforts, aimed at training of personnel and assuring that procedures convey NDE requirements in a clear manner, will be a continuing Project effort.

79-19-39

ITEM A-11.c Failure to control liquid penetrant examinations

A. Summary

Liquid penetrant examinations were not conducted in accordance with procedures, nor were the results interpreted in accordance with applicable criteria, in that steps were not taken to verify that indications were not defects.

B. Reply

(1) Affirmation or Denial

The item of noncompliance is substantiated.

(2) Reason for item of noncompliance

This item of noncompliance was caused by failure of QA/QC personnel to properly follow procedures and to understand criteria for recording results of liquid penetrant examinations.

(3) Corrective actions to date and results achieved

This is believed to be an isolated incident; however, in order to address the problem in an orderly manner, all liquid penetrant examinations at the site were suspended by QA unless under the direct supervision of the NDE Level III until corrective measures could be taken. All NDE personnel conducting liquid penetrant inspections have received additional training in inspection techniques, procedures and criteria.

(4) Corrective steps which will be taken to avoid further items of noncompliance

Training will continue throughout the construction phase of the Project effort per the documented refresher training program.

(5) Date by which full compliance will be achieved

All corrective action was completed by January 31, 1980. Training and indoctrination will be a continuing activity.

79-19-41

ITEM A-12 Failure to follow procedures in that a procedure was used after an expiration date

A. Summary

Procedures governing an NDE activity were modified by an "interim" change which was to expire sixty (60) days from its issuance. The interim change was being used notwithstanding its expiration four (4) months earlier.

B. Reply

(1) Affirmation or Denial

The item of noncompliance is substantiated.

(2) Reason for item of noncompliance

Document control procedures which have proven satisfactory for formal revisions have not been adequate to provide positive control of interim changes.

(3) Corrective actions to date and results achieved

A survey of all outstanding QA "interim changes" has been conducted and outdated changes have been removed.

(4) Corrective steps which will be taken to avoid further items of noncompliance

Further revisions to the QA document control system will eliminate references to "interim changes."

(5) Date when full compliance will be achieved

Changes to the QA document control system will be completed by July 14, 1980. This should correct matters of the type described in this item of noncompliance.

79-19-03

ITEM A-13 Failure to take corrective action when cadwelders needed requalification

A. Summary

Requirements of both the FSAR and the B&R specification required requalification of any cadwelder accumulating two unacceptable production splices within a unit of 15 consecutive splices. Five cadwelders continued production without requalification after accumulating two unacceptable splices.

B. Reply

(1) Affirmation or Denial

The item of noncompliance is substantiated.

(2) Reason for item of noncompliance

The problem developed as a result of unclear specifications and procedures. B&R QC personnel felt that paragraph 5.3.3.5 of Specification 2A010CS028 should be interpreted to mean that when a cadwelder had two visual rejections within a unit of 15 consecutive shots, the cadwelder would have to be recertified. (This in fact is not the correct interpretation of the design requirements.)

(3) Corrective actions to date and results achieved

In order to correct the specific deficiency, B&R Specification 2A010CS028 has been revised. The specification now provides that when it is identified that a splicer accumulates two unacceptable tensile tests within a unit of 15 consecutive test samples, he shall not be permitted to continue splicing until he has requalified according to paragraph 5.3.3.5 of the specification. When it is identified that a splicer has accumulated two consecutive visual rejections in any one position, his next two production splices for that position shall be visually inspected (i.e., preparation and final). This clarification was incorporated into the specification with DCN 11/12/79. The five cadwelders identified on NCR 3115 were allowed to continue work. During the time clarification was being obtained, all cadwelds which were shot by these caldwelders were final inspected.

(4) Corrective steps which will be taken to avoid further items of noncompliance

The steps which have already been taken will control the immediate problem. In a larger sense, the violation suggests that there is a need to review procedures to assure that they clearly translate project specifications into understandable procedures. Attention is now being

devoted to this matter and will be a continuing Project effort.

(5) Date when full compliance will be achieved

An evaluation will be made of B&R's nonconformance procedure to determine if it adequately addresses whether work is allowed to proceed pending final disposition. This evaluation will be completed by June 16, 1980. Continuing efforts aimed at assuring that procedures reflect and convey in a clear manner project specifications will be an on-going effort.

79-19-55

ITEM A-14 Failure to take corrective action in a reasonable time and management did not get the problems resolved

A. Summary

This item cites examples of long-standing unresolved nonconformance situations identified through the B&R Site Internal Surveillance (SIS) activity. The identified SIS reports were brought to the attention of QA management but were not flagged for action by the B&R Division "Senior Group Vice President" as required by the PSAR.

B. Reply

(1) Affirmation or Denial

The item of noncompliance is substantiated.

(2) Reasons for item of noncompliance

The noncompliance resulted from the failure to translate a PSAR commitment into a B&R procedure. This was an oversight. In practice, the Group Vice President was not usually notified of delinquent responses to SIS or audit findings. Impasses in the resolution of such matters were usually escalated to the QA Manager and/or STP Project QA Manager who, in turn, initiated the action required to resolve an impasse or obtain action on a delinquent item.

(3) Corrective actions to date and results achieved

SIS report (SIS-12) has been closed, and SIS reports (SIS-18 and SIS-26) will be closed by May 30, 1980. A new audit procedure replacing STP-QAP-7.1 is now being drafted. In the interim delinquent deficiencies will continue to be escalated to senior QA Management for resolution.

(4) Corrective steps which will be taken to avoid further items of noncompliance

The new audit procedure discussed in (3) will have a section entitled "Failure to Respond" providing that if an acceptable response to an identified deficiency is not received within 30 days, a letter shall be prepared, with copies to senior QA Management and Group Vice President. In addition, the revised procedure will require notification of management via a tabulation of delinquent Audit Deficiency Reports.

As noted above, the item illustrates an instance of failure to reflect project requirements (in this case, the PSAR) into workable procedures. This underlying or root cause will be addressed as an on-going effort, progress of which will be available to the NRC.

(5) Date when full compliance will be achieved

The new audit procedure discussed above will be in place by July 14, 1980.

79-19-53

ITEM A-15 Failure to follow procedures to document and correct unsatisfactory surveillance conditions

A. Summary

Surveillances by HL&P of civil activities produced instances in which unsatisfactory conditions were not documented by HL&P personnel. A practice developed where unsatisfactory conditions were not documented if HL&P knew that B&R had initiated corrective action.

B. Reply

(1) Affirmation or Denial

The circumstances described at pages 102 and 103 of the Investigation Report are substantiated.

(2) Reason for item of noncompliance

The item of noncompliance is traceable to inadequate procedure implementation.

(3) Corrective actions to date and results achieved

Verbal instructions were given to all HL&P surveillance personnel on January 24, 1980, relative to checklist documentation of all unsatisfactory conditions. Follow-up written instructions were issued on February 1, 1980, clarifying the requirement to document all discrepancies identified during scheduled surveillance.

(4) Corrective steps which will be taken to avoid further items of noncompliance

PSQP-A3 (Discrepancy Administrative Procedure) will be revised to add criteria instructing surveillance personnel to document all unsatisfactory conditions identified during unscheduled surveillance. Complete implementation of the Site Quality Assurance Procedures will be verified by HL&P QA audits.

Future training sessions will call attention to the importance of documenting noncomforming conditions and corrective action for all job-site activities.

(5) Date when full compliance will be achieved

All actions associated with scheduled surveillance is complete and full compliance has been achieved. All corrective actions associated with unscheduled surveillance will be complete by June 1, 1980. Continuing efforts to assure that personnel properly implement procedures will continue thoughout the Project.

79-19-27

ITEM A-16 Failure to control the use of a nonconforming hammer for penetration

A. Summary

A weight ("hammer") on a soil penetration test machine used by Woodward-Lundgren (a geotechnical consulting firm) was documented as not conforming to weight specifications; yet soil penetration testing activities were allowed to continue for one week prior to disposition of this nonconforming item.

B. Reply

(1) Affirmation or Denial

The item of noncompliance is substantiated.

(2) Reason for item of noncompliance

On January 28, 1980, the date of the beginning of the soil penetration test program, the hammer and chains on the test rig was found to weigh 148.9 pounds rather than 140 pounds as required by ASTM D 1586-67, and an NCR was written by Woodward-Lundgren. Work on the testing program continued, without the NCR being dispositioned. The NCR was dispositioned on February 4, 1980.

(3) Corrective actions to date and results achieved

The NCR was fully dispositioned in accordance with the appropriate procedures. The hammer minus the chains was reweighed and found to weigh 139.8 pounds. It was determined that use of the hammer was acceptable and would have no material effect on the test program. Further, a subsequent evaluation of the use of this hammer with test data was made and found acceptable. On March 19, 1980, the consultant provided additional indoctrination to its staff to ensure proper implementation of procedures.

(4) Corrective steps which will be taken to avoid further items of noncompliance

The consultant's (Woodward-Lundgren) procedures will be revised to provide additional criteria for resolution of NCR's prior to continuing work. In addition, the consultant, by July 2, 1980, will have established a new QA monitoring function which will review and report on the resolution of nonconforming items or activities.

(5) Date when full compliance will be achieved

All corrective actions including the amendment to this consultant's procedures will be completed by July 2, 1980. We are examining the need for additional indoctrination of site subcontractor personnel performing inspection activities.

79-19-28

ITEM A-17 Failure to control the dimensions of the split spoon in soils test control

A. Summary

A split spoon used by Woodward-Lundgren (a geotechnical consulting firm) did not conform to the requirements of ASTM D 01586 in that the inside diameter of the cutting edge was measured to be 1.5 inches (rather than 1.375 inches) and the driven end of the split spoon was badly distorted and had a 0.5 inch taper.

B. Reply

(1) Affirmation or Denial

The item of noncompliance is substantiated.

(2) Reason for item of noncompliance

This noncompliance resulted from the failure of the consultant to perform proper inspection of the test equipment prior to the performance or the test. The split spoon barrel and the cutting edge were in fact nonconforming.

(3) Corrective actions to date and results achieved

The consultant's NCR has been fully dispositioned. The engineering evaluation has established that the nonconforming condition of the spoon and cutting edge had no material

effect on the results of the test program. On March 19, 1980, the consultant's staff received additional indoctrination regarding Project QA/QC requirements.

(4) Corrective steps which will be taken to avoid further items of noncompliance

Corrective action has been completed.

(5) Date when full compliance will be achieved

While the corrective action currently identified has been completed, we are examining the need for additional indoctrination of site subcontractor personnel performing activities affecting quality. The conclusions from this examination will be available to the NRC.

79-19-48
79-19-50

ITEM A-18.a Failure to provide for, and conduct, supplemental audits as part of the HL&P QA Plan and audit system

A. Summary

The HL&P Project QA Plan (PQAP) failed to identify the criteria for performing supplemental audits as required by the PSAR and by ANSI standards. Further, such supplemental audits were not performed.

B. Reply

(1) Affirmation or Denial

The item of noncompliance is substantiated. Neither the applicable HL&P PQAP procedure, QAP-5, nor the HL&P PQAP described the criteria for the performance of supplemental audits. As a result, neither HL&P nor B&R performed supplemental audits of site civil activities.

(2) Reason for item of noncompliance

The original text of the HL&P PQAP and procedures did not incorporate the PSAR commitment to conduct supplemental audits. Subsequent revisions of the PQAP and procedures also overlooked the commitment.

79-19-48
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(3) Corrective actions to date and results achieved

Section 8 of the HL&P PQAP, the HL&P auditing procedure, QAP-5, and the B&R auditing procedure, ST-QAP 18, are being revised to include the commitments of PSAR at Section 17.1.18a to establish qualitative criteria for the evaluation of audit effectiveness and the need for supplemental audits.

(4) Corrective steps which will be taken to avoid further items of noncompliance

Section 8 of HL&P PQAP, the HL&P auditing procedure, QAP-5, and B&R audit procedure, ST-QAP 18.1, will be reviewed to ensure that all applicable PSAR commitments and related criteria have been adequately addressed by the auditing program and procedures.

(5) Date when full compliance will be achieved

The PQAP and auditing procedures will be in full compliance with the PSAR commitment by July 14, 1980. Further steps aimed at ensuring the translation of project requirements into applicable procedures will be an on-going activity.

79-19-48

ITEM A-18.b Failure of HL&P to perform adequate audits in that unsatisfactory conditions were not observed

A. Summary

The HL&P QA Program was not implemented as required by the PSAR and applicable audit procedures in that HL&P failed to audit B&R site activities.

B. Reply

(1) Affirmation or Denial

The item of noncompliance is substantiated.

(2) Reason for item of noncompliance

HL&P audits of B&R site activities were limited to periodic on-site surveillance and examination of records in the belief that such activities satisfied audit requirements. Auditing functions were further impeded by insufficient time to prepare for audits and to evaluate audit findings. Further, insufficient time and personnel forced the auditors to review only documentation of previously conducted site surveillance as a means of completing the required "audits" in a timely manner.

(3) Corrective actions to date and results achieved

In November, 1979, the function of the HL&P corporate audit group was changed to minimize conflicting activities

and responsibilities of auditors. This change established a group of auditors whose primary function is to prepare and conduct audits of quality-related activities. Concurrently, auditors have been given additional training in the area of codes and standards. Finally, the HL&P auditing procedure has been revised to require more than cursory examination of documentation. Auditors must now verify procedural implementation by direct observation of quality-related activities. This activity will be supplemented by review of quality documentation.

(4) Corrective steps which will be taken to avoid further items of noncompliance

To allow the auditors more time in which to prepare and conduct audits, additional qualified auditors will be added to the present staff. Until these positions are filled by permanent personnel, HL&P will utilize the services of an outside consultant to supplement the present staff.

(5) Date when full compliance will be achieved

All corrective action will be complete by June 20, 1980. There will be a continuing program to assure that PSAR commitments and other job specifications are included in construction procedures.

79-19-48

ITEM A-18c Failure to perform audits on the prescribed frequency

A. Summary

HL&P failed to perform semiannual audits of B&R site organization and procedures and annual audits of B&R construction site activities, as required by the PSAR and applicable HL&P QA procedures.

B. Reply

(1) Affirmation or Denial

The item of noncompliance is substantiated.

(2) Reason for item of noncompliance

Historically, HL&P corporate audits of B&R site activities involved auditing the B&R site quality organization and not necessarily specific B&R construction procedures. HL&P reviewed only documentation of B&R audits of construction practices and supplemented these reviews with site surveillance. Additionally, HL&P QA management failed to recognize the requirement of the Project Quality Assurance Manual which provided for semiannual audits.

(3) Corrective actions to date and results achieved

Since March 1, 1980, the HL&P corporate audit group has been scheduling and performing audits of B&R

construction activities. HL&P auditing procedure, QAP-5B, was revised on March 31, 1980 to state that not only will objective evidence be examined to ensure compliance with QA requirements, but ". . . procedural implementation will be verified by direct observation of work being performed. . ."

(4) Corrective steps which will be taken to avoid further items of noncompliance

A matrix has been prepared which lists all applicable B&R procedures and the corresponding audit requirements. This matrix will be used to assure that procedures governing activities affecting quality are audited.

(5) Date when full compliance will be achieved

Full compliance has been achieved.

79-19-48

ITEM A-19 Failure of B&R to perform in-depth audits of site activities

A. Summary

B&R (Houston) audits of the B&R site activities were primarily a review of records, lacking in the depth necessary to determine whether or not B&R site procedures for activities affecting quality were being implemented effectively. Further an audit of site design control was not performed in 1978.

B. Reply

(1) Affirmation or Denial

The items of noncompliance are substantiated.

(2) Reason for item of noncompliance

B&R audits were ineffective due to inadequate attention by QA management, personnel turnover and inadequate numbers of experienced personnel.

(3) Corrective actions to date and results achieved

B&R has initiated the following actions to correct these problems and prevent their recurrence:

(a) The B&R audit program has been reoriented from current "procedural" audits to program/system audits following the B&R QA Manual and 10CFR50, Appendix B elements. This change

will assure that all criteria are adequately reviewed and evaluated on a periodic basis.

(b) To assure that audit schedules are met, significant additional staffing of the Houston audit section has been authorized.

(c) Meetings have been held with audit section personnel (Houston and site groups) to define in more detail what should be reviewed. Actual work in progress will be observed to verify implementation of requirements.

(d) At least one audit team member will be experienced and/or trained in the discipline being audited.

(4) Corrective steps which will be taken to avoid further items of noncompliance

HL&P will review recently implemented changes to verify that they meet quality requirements. Additional Resident Site Auditors will be appointed. Their functions will be to audit and monitor day-to-day quality, construction and engineering activities on-site, and to provide project and QA Management with prompt reports of results.

(5) Date when full compliance will be achieved

Full compliance will be achieved by July 22, 1980.

79-19-11

ITEM A-20 Failure to inspect reinforcing steel for loose rebar prior to concrete placement

A. Summary

B&R procedures require that the civil inspector verify that reinforcing steel is supported and tied to prevent displacement. Although QC documentation indicated that steel was properly installed, a sample inspection of vertical tie bars (made when the placement was about one-third completed), identified that three of the ten shear ties examined were unsecured.

B. Reply

(1) Affirmation or Denial

The item of noncompliance is substantiated.

(2) Reason for item of noncompliance

This item of noncompliance was attributable to additional traffic in this area during the placement activity and pressures upon QC personnel to quickly accept the placement conditions. However, the four civil inspectors assigned to this placement were interviewed as to the horizontal and vertical movement of rebar during the placement of concrete. Three inspectors observed no movement of rebar. One inspector observed movement and had the rebar repositioned and secured.

(3) Corrective actions to date and results achieved

Meetings have been held with QA/QC personnel to reemphasize that they are to take as much time as required to ensure that an accurate and thorough inspection is made. Revisions to Site Procedures CCP-3, 4, 8, 12, 19 have been made which instruct the inspector that if, after he has inspected and accepted an item, additional activity should occur in the inspected area that might affect quality, he shall reinspect that item and document his results on the applicable examination checklist. Corrective action to avoid excessive production pressure on QC functions and related measures discussed in the reply to item 1 will help to avoid the conditions which gave rise to this item of noncompliance. Post placement meetings are held to identify problems that may have occurred during the placement and suggestions on ways to correct these problems prior to another similar placement. Attendees at the post placement meetings are engineering, QC inspectors, and the concrete placing foreman responsible for the pour. In response to Investigation Report (page 53), an engineering assessment will be made to determine the effect of unwired shear ties on the referenced pour.

(4) Corrective steps which will be taken to prevent further items of noncompliance

The generic problem of excessive production pressures on QA/QC personnel is discussed in item 1. The corrective steps which have been taken, especially items (3)(a), (c), (h), (k) and (q), of item 1 should help to prevent situations of the type identified in this item of noncompliance. Further training and indoctrination underscoring that QC personnel will not be pressured to meet production requirements will be an on-going program.

(5) Date when full compliance will be achieved

The specific item has, as noted, been corrected. The training and indoctrination discussed in (4) will be an on-going Project activity.

ITEM A-21 Failure to control design changes in root openings and weld dimensions

A. Summary

By correspondence, B&R initiated engineering changes in certain welding procedures without complying with applicable portions of the B&R QA Manual for control of design changes.

B. Reply

(1) Affirmation or Denial

The item of noncompliance is substantiated.

(2) Reason for item of noncompliance

The item of noncompliance represents a failure to follow applicable design change controls. Applicable procedures were changed on April 9, 1980, in accordance with the requirements of the QA Manual, and the change made via the correspondence discussed above in the "Summary" is now an acceptable procedure.

(3) Corrective action taken and results achieved

As noted above, the procedural changes made by the correspondence have now been incorporated in the appropriate document. Work already performed pursuant to these procedures has been found acceptable.

(4) Corrective steps which will be taken to prevent further items of noncompliance

All administrative and technical personnel in the Welding Engineering Department and QA/QC personnel involved with design changes will be trained in the design change system, making them fully cognizant of the correct method of requesting design changes.

(5) Date when full compliance will be achieved

The training described in (4) will be completed by June 30, 1980. All welding and QA/QC personnel will receive additional training in the importance of adhering to quality requirements and following approved procedures for making design changes. This will be an on-going effort.

79-19-32

ITEM B - Failure to follow ASME B&PV Code per 10 CFR § 50.55a for radiography qualification technique

A. Summary

Procedures followed in welder qualification did not use penetrameter on the source side as required by the ASME code. Notwithstanding access for a source side penetrameter, work was done with only a film side penetrameter.

B. Reply

(1) Affirmation or Denial

The item of noncompliance is substantiated.

(2) Reason for item of noncompliance

The film side penetrameter was used based on the requirements of paragraph T-262.2 of ASME, Section V. That section discusses "inaccessibility" in regards to the placement of penetrameters. Subsection B, Article 33, SE-142, Paragraph 6 of ASME Section V provides for the use of a film side penetrameter when placement of a source side penetrameter is "impracticable." The work in question involved a welder qualification activity that was done on pipe with sufficient inside diameter (ID) to use a film side penetrameter. It was felt, however, that qualification tests should simulate field conditions where the ID might not be accessible for a

film side penetrameter. Accordingly, the provisions of ASME Section V were relied upon.

(3) Corrective actions to date and results achieved

Notwithstanding the question existing with respect to the applicable code provision, source side penetrameters will be used where permitted by ID of the piece being welded. Radiography personnel have been re-trained and re-certified to correct procedures.

(4) Corrective steps which will be taken to avoid further items of noncompliance

A comparison test will be performed to determine the difference in the results obtained using a film side penetrameter versus a source side penetrameter for radiographing welder qualification coupons. The incident reflects both a need for further indoctrination in the need to follow applicable job requirements and a need for more careful translation of job requirements and specifications into procedures and work instructions.

(5) Date when full compliance will be achieved

Full compliance is now achieved with respect to applicable RT requirements in welder qualification tests as indicated in (3). As indicated in (4), there will be an on-going program of retraining and indoctrination as well as a more careful delineation of work procedures to meet job requirements.