

**ASSESSING AMERICA'S NUCLEAR FUTURE—
A REVIEW OF THE BLUE RIBBON COMMISSION'S
REPORT TO THE SECRETARY OF ENERGY**

HEARING
BEFORE THE
**COMMITTEE ON SCIENCE, SPACE, AND
TECHNOLOGY**
HOUSE OF REPRESENTATIVES
ONE HUNDRED TWELFTH CONGRESS

SECOND SESSION

Wednesday, February 8, 2012

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**ASSESSING AMERICA'S NUCLEAR FUTURE—
A REVIEW OF THE BLUE RIBBON
COMMISSION'S
REPORT TO THE SECRETARY OF ENERGY**

WEDNESDAY, FEBRUARY 8, 2012

HOUSE OF REPRESENTATIVES,
COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY,
Washington, DC.

The Committee met, pursuant to call, at 10:00 a.m., in Room 2318 of the Rayburn House Office Building, Hon. Ralph M. Hall [Chairman of the Committee] presiding.

RALPH M. HALL, TEXAS
CHAIRMAN

EDDIE BERNICE JOHNSON, TEXAS
RANKING MEMBER

U.S. HOUSE OF REPRESENTATIVES
COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY

2321 RAYBURN HOUSE OFFICE BUILDING
WASHINGTON, DC 20515-6301
(202) 225-6371
www.science.house.gov

*Assessing America's Nuclear Future – A Review of the Blue Ribbon
Commission's Report to the Secretary of Energy*

Wednesday, February 8, 2012
10:00 a.m. to 12:00 p.m.
2318 Rayburn House Office Building

Witnesses

Lieutenant General Brent Scowcroft (Ret.), Co-Chairman, Blue Ribbon Commission
on America's Nuclear Future

The Honorable Richard Meserve, Commissioner, Blue Ribbon Commission on
America's Nuclear Future

The Honorable Pete Lyons, Assistant Secretary of Nuclear Energy, Department of
Energy

U.S. HOUSE OF REPRESENTATIVES
COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY

HEARING CHARTER

Assessing America's Nuclear Future – A Review of the Blue Ribbon Commission's Report to the Secretary of Energy

Wednesday, February 8, 2012
10:00 a.m. to 12:00 p.m.
2318 Rayburn House Office Building

Purpose

On Wednesday, February 8, 2012, at 10:00 a.m. in Room 2318 of the Rayburn House Office Building, the Committee on Science, Space, and Technology will hold a hearing entitled "*Assessing America's Nuclear Future – A Review of the Blue Ribbon Commission's Report to the Secretary of Energy*." The purpose of this hearing is to examine the recommendations contained in the Blue Ribbon Commission on America's Nuclear Future (BRC) Report to the Secretary of Energy, as well as broader science and technology issues associated with spent nuclear fuel management.

Witnesses

- **Lieutenant General Brent Scowcroft (Ret.)**, Co-Chairman, Blue Ribbon Commission on America's Nuclear Future
- **The Honorable Richard Meserve**, Commissioner, Blue Ribbon Commission on America's Nuclear Future
- **The Honorable Pete Lyons**, Assistant Secretary of Nuclear Energy, Department of Energy

Nuclear Waste Management Policy Background

All nuclear related activity, whether associated with research, commercial, military or other uses, generates waste byproducts of varying radioactivity. These byproducts range from low-level waste such as tools, equipment, and clothing to high-level waste such as used fuel and reactor components. Under the Low-Level Radioactive Waste Policy Act, first enacted in 1980 and amended in 1985, each state is responsible for low-level radioactive waste generated within its borders.¹ In contrast, the federal government is responsible to take title and dispose of high-level waste (as defined in 42 U.S.C. 10001)² under the Nuclear Waste Policy Act of 1982 (NWPA).

¹ P.L. 96-573 and P.L. 99-240.

² 42 U.S.C. §10001 Section 12 - The term "high-level radioactive waste" means - (A) the highly radioactive material resulting from the reprocessing of spent nuclear fuel, including liquid waste produced directly in reprocessing and any solid material derived from such liquid waste that contains fission products in sufficient concentrations; and (B) other highly radioactive material that the Commission, consistent with existing law, determines by rule requires permanent isolation.

Today, 104 commercial nuclear power reactors supply approximately 20 percent of U.S. electricity. Each reactor uses about 20 metric tons of uranium fuel per year, and collectively the industry creates 2,000 to 2,400 metric tons of spent fuel on an annual basis (one metric ton is about 2,200 pounds).³ This spent nuclear fuel, considered high-level waste, is currently stored at the generation site in spent fuel pools (to cool the most recently used fuel rods) or in above ground dry casks.

In addition to storage at operating nuclear reactors, spent nuclear fuel is also currently held at nine decommissioned U.S. reactor sites throughout the country.⁴ The Department of Energy (DOE) currently manages radioactive material at multiple locations in the United States. The largest site is located in Hanford, Washington followed by the Savannah River Site in South Carolina, and Idaho National Laboratory in Idaho Falls, Idaho.

*History of Waste Management Policy*⁵

For over fifty years, a deep geological repository has been examined as an option for radioactive waste disposal. The BRC notes “the conclusion that disposal is needed and that deep geologic disposal is the scientifically preferred approach has been reached by every expert panel that has looked at the issue and by every other country that is pursuing a nuclear waste management program.”⁶

In the 1970’s, the U.S. government began detailed study of specific disposal sites. In 1982, Congress passed the NWPA and provided a statutory framework to govern the disposal of U.S. high-level waste.⁷ In 1987, Congress amended the NWPA and designated Yucca Mountain as the sole location for a deep geological repository. In 2002, Congress reaffirmed the selection of Yucca Mountain as a high-level radioactive waste repository.⁸ After decades of exhaustive evaluation and study, in 2008, DOE submitted a License Application for a High-Level Waste Geologic Repository at Yucca Mountain (License Application) to the Nuclear Regulatory Commission (NRC).

In February 2010, the Department of Energy (DOE) announced its intention to withdraw the License Application for Yucca Mountain. Concurrently, the Administration moved to close the Office of Civilian Radioactive Waste Management, the office directed by the NWPA to execute DOE’s nuclear waste management programs. The NRC’s Atomic Safety and Licensing Board (ASLB) rejected DOE’s Motion to Withdraw on June 29, 2010, stating DOE did not have the authority under the NWPA to withdraw the License Application. The ASLB decision was appealed to the full Commission. In September 2011, the Commission issued a decision stating

³ “Blue Ribbon Commission on America’s Nuclear Future Report to the Secretary of Energy,” p. 14, January 2012. Accessible at: http://brc.gov/sites/default/files/documents/brc_finalreport_jan2012.pdf

⁴ A list of decommissioned sites and quantities of stranded fuel can be found in the BRC Report, p. 36.

⁵ For further information, see “Review of the Blue Ribbon Commission on America’s Nuclear Future Draft Recommendations” Joint Subcommittee Hearing Charter at

http://science.house.gov/sites/republicans.science.house.gov/files/documents/hearings/102711_charter.pdf

⁶ BRC Report p. 27

⁷ P.L. 97-425.

⁸ P.L. 107-200.

that the Commission was evenly divided on the appeal and directed the ASLB to complete all necessary and appropriate case management activities.

Until further regulatory or legal action is taken to permit the License Application to move forward or be withdrawn, it remains pending before the Commission. As a result, no long-term nuclear waste management program is currently in place. The Administration stated its intention to wait for the BRC's recommendations prior to developing a new nuclear waste management policy.

The Fiscal Year (FY) 2012 Consolidated Appropriations bill directed the Department of Energy to develop a strategy for the management of spent nuclear fuel within six months of the issuance of BRC's final report.⁹

Background on the Blue Ribbon Commission's Final Report

On January 29, 2010, President Obama issued an Executive Order directing the Secretary of Energy to establish a Blue Ribbon Commission on America's Nuclear Future to "conduct a comprehensive review of policies for managing the back of the nuclear fuel cycle, including all alternatives for the storage, processing, and disposal of civilian and defense used nuclear fuel and nuclear waste."¹⁰ The BRC states Secretary Chu "directed that the Commission was not to serve as a sitting body" and the BRC did not evaluate "Yucca Mountain or any other location as a potential site for the storage of spent nuclear fuel or disposal of high level waste."¹¹ The BRC also did not take a position on the Administration's request to withdraw the License Application.

The 15 member Commission¹² operated under the authority outlined in the Advisory Committee Charter. The BRC held numerous open meetings and site visits in an effort to operate the BRC in an "open and inclusive manner."¹³ The BRC and its subcommittees conducted 32 public events¹⁴ to inform its report. The BRC released a draft report on July 29, 2011 for a three month public comment period. Following the release of the draft report, the BRC held five regional public meetings to solicit feedback and public comment on its report and received over 2000 public comments from a wide variety of stakeholders and interested parties on all aspects considered under the BRC's charter.¹⁵ Additionally, the BRC sought outside legal opinions and commissioned 25 papers to inform its final report.¹⁶

⁹ Conference Report accompanying H.R. 2055, p. 25. Accessible at: http://rules.house.gov/Media/file/PDF_112_1/legislativetext/HR2055crSOM/psConference%20Div%20B%20-%20SOM1%20OCR.pdf

¹⁰ The White House, "Memorandum for the Secretary of Energy: Blue Ribbon Commission on America's Nuclear Future," January 29, 2010. Accessible at: <http://brc.gov/index.php?q=page/executive-order>

¹¹ Letter from BRC to the Honorable Steven Chu, January 26, 2012.

¹² Complete Membership listed in Appendix A.

¹³ Blue Ribbon Commission on America's Nuclear Future, "About the Commission." Accessible at: <http://brc.gov/index.php?q=page/about-commission>

¹⁴ The full list of meetings and events can be found at: <http://brc.gov/index.php?q=calendar/>

¹⁵ Public Comments can be found at: <http://brc.gov/index.php?q=comments>

¹⁶ A Full list of BRC Commissioned Papers is found in BRC Report Appendix D.

In addition to its explicit charge, the Commission identified a number of issues associated with nuclear waste management warranting closer consideration. For example, in November, 2011 the BRC established an Ad Hoc Subcommittee on Co-Mingling of Defense and Commercial Waste to reexamine President Reagan's decision that high level defense waste could be disposed in a repository for commercial waste as required by the NWSA. The BRC also requested legal analyses of near-term actions that could be accomplished under current statutory authority¹⁷ and issues associated with modifying the contract governing the legal relationship between DOE and utilities generating nuclear power.¹⁸

Blue Ribbon Commission Subcommittee Structure and Recommendations

The BRC was divided into three subcommittees: Reactor and Fuel Cycle Technology (RFCT), Transportation & Storage (TS), and Disposal.

The Reactor and Fuel Cycle Technology Subcommittee was formed to consider issues relating to the "evaluation of existing fuel cycle technologies and R&D programs."¹⁹ The Subcommittee specifically evaluated the options using criteria to include "cost, safety, resource utilization and sustainability, and the promotion of nuclear nonproliferation and counter-terrorism goals."²⁰ The RFCT Subcommittee submitted its draft report on June 20, 2011, centering on four key recommendations:

- (1) "provide stable, long-term [Research, Development, and Demonstration] RD&D support for advanced reactor and fuel cycle technologies," to achieve both near-term safety improvements and performance of existing light-water reactor technology and longer-term efforts to identify potential "game-changing" nuclear technologies and systems;
- (2) coordination of energy policies and programs across the federal government and more federal support for energy-related research, development, demonstration, and deployment;
- (3) additional RD&D funding for the NRC to "accelerate a regulatory framework and supporting anticipatory research for novel components of advanced nuclear energy systems;" and
- (4) continued international leadership to address global non-proliferation concerns and improve safety and security of nuclear facilities and materials worldwide.²¹

¹⁷ Van Ness Feldman, PC, "Legal Analysis of Commission Recommendations for Near-Term Actions," July 29, 2011. Accessible at: http://brc.gov/sites/default/files/documents/vnf_legal_authorities_memo_legal_authorities_memo_revised_20111011_final_clean_1.pdf

¹⁸ Van Ness Feldman, PC, "Legal Background and Questions Concerning the Federal Government's Contractual Obligations Under the 'Standard Contracts' with 'Utilities,'" December 20, 2010. Accessible at: http://brc.gov/sites/default/files/documents/20101220_standard_contract_memo_revised_final_2.pdf

¹⁹ Blue Ribbon Commission on America's Nuclear Future Advisory Committee Charter. Accessible at: <http://brc.gov/index.php?q=page/charter>

²⁰ Ibid.

²¹ Blue Ribbon Commission on America's Nuclear Future, "Reactor and Fuel Cycle Technology Subcommittee Report to the Full Commission," June 20, 2011. Accessible at: http://brc.gov/sites/default/files/documents/rfct_fullreport_rev20june11.pdf

The Transportation and Storage Subcommittee addressed the question, “[s]hould the United States change the way in which it is storing used nuclear fuel and high level waste while one or more final disposal locations are established?”²² The TS Subcommittee issued its report on May 31, 2011, focusing on seven key recommendations:

- (1) expeditiously establishing consolidated interim storage facilities;
- (2) continued research on current storage technologies;
- (3) removal of spent fuel stored at decommissioned reactor sites;
- (4) establishment of a new quasi-governmental waste management organization;
- (5) a “science-based, consent-based, transparent, phased, and adaptive” approach to “develop and implement all aspects of the spent fuel and waste management system;”
- (6) continued coordination for the transport of spent fuel and high-level waste; and
- (7) restructuring the manner in which the Nuclear Waste Fund (NWF) is accessible.²³

The Disposal Subcommittee addressed five issues contained in the BRC Charter:

- Options for permanent disposal of used fuel and/or high-level nuclear waste, including deep geological disposal;
- Options to make legal and commercial arrangements for the management of used nuclear fuel and nuclear waste in a manner that takes the current and potential full fuel cycles into account;
- Options for decision-making processes for management and disposal that are flexible, adaptive, and responsive; options to ensure that decisions on management of used nuclear fuel and nuclear waste are open and transparent, with broad participation; and
- The possible need for additional legislation or amendments to existing laws, including the Nuclear Waste Policy Act of 1982, as amended.²⁴

The Disposal Subcommittee also made seven recommendations to the BRC:

- (1) moving forward with the development of one or more permanent deep geological facilities for permanent disposal of high-level nuclear waste;
- (2) establishment of a new single-purpose organization to handle the transportation, storage, and disposal of nuclear waste;
- (3) access of that organization to the balance of the NWF;

²² Blue Ribbon Commission on America’s Nuclear Future “Transportation & Storage.” Accessible at: <http://brc.gov/index.php?q=subcommittee/transportation-storage>

²³ Blue Ribbon Commission on America’s Nuclear Future, “*Transportation and Storage Subcommittee Report to the Full Commission*,” May 31, 2011. Accessible at: http://brc.gov/sites/default/files/documents/draft_ts_report_6-1-11.pdf

²⁴ Blue Ribbon Commission on America’s Nuclear Future, “*Disposal Subcommittee Report to the Full Commission Draft*,” June 1, 2011. Accessible at http://brc.gov/sites/default/files/documents/draft_disposal_report_06-01-11.pdf

- (4) a new approach to site and develop nuclear waste management and disposal facilities in the United States that is consent-based, transparent, phased, adaptive, and standards- and science-based;
- (5) joint coordination of regulatory responsibilities and safety standards between the U.S. Nuclear Regulatory Commission and the U.S. Environmental Protection Agency;
- (6) involvement of key stakeholders, including all affected levels of government, and providing the respective stakeholders direct authority over aspects of regulation, permitting, and operations in order to protect interests and generate confidence; and
- (7) retaining the Nuclear Waste Technical Review Board for independent technical advice and review.²⁵

The full BRC incorporated the Subcommittee recommendations into eight high-level strategic recommendations:

- 1.) A new, consent-based approach to siting future nuclear waste management facilities.
- 2.) A new organization dedicated solely to implementing the waste management program and empowered with the authority and resources to succeed.
- 3.) Access to the funds nuclear utility ratepayers are providing for the purpose of nuclear waste management.
- 4.) Prompt efforts to develop one or more geologic disposal facilities.
- 5.) Prompt efforts to develop one or more consolidated storage facilities.
- 6.) Prompt efforts to prepare for the eventual large-scale transport of spent nuclear fuel and high-level waste to consolidated storage and disposal facilities when such facilities become available.
- 7.) Support for continued U.S. innovation in nuclear energy technology and for workforce development.
- 8.) Active U.S. leadership in international efforts to address safety, waste management, non-proliferation, and security concerns.²⁶

Nuclear Energy Research and Development Activities and Issues

Current DOE Nuclear Energy R&D Portfolio

The primary mission of the Office of Nuclear Energy (NE) is to “advance nuclear power as a resource capable of meeting the Nation's energy, environmental, and national security needs by resolving technical, cost, safety, proliferation resistance, and security barriers through research, development, and demonstration as appropriate.”²⁷ All of NE's R&D programs could ultimately impact long-term nuclear waste management decisions. Differing technologies will produce different forms of nuclear waste, which affect disposal options.

The FY 2012 Consolidated Appropriations bill provided NE \$769 million, a \$32 million (4.3 percent) increase above FY 2011 levels. Within the NE R&D portfolio, the primary program

²⁵ BRC Disposal Subcommittee report.

²⁶ BRC Report, p. vii.

²⁷ Department of Energy, Nuclear Energy “Our Mission.” Accessible at: <http://nuclear.energy.gov/neMission.html>

areas are fuel cycle (\$187 million) and reactor concepts (\$115 million). Additionally, the President's FY 2012 budget requested included a new NE research program for "Nuclear Energy Enabling Technologies" (NEET), which received \$75 million in FY 2012. A new Small Modular (SMR) Licensing Technical Support Program received \$67 million to partner with industry to accelerate development and licensing of SMRs necessary for commercial development.

Table 1 – Department of Energy Nuclear Energy Funding Levels (In Millions)

Major Programs	FY 2011 Enacted	FY 2012 Enacted
Reactor Concepts RD&D	169.0	115.5
Fuel Cycle R&D	359.0	187.4
LWR SMR Licensing Technical Support	0.0	67.0
Nuclear Energy Enabling Technologies	0.0	74.9
NE TOTAL*	737.1	768.7

* Total numbers do not add due to the exclusion of non-R&D activities such as facilities operations and security.

The Fuel Cycle R&D program conducts research on three basic fuel cycle technologies: once-through, modified-open, and full recycle. The Reactor Concepts program advances new reactor technologies such as high temperature gas-cooled reactors and reactors that "burn" a higher percentage of fuel. The NEET program intends to develop crosscutting technologies and transformative breakthroughs applicable to multiple reactor concepts and fuel cycle technologies. NEET also supports the Consortium for Advanced Simulation of Light Water Reactors (CASL) Energy Innovation Hub. Funded at \$24 million in FY12, the CASL Hub seeks to create a "virtual" reactor by applying supercomputing technologies to develop advanced capabilities to simulate nuclear reactors.

BRC R&D Examination

Currently all operating nuclear reactors employ the same general technology, a "once-through" light water reactor that uses nuclear fuel just once before leaving significant volumes to be placed in a pool of water to cool. Secretary Chu directed the BRC to "look at all the science and technology and all the other things that would influence how we deal with the back end of the fuel cycle." The BRC notes, "the integrated and flexible strategy that [they] propose for nuclear waste management puts a premium on creating and preserving options that could be employed

by future generations to respond to the particular circumstances they face. [Research, development, and demonstration] is a key to maximizing those options.”²⁸

However, the BRC also found that “no currently available or reasonably foreseeable reactor and fuel cycle technology developments – including advances in reprocessing and recycling technologies – have the potential to fundamentally alter the waste management challenge this nation confronts over at least the next several decades if not longer.”²⁹ The Commission did not find consensus on a particular technology pathway. Specifically, the report states:

“As a group we concluded that it is premature at this point for the United States to commit irreversibly to any particular fuel cycle as a matter of government policy given the large uncertainties that exist about the merits and commercial viability of different fuel cycles and technology options. Rather, in the face of an uncertain future, there is a benefit to preserving and developing options so that the nuclear waste management program and the larger nuclear energy system can adapt effectively to changing conditions.”³⁰

The report compares four different nuclear technology options in the context of safety, cost, sustainability, non-proliferation and counter-terrorism, and waste management. For more information, see Appendix B.

Key Issues for Committee Consideration

Three decades have passed since the NWPA was signed into law, but the Federal Government is now closer to accepting commercial spent nuclear fuel than it was in 1982. As spent fuel remains stored around the country at each reactor site, the financial liability of the Federal Government continues to steadily increase, and is estimated by DOE to be over \$20 billion if the Federal Government begins accepting waste in 2020. The BRC suggests a renewed effort to site a permanent repository could take another twenty years. The massive 2011 earthquake and tsunami that devastated Japan and led to a crisis at the Fukushima nuclear plant serve as a stark reminder of the consequences of the government’s failure to meet its obligations.

Some components of BRC’s recommended strategy can be accomplished immediately without the necessity of amending the NWPA. However, key recommendations, such as the creation of a new sole-purpose organization for managing waste and selection of a new site for a permanent repository, will require legislative action. Key questions include:

- What near-term steps should be pursued to put DOE on a path to fulfill its statutory requirement to accept and dispose of commercial spent nuclear fuel?
- How can DOE’s current research, development, and demonstration activities influence future waste management options? How can DOE better prioritize its NE RD&D programs in light of the BRC’s review?

²⁸ BRC Report, p. 99

²⁹ BRC Report, p. 100.

³⁰ BRC report, p. 101.

- How can a new single-purpose organization be structured and have the necessary resources to find a solution for nuclear waste? What would that organization's responsibilities include?
- How would a new "consent-based siting process" work in practice?

Appendix AList of Blue Ribbon Commission Members and Subcommittee Structure³¹

- **Lee Hamilton** - Co-Chair
- **Brent Scowcroft** - Co-Chair
- **Mark Ayers** - President, Building & Construction Trades Department, AFL-CIO
- **Vicky A. Bailey** - Principal, Anderson Stratton Enterprises, LLC
- **Albert Carnesale** - Chancellor Emeritus and Professor, UCLA
- **Pete V. Domenici** - Senior Fellow, Bipartisan Policy Center; former U.S. Senator (R-NM)
- **Susan Eisenhower** - President, Eisenhower Group, Inc.
- **Sen. Chuck Hagel** - Distinguished Professor, Georgetown University; Former U.S. Senator (R-NE)
- **Jonathan Lash** – President, World Resources Institute
- **Allison Macfarlane** - Associate Professor of Environmental Science and Policy, George Mason University
- **Richard A. Meserve** - President, Carnegie Institution for Science and Senior Of Counsel, Covington & Burling LLP; former Chairman, U.S. Nuclear Regulatory Commission
- **Ernie Moniz** - Professor of Physics and Cecil & Ida Green Distinguished Professor, Massachusetts Institute of Technology
- **Per Peterson** - Professor and Chair, Department of Nuclear Engineering, University of California - Berkeley
- **John Rowe** - Chairman and Chief Executive Officer, Exelon Corporation
- **Phil Sharp** - President, Resources for the Future

Reactor and Fuel Cycle Technology

Co-Chair(s):	Ex Officio(s):
Per Peterson	Brent Scowcroft
Pete V. Domenici	Lee Hamilton

Albert Carnesale
 Susan Eisenhower
 Allison Macfarlane
 Richard A. Meserve
 Ernie Moniz
 Phil Sharp

Transportation and Storage

³¹ For full biographies see: <http://brc.gov/index.php?q=commission-members>

Co-Chair(s):
Phil Sharp
Richard A. Meserve

Ex Officio(s):
Brent Scowcroft
Lee Hamilton

Mark Ayers
Vicky A. Bailey
Albert Carnesale
Pete V. Domenici
Ernie Moniz
John Rowe

Disposal
Co—Chair(s):
Chuck Hagel
Jonathan Lash

Ex officio(s):
Brent Scowcroft
Lee Hamilton

Mark Ayers
Vicky A. Bailey
Susan Eisenhower
Allison Macfarlane
Per Peterson
John Rowe

Chairman HALL. The Committee on Science, Space, and Technology will come to order. And I say good morning and welcome to today's hearing entitled "Assessing America's Nuclear Future—A Review of the Blue Ribbon Commission's Report to the Secretary of Energy." In front of you are packets containing the written testimony, biographies, and Truth-in-Testimony disclosures for today's witnesses. I recognize myself for five minutes for an opening statement.

I want to welcome everyone here today for today's hearing: "Assessing America's Nuclear Future—A Review of the Blue Ribbon Commission's Report to the Secretary of Energy." This morning, we will hear from two very distinguished members of the Blue Ribbon Commission on America's Nuclear Future, former National Security Advisor and Lieutenant General Brent Scowcroft; and former Chairman of the Nuclear Regulatory Commission, Richard Meserve. General Scowcroft and Chairman Meserve will provide an overview of the BRC's key recommendations to manage the Nation's nuclear waste.

We also will hear from the Department of Energy's Assistant Secretary for Nuclear Energy, Pete Lyons, and hope that he will explain how the Administration plans to implement the Commission's recommendations and utilize its current nuclear energy research activities to find a permanent solution to the disposal of spent nuclear fuel.

Thirty years ago, as a Democrat, I supported passage of the Nuclear Waste Policy Act of 1982. The law was intended to provide a solution to what America does with its spent fuel. And while our understanding of how to handle and dispose of spent fuel has increased dramatically in the decades since, nuclear waste is managed exactly as it was in 1982—through onsite storage at the more than 100 reactors around the country. I hope I don't have to wait another 30 years to see the government finally meet its legal obligations.

Just as real progress was being made to construct a permanent repository at Yucca Mountain, President Obama decided to change course, just as he did with the space program, without specifying any proper path. Our space program is in total disarray and we know that, and apparently, Yucca Mountain has also received the same type of death penalty. In this case, he created a Blue Ribbon Commission to reevaluate how our Nation manages the back-end of the nuclear fuel cycle. In doing so, President Obama started the whole process over—excuse me—throwing this country's nuclear waste management policy into disarray.

When the Commission's draft report came out in July, I stated that it was time to stop playing politics and move forward with the Yucca Mountain project. I echo that sentiment again today. The President dismantled the Yucca Mountain program on which, to date, the American taxpayers have spent over \$15 billion studying its scientific and technical viability to serve as a permanent geologic repository. Electricity consumers contribute approximately \$750 million into the Nuclear Waste Fund annually, and that fund now has a balance of \$27 billion. Recently, the Obama Administration revised the Federal Government's estimated liability for not accepting ownership of the radioactive waste to almost \$21 billion,

an increase of \$3.7 billion or 21 percent since creation of the Blue Ribbon Commission.

Despite this massive investment and decades of study, the Secretary of Energy explicitly prohibited the Blue Ribbon Commission from even considering the suitability of Yucca Mountain to serve as a portion of America's nuclear waste management policy, effectively tying the Commission's hands and thumbing his nose again at Congress. Despite this objectionable action by the Administration, the Commission deserves credit for highlighting in its report that every expert panel has concluded that deep geologic disposal is the scientifically preferred approach. Yucca Mountain is exactly that.

I am disappointed that the Commission was not able to even consider Yucca Mountain as part of the review, but I recognize that there are other recommendations by the Commission that could improve our nuclear waste management policy. I look forward to hearing about those.

And I thank you again for being here.

[The prepared statement of Mr. Hall follows:]

PREPARED STATEMENT OF CHAIRMAN RALPH HALL

I want to welcome everyone here for today's hearing, "*Assessing America's Nuclear Future—A Review of the Blue Ribbon Commission's Report to the Secretary of Energy.*"

This morning we will hear from two distinguished members of the Blue Ribbon Commission on America's Nuclear Future: former National Security Advisor and Lieutenant General Brent Scowcroft, and former Chairman of the Nuclear Regulatory Commission, Richard Meserve. General Scowcroft and Chairman Meserve will provide an overview of the BRC's key recommendations to manage this nation's nuclear waste.

We also will hear from the Department of Energy's Assistant Secretary for Nuclear Energy, Pete Lyons and hope that he will explain how the Administration plans to implement the Commission's recommendations and utilize its current nuclear energy research activities to find a permanent solution to the disposal of spent nuclear fuel.

Thirty years ago, I supported passage of the Nuclear Waste Policy Act of 1982. The law was intended to provide a solution to what America does with its spent nuclear fuel. While our understanding of how to handle and dispose of spent fuel has increased dramatically in the decades since, nuclear waste is managed exactly as it was in 1982—through onsite storage at the more than 100 reactors around the country. I hope I don't have to wait another thirty years to see the government finally meet its legal obligations.

Just as real progress was being made to construct a permanent repository at Yucca Mountain, Nevada, President Obama decided to change course just as he did with the space program without specifying any future path. In this case, he created a Blue Ribbon Commission to re-evaluate how our Nation manages the back end of the nuclear fuel cycle. In doing so, President Obama started the whole process over, throwing this country's nuclear waste management policy into disarray. When the Commission's draft report came out in July, I stated that it is time to stop playing politics and move forward with the Yucca Mountain project. I echo that sentiment today.

The President dismantled the Yucca Mountain program on which, to date, American taxpayers have spent over \$15 billion studying its scientific and technical viability to serve as a permanent geologic repository. Electricity consumers contribute approximately \$750 million into the Nuclear Waste Fund annually, and that fund now has a balance of \$27 billion. Recently, the Obama Administration revised the Federal government's estimated liability for not accepting ownership of radioactive waste to almost \$21 billion, an increase of \$3.7 billion or 21 percent since creation of the Blue Ribbon Commission.

Despite this massive investment and decades of study, the Secretary of Energy explicitly prohibited the Blue Ribbon Commission from even considering the suitability of Yucca Mountain to serve as a portion of America's nuclear waste management policy—effectively tying the Commission's hands and thumbing his nose at Congress. Despite this objectionable action by the Administration, the Commission

deserves credit for highlighting in its report that every expert panel has concluded that deep geologic disposal is the scientifically preferred approach.

Yucca Mountain is exactly that.

I am disappointed that the Commission was not able to even consider Yucca Mountain as part of its review, but I recognize that there are other recommendations by the Commission that could improve nuclear waste management policy. I look forward to hearing about those.

Thank you again for being here. I now recognize Ranking Member Johnson for five minutes.

Chairman HALL. I now recognize Ranking Member Johnson for five minutes.

Ms. JOHNSON. Thank you very much, Chairman Hall, and good morning to all. I want to thank General Scowcroft, Dr. Meserve, and their fellow Commissioners for their service to this country. Given the diversity of backgrounds and expertise on the Commission, arriving at a consensus on something as potentially contentious as our nuclear future is not easy and your efforts should be considered in itself a model for how to move forward on this issue.

To some degree, this reflects how the national conversation regarding nuclear energy has evolved over the last three years. Once a highly polarizing and partisan debate with ardent pro- and anti-nuclear camps firmly entrenched on either side, we can now have more nuanced policy discussions on everything from environmental impacts to financial issues. As a supporter of nuclear energy, I do find this encouraging. However, one thing has not changed. After five decades of commercial nuclear power in the United States, we still have not arrived at a comprehensive and equitable plan for permanent disposal of spent nuclear fuel. Yucca Mountain has never fit in that bill. It was a decision forced upon Nevada by Congress and it was only a partial solution at best. For this reason, I welcome the Blue Ribbon Commission's final report. It represents the strongest effort to date to move the United States beyond what is arguably one of the most embarrassing policy failures and one that has spanned both Democrat and Republican administrations.

Today, we are at an impasse, a stalemate, and we should have seen this coming. In 1987, the process was short-circuited and ultimately it broke down. It has cost us 30 years of progress and billions of dollars. It was always controversial and unfair, and in the end, we are left frustrated and angry with an ever-growing waste stockpile and still without a solution. Regardless of one's personal feelings about Yucca's suitability as a repository, to spend our time and resources rehashing the same arguments reminds me of the often-quoted definition of insanity—doing the same thing over and over again expecting different results. I hope we will not go down that road today. It is time to move on and try a new approach, one that seeks to gain consensus from the start by educating the public, empowering stakeholder communities.

I applaud the Commission for having this as their number one recommendation. They have called for a consent-based approach to identifying a permanent nuclear waste repository and they acknowledge that the decisions three decades ago regarding Yucca Mountain were not purely technical or scientific but political despite vocal and vibrant community opposition. What we need is consensus from the start. In the most powerful democracy in the world, it is the only way this will work. And as the most innovative

economy in the world, we cannot forget the role that future technologies may play in both reducing our waste stockpile and ensuring the safety of future generations.

The Blue Ribbon Commission has given us a framework for this new approach. Some recommendations can be implemented in the near term and some may take decades to fully realize. All of them deserve our attention and consideration today.

Thank you, Mr. Chairman, and I yield back.

[The prepared statement of Ms. Johnson follows:]

PREPARED STATEMENT OF RANKING MEMBER EDDIE BERNICE JOHNSON

Thank you, Chairman Hall, for calling this hearing today.

I also want to thank General Scowcroft, Dr. Meserve, and their fellow Commissioners for their service to the country. Given the diversity of backgrounds and expertise on the Commission, arriving at a consensus on something as potentially contentious as our nuclear future is not easy, and your effort should be considered, in itself, a model for how to move forward on this issue.

To some degree, this reflects how the national conversation regarding nuclear energy has evolved over the last few years. Once a highly polarizing and partisan debate—with ardent “pro” and “anti” nuclear camps firmly entrenched on either side—we can now have more nuanced policy discussions on everything from environmental impacts to financing issues. As a supporter of nuclear energy, I find this encouraging.

However, one thing has not changed: after five decades of commercial nuclear power in the U.S., we still have not arrived at a comprehensive and equitable plan for permanent disposal of spent nuclear fuel. Yucca Mountain has never fit that bill. It was a decision forced upon Nevada by Congress, and it was only a partial solution at that.

For this reason, I welcome the Blue Ribbon Commission’s final report. It represents the strongest effort to date to move the U.S. beyond what is arguably one of our most embarrassing policy failures, and one that has spanned both Democratic and Republican Administrations. Today we are at an impasse, a stalemate, and we should have seen this coming.

In 1987, the process was short-circuited, and ultimately, it broke down. It has cost us thirty years of progress and billions of dollars. It was always controversial and unfair, and in the end we are left frustrated and angry, with an ever-growing waste stockpile, and still without a solution.

Regardless of one’s personal feelings about Yucca’s suitability as a repository, to spend our time and resources rehashing the same arguments reminds me of the often-quoted definition of “insanity”: doing the same thing over and over again and expecting different results. I hope we will not go down that road again, today.

It is time to move on and try a new approach, one that seeks to gain consensus from the start by educating the public and empowering stakeholder communities. I applaud the Commission for having this as their number one recommendation. They have called for a “Consent-Based Approach” to identifying a permanent nuclear waste repository and they acknowledged that the decisions three decades ago regarding Yucca Mountain were not purely technical or scientific, but political, despite vocal and vibrant community opposition. What we need is consensus from the start. In the most powerful democracy in the world, it is the only way this will work.

And, as the most innovative economy in the world, we cannot forget the role that future technologies may play in both reducing our waste stockpile and ensuring the safety of future generations.

The Blue Ribbon Commission has given us a framework for this new approach. Some recommendations can be implemented in the near term, and some may take decades to fully realize. All of them deserve our attention and consideration today. Thank you, Mr. Chairman, and I yield back.

Chairman HALL. All right. I thank you, Ms. Johnson. The gentlelady from Texas yields back.

If there are Members who wish to submit additional opening statements, your statements will be added to the record at this point.

And I am honored to get to introduce the witnesses at this time. I want to introduce our panel of witnesses, and our first witness is retired General Brent Scowcroft, United States Air Force, and the Co-Chairman of the Blue Ribbon Commission on America's Nuclear Future. General Scowcroft currently is the President of the Scowcroft Group, an international business advisory firm. General Scowcroft served as the National Security Advisor to Presidents Gerald Ford and George H. W. Bush. President Bush presented the General with the Medal of Freedom Award in 1991, the Nation's highest civilian award.

Our second witness is the Honorable Richard Meserve, Commissioner of the Blue Ribbon Commission on America's Nuclear Energy Future. Dr. Meserve is the President of the Carnegie Institution for Science. Before joining Carnegie, Dr. Meserve was Chairman of the Nuclear Regulatory Commission. He served as Chairman under both Presidents Clinton and George W. Bush and led the NRC in responding to the terrorism threat that came to the forefront after the 9/11 attacks. Before joining the NRC, Dr. Meserve was a partner in the Washington, D.C. law firm of Covington & Burling.

Our final witness is the Honorable Pete Lyons, Assistant Secretary of Nuclear Energy for the Department of Energy. Dr. Lyons was confirmed by the Senate as Assistant Secretary for Nuclear Energy on April 14, 2011. Dr. Lyons previously served as Principal Deputy Assistant Secretary of the Office of Nuclear Energy. Dr. Lyons was a Commissioner of the Nuclear Regulatory Commission from 2005 to 2009. He also served as the Science Advisor for Senator Pete Domenici for the Senate Energy and Natural Resources Committee. Dr. Lyons worked at the Los Alamos National Laboratory for nearly 30 years.

As our witnesses should know, spoken testimony is limited to five minutes after which the Members of the Committee will have five minutes each to ask questions.

I am going to recognize General Scowcroft and Dr. Meserve together for ten minutes. You can divide that any way you want to. I am honored to recognize you at this time, sir.

**STATEMENT OF LIEUTENANT GENERAL BRENT SCOWCROFT
(RET.), CO-CHAIRMAN, BLUE RIBBON COMMISSION
ON AMERICA'S NUCLEAR FUTURE**

General SCOWCROFT. Chairman Hall, Ranking Member Johnson, distinguished Members of the Committee, it is a great pleasure to appear before you today to discuss the final recommendations of the Blue Ribbon Commission on America's Nuclear Future. We appreciate the leadership this Committee has shown in confronting some of our Nation's biggest challenges, which certainly include the focus of this hearing: managing spent nuclear fuel and high-level nuclear waste in the United States. Thank you for allowing us to testify.

Before we begin, I would like to pass along the deepest regrets of my Co-Chairman, former Congressman Hamilton, for not being here with us today. It has been an absolute delight working with him. Both Congressman Hamilton and I are thankful that Dr. Richard Meserve could stand in his place today. I would also like

to thank the rest of the members of the Commission who worked so hard in creating our final report. Congressman Hamilton and I were delighted to work with such a talented and dedicated work group of fellow Commissioners. We are thankful for the expertise and insights they brought to our endeavors. Despite the variety of perspectives and interests in this issue of the members of the Commission, their professionalism led to our final report having unanimous approval, a fact which we believe speaks to the strength of our recommendations. We are also fortunate to have the services of an absolutely outstanding staff.

As you are aware, Blue Ribbon Commission was formed by the Secretary of Energy at the direction of the President. Our charge was to conduct a comprehensive review of policies for managing the back-end of the nuclear fuel cycle and to recommend a new strategy. We came away from our review frustrated by decades of unmet commitments to the American people, yet confident that we can turn this record around.

I will present the first half of our recommendations and Dr. Meserve will continue from there.

Mr. Chairman, as we are all too aware, America's nuclear waste program is at an impasse. The Administration's decision to halt work on a repository at Yucca Mountain is but the latest indicator of a policy that has been trouble for decades and has now all but completely broken down. The approach laid out under the 1987 amendments to the Nuclear Waste Policy Act has simply not worked to produce a timely solution for dealing with the Nation's most hazardous radioactive materials. The United States has traveled nearly 25 years down the current path only to come to a point where continuing to rely on the same approach seems destined to bring further controversy, litigation, and delay.

What we have found is that our Nation's failure to come to grips with the nuclear waste issue has already proved damaging and costly. It will be even more so the longer it continues, damaging the prospects for maintaining a potentially important energy supply option for the future, damaging to state/federal relations and public confidence in the Federal Government's competence, and damaging to America's standing in the world as a source of nuclear expertise and as a leader on global issues of nuclear safety, non-proliferation, and security.

This failure is also costly to utility ratepayers, who continue to pay for a nuclear waste management solution that has yet to be delivered, to communities that have become unwilling hosts of long-term waste storage facilities, and to U.S. taxpayers who face billions in liabilities as a result of the failure to meet federal waste management commitments. The national interest demands that our nuclear waste program be fixed. Complacency with a failed nuclear waste management system is not an option. With a 65,000 metric ton inventory of spent nuclear fuels spread across the country and growing at a rate of over 2,000 metric tons a year, the status quo is not acceptable. The need for a new strategy is urgent.

Mr. Chairman, the strategy we recommend in our final report has eight key elements. We are certain they are all necessary to establish a truly integrated national nuclear waste management system, to create the institutional leadership and wherewithal to

get the job done, and to ensure that the United States remains at the forefront of technological developments and international responses to evolving safety—nuclear safety, nonproliferation, and security concerns. We will now describe those eight elements in more detail.

The first is a new consent-based approach to siting future nuclear waste management facilities. Experience in the United States and in other nations suggest that any attempt to force a top-down federally mandated solution over the objections of a state or a community, far from being more efficient, will take longer, cost more, and have lower odds of ultimate success. By contrast, the approach we recommend is explicitly adaptive, staged, and consent-based. Based on activities in the United States and abroad—including most notably the siting of a disposal facility for transuranic radioactive waste, the Waste Isolation Pilot Plant (WIPP) in New Mexico, and recent positive outcomes in Spain, Finland, and Sweden—we believe this type of approach can provide the flexibility and sustain the public trust and confidence needed to see controversial facilities through to completion.

The second element is a new organization dedicated solely to implementing the waste management program and empowered with the authority and resources to succeed. The overall record of DOE and of the Federal Government as a whole has not inspired confidence or trust in the Nation's nuclear waste management program. For this and other reasons, the Commission concludes that new institutional leadership is needed. Specifically, we believe a single-purpose congressionally chartered federal corporation is best suited to provide the stability, focus, and credibility needed to get the waste program back on track. For the new organization to succeed, a substantial degree of implementing authority and assured access to funds must be paired with a rigorous financial, technical, and regulatory oversight by Congress and the appropriate government agencies.

The third element is access to the funds nuclear utility ratepayers are providing for the purpose of nuclear waste management. Nuclear utilities are assessed a fee on every kilowatt-hour of nuclear-generated electricity in exchange for the Federal Government's contractual commitment to begin accepting commercial-spent fuel beginning by January 31, 1998. Fee revenues go to the government's Nuclear Waste Fund, which was established for the sole purpose of covering the cost of disposing of civilian nuclear waste and ensuring that the waste program would not have to compete with other funding priorities. The fund does not work as it can. A series of Executive Branch and Congressional actions has made the annual fee revenues—approximately \$750 million a year—and the unspent \$27 billion balance in the funds effectively inaccessible to the waste program. Instead, the waste program is subject to precisely the budget constraints and uncertainties that the fund was created to avoid. This situation must be remedied immediately to allow the program to succeed.

**STATEMENT OF THE HONORABLE RICHARD MESERVE,
COMMISSIONER, BLUE RIBBON COMMISSION
ON AMERICA'S NUCLEAR FUTURE**

Mr. MESERVE. As General Scowcroft has indicated, we have eight major recommendations, and he has covered the first three and I will cover the remainder.

Our fourth recommendation is that there be prompt efforts to develop one or more geologic disposal facilities. The conclusion that disposal is needed and that deep geologic disposal is the scientifically preferred approach has been reached by every expert panel that has looked at the issue and by every other country that is pursuing a nuclear waste management program. Moreover, all spent fuel reprocessing or recycle options either already available, or under active development at this time, still generate waste streams that require a permanent disposal solution. We simply note that regardless of what happens with Yucca Mountain, the U.S. inventory of spent nuclear fuel will soon exceed the amount that can be legally in place at this site until a second repository is in operation.

So under current law, the United States will need to find a disposal site even if Yucca Mountain were to move forward. We believe the approach set out here in our recommendations provides the best strategy for assuring continued progress regardless of the fate of Yucca Mountain.

Our fifth recommendation is to assure prompt efforts to develop one or more consolidated storage facilities. Developing consolidated storage capacity would allow the Federal Government to begin the orderly transfer of spent fuel from reactor sites to safe and secure centralized facilities independent of the schedule for operating a permanent repository. The arguments in favor of consolidated storage are strongest for stranded spent fuel from shutdown plant sites of which there are 10 across the country. Stranded fuel should be first in line for transfer to a consolidated storage facility so that these plant sites can be completely decommissioned and put to other beneficial uses. The availability of consolidated storage will also provide valuable flexibility in the nuclear waste management system that could achieve meaningful cost savings, provide backup storage in the event that spent fuel needs to be moved quickly and would provide an excellent platform for ongoing R&D to better understand how the storage systems currently in use at both commercial and DOE sites perform over time.

Our sixth recommendation is that prompt efforts be undertaken to prepare for the eventual large-scale transport of spent nuclear fuel and high-level waste to consolidated storage and disposal facilities when such facilities become available. The current system of standards and regulations governing the transport of spent fuel and other nuclear materials has functioned well and the safety record for past shipments of these types of materials is excellent. That being said, greater transport demands for nuclear materials are likely to raise new public concerns. The Commission believes that state, tribal, and local officials should be extensively involved in transportation planning and should be given the resources necessary to discharge their roles and obligations in this arena. Historically, some programs have treated transportation planning as an afterthought. No successful programs have done so.

Our seventh recommendation is to support advances in nuclear energy technology and workforce development. Advances in nuclear energy technology have the potential to deliver an array of benefits across a wide range of energy policy goals. The Commission believes these benefits—in light of the environmental and energy security challenges the United States and the world will confront—justify sustained public and private sector support for RD&D on both existing light-water reactor technology and advanced reactor and fuel-cycle technologies.

The Commission also recommends expanded federal joint labor management and university-based support for advanced science, technology, engineering, and mathematics training. We recommend this to develop the skilled workforce needed to support an effective waste management program, as well as a viable domestic nuclear industry.

Our eighth recommendation is to urge active U.S. leadership in international efforts to address safety, nonproliferation, and security concerns. As more nations consider pursuing nuclear energy or expanding their nuclear programs, U.S. leadership is urgently needed on issues of safety, nonproliferation, and security and counterterrorism. From the U.S. perspective, two points are particularly important. First, with so many players in the international nuclear technology and policy arena, the United States will increasingly have to lead by engagement and by example. Second, the United States cannot exercise effective leadership on issues related to the backend of the nuclear fuel cycle so long as our own program is in disarray. Effective domestic policies are needed to support America's international agenda.

In conclusion, the problem of nuclear waste may be unique in the sense that there is wide agreement about the outlines of the solution. Simply put, we know what we have to do, we know we have to do it, and we even know how to do it. We believe the conditions for progress are arguably more promising than they have been in some time, but we will only know if we start, which is what we urge the Administration and the Congress to do without further delay.

Thank you for having us here today. We ask that you include a full version of our testimony for the record and we look forward to your questions.

[The prepared statement of General Scowcroft and Mr. Meserve follows:]

PREPARED STATEMENT OF LIEUTENANT GENERAL BRENT SCOWCROFT (RET.),
CO-CHAIRMAN, AND THE HONORABLE RICHARD MESERVE, COMMISSIONER,
BLUE RIBBON COMMISSION ON AMERICA'S NUCLEAR FUTURE

**STATEMENT OF
GENERAL BRENT SCOWCROFT, CO-CHAIRMAN
AND
DR. RICHARD MESERVE, COMMISSIONER
BLUE RIBBON COMMISSION
ON AMERICA'S NUCLEAR FUTURE
BEFORE THE
COMMITTEE ON SCIENCE, SPACE AND TECHNOLOGY
U.S. HOUSE OF REPRESENTATIVES
SECOND SESSION, 112TH CONGRESS
FEBRUARY 8, 2012**

Introduction

Chairman Hall, Ranking Member Johnson, members of the Committee, it is a pleasure to appear before you today to discuss the final recommendations of the Blue Ribbon Commission on America's Nuclear Future. We appreciate the leadership this Committee has shown in confronting some of our nation's biggest challenges, which certainly include the focus of this hearing - managing spent nuclear fuel and high level nuclear waste in the United States. Thank you for allowing us the opportunity to testify before you today.

Before we begin, I would like to pass along Co-Chairman Hamilton's deepest regrets for not being here with us today. It's been an absolute pleasure working with him. Both the Congressman and I are thankful that Dr. Richard Meserve could stand in his place today. I would also like to thank the rest of the members of the Commission who worked so hard in creating our final report. Congressman Hamilton and I were delighted to work with such a talented and dedicated group of fellow Commissioners. We are thankful for the expertise and insights they brought to our endeavors. Their professionalism led to our final report having unanimous approval; all of the Commissioners have agreed to our final report, a fact which we believe speaks to the strength of our recommendations.

As you aware, the Blue Ribbon Commission was formed by the Secretary of Energy at the direction of the President. Our charge was to conduct a comprehensive review of policies for managing the back end of the nuclear fuel cycle and to recommend a new strategy. We came away from our review frustrated by decades of unmet commitments to the American people, yet confident that we can turn this record around.

Framing the Issue

Mr. Chairman, as we are all too well aware, America's nuclear waste management program is at an impasse. The Administration's decision to halt work on a repository at Yucca Mountain is but the latest indicator of a policy that has been troubled for decades and has now all but completely broken down. The approach laid out under the 1987 Amendments to the Nuclear Waste Policy Act has simply not worked to produce a timely solution for dealing with the nation's most hazardous radioactive materials. The United States has traveled nearly 25 years down the current path only to come to a point where continuing to rely on the same approach seems destined to bring further controversy, litigation, and protracted delay.

What we have found is that our nation's failure to come to grips with the nuclear waste issue has already proved damaging and costly. It will be even more damaging and more costly the longer it continues: damaging to prospects for maintaining a potentially important energy supply option for the future, damaging to state – federal relations and public confidence in the federal government's competence, and damaging to America's standing in the world as a source of nuclear expertise and as a leader on global issues of nuclear safety, non-proliferation, and security.

This failure is also costly to utility ratepayers who continue to pay for a nuclear waste management solution that has yet to be delivered, to communities that have become unwilling hosts of long-term waste storage facilities, and to U.S. taxpayers who face billions in liabilities as a result of the failure to meet federal waste management commitments. The national interest demands that our nuclear waste program be fixed.

The need for a new strategy is urgent, not just to address these damages and costs, but also because this generation has a fundamental ethical obligation to avoid burdening future generations with finding a safe permanent solution for managing hazardous nuclear materials they had no part in creating. At the same time, we owe it to future generations to avoid foreclosing options wherever possible so that they can make choices—about the use of nuclear energy as a low-carbon energy resource and about the management of the nuclear fuel cycle—based on emerging technologies and developments and their own best interests.

Put simply, the overall record of the U.S. nuclear waste program has been one of broken promises and unmet commitments. And yet the Commission finds reasons for confidence that we can turn this record around. To be sure, decades of failed efforts to develop a repository for spent fuel and high-level waste have produced frustration and a deep erosion of trust in the federal government. But they have also produced important insights, a clearer understanding of the technical and social issues to be resolved, and at least one significant success story – the

WIPP facility in New Mexico. Moreover, many people have looked at aspects of this record and come to similar conclusions.

The Scale of the Problem

Mr. Chairman, before we discuss our recommendations it is useful to briefly review the scale of the nuclear waste problem in the U.S. As this Committee is certainly aware, there are 104 commercial nuclear power reactors operating in the United States today, supplying approximately 20 percent of our nation's electricity needs. The industry as a whole generates more than 2,000 metric tons of spent nuclear fuel on an annual basis. At present, nearly all of the nation's existing inventory of approximately 65,000 metric tons of spent fuel is being stored at the reactor sites where it was generated—about three-quarters of it in shielded concrete pools and the remainder in dry casks above ground. Roughly speaking, this spent fuel would cover one football field to a depth of approximately 20 feet. This inventory also includes approximately 3,000 metric tons of what we've called "stranded" spent fuel, fuel in storage at ten sites where nuclear power reactors have been shut down and are no longer operating.

In addition to the civilian spent nuclear fuel, there is a considerable inventory of DOE-managed nuclear waste – in the form of both spent nuclear fuel and of liquid high level waste. The current inventory of DOE-managed spent fuel represents a relatively small fraction of the nation's total civilian spent-fuel inventory: approximately 2,500 metric tons. Along with spent nuclear fuel, DOE manages an inventory of high level waste totaling more than 3,000 canisters of vitrified wastes and some 90 million gallons of liquids, sludges and solids from past fuel reprocessing operations for weapons production. Most of this waste is being stored at DOE's Hanford, Idaho National Laboratory, and Savannah River sites. In addition, there is a small amount of vitrified high level waste from reprocessing fuel from both commercial power reactors and government reactors at the West Valley site in New York that will also require disposal.

Our Approach

Fulfilling our charter has required the Commission to investigate a wide range of issues and listen to a broad spectrum of concerned stakeholders. It became clear to us early on that many of the problems facing our nuclear waste program have their roots in social distrust and lack of confidence in government, so we strove to make the Commission's work as inclusive, transparent, and accessible as possible. We heard from hundreds of invited witnesses, toured nuclear waste management facilities in the U.S. and abroad, and received thousands of comments at more than two dozen public meetings and through our web site.

The Commission released a draft report for public comment in July of 2011. To facilitate meaningful discussion about our draft report, we arranged for a series of public meetings to be held in cooperation with regional state government groups. These meetings were held in Atlanta, Boston, Denver, Minneapolis, and Washington, DC, and were quite helpful in gaining useful insights that are reflected in our final report.

In total, we received and reviewed several thousand comments on our draft report. We are indebted to the many people who have given us the benefit of their expertise, advice, and guidance. A full list of the Commission's meetings is included in a longer version of this statement that we intend to submit for the record.

Key Elements of the Blue Ribbon Commission's Final Recommendations

Mr. Chairman, the strategy we recommend in our final report has eight key elements:

1. A new, consent-based approach to siting future nuclear waste management facilities.
2. A new organization dedicated solely to implementing the waste management program and empowered with the authority and resources to succeed.
3. Access to the funds nuclear utility ratepayers are providing for the purpose of nuclear waste management.
4. Prompt efforts to develop one or more geologic disposal facilities.
5. Prompt efforts to develop one or more consolidated storage facilities.
6. Prompt efforts to prepare for the eventual large-scale transport of spent nuclear fuel and high-level waste to consolidated storage and disposal facilities when such facilities become available.
7. Support for continued U.S. innovation in nuclear energy technology and for workforce development.
8. Active U.S. leadership in international efforts to address safety, waste management, non-proliferation, and security concerns.

Although the elements of this strategy will not be new to Members and staff of this Committee who have followed the U.S. nuclear waste program over the years, we are certain they are all necessary to establish a truly integrated national nuclear waste management system, to create the institutional leadership and wherewithal to get the job done, and to ensure that the United States remains at the forefront of technology developments and international responses to evolving nuclear safety, non-proliferation, and security concerns.

A few general points about the Commission's proposed strategy are worth emphasizing before our recommendations are discussed in greater detail here today. First is the issue of cost. In this time of acute concern about the federal budget deficit and high energy prices, we have been sensitive to the concern that our recommendations—particularly those that involve launching a new approach and a new organization for nuclear waste management—could add to the financial burden on the U.S. Treasury and on American taxpayers and utility ratepayers. Certainly it will cost something to implement a successful U.S. waste management program; however, trying to implement a deeply flawed program is even more costly, for all the reasons already mentioned. In fact, U.S. ratepayers are *already* paying for waste disposal (through a fee collected on each kilowatt-hour of nuclear-generated electricity)—but the program they're paying for isn't working.

Overall, we are confident that our waste management recommendations can be implemented using revenue streams *already dedicated for this purpose*—in particular the Nuclear Waste Fund and fee. Other Commission recommendations—particularly those concerning nuclear technology programs and international policies—are broadly consistent with the program plans of the relevant agencies.

Another overarching point concerns timing and implementation. All of our recommendations are interconnected and will take time to implement fully, particularly since many elements of the strategy we propose require legislative action to amend the Nuclear Waste Policy Act and other relevant laws. Nevertheless, prompt action can and should be taken in several areas, without waiting for legislative action, to get the waste management program back on track.

One of the many actions we recommend the Administration take in the near-term is to ensure that funds already being collected from nuclear utility ratepayers to cover the costs of spent fuel disposal are available to serve their intended purpose. In our report we suggest a series of actions that can be taken promptly to give the waste program the budgetary certainty that will be essential for long-term success. We also recommend steps the Department of Energy should take to enable implementation of our consolidated storage recommendations, including efforts to provide assistance to states and regional state government groups that can be used to begin transportation planning and to support local and tribal officials in areas likely to be traversed by spent fuel shipments.

Finally, there are several questions the Commission was not chartered to address. We have not rendered an opinion on the suitability of the Yucca Mountain site or any other specific site, nor have we commented on the request to withdraw the license application for Yucca Mountain. Instead, we focused on developing a sound strategy for future storage and disposal facilities and operations that we believe *can and should be implemented regardless of what happens*

with Yucca Mountain. We have also not offered a judgment about the appropriate role of nuclear power in the nation's future energy supply mix.

These are all important questions that will engage policy makers and the public in the years ahead. However, none of them alters the urgent need to change and improve our strategy for managing the high-level wastes and spent fuel that already exist and will continue to accumulate so long as nuclear reactors operate in this country. That is the focus of the Commission's work and of the specific recommendations that follow.

Further Discussion of the BRC's Recommendations

Mr. Chairman, as we mentioned previously, there are eight key elements to our strategy that are essential to the future success of the nuclear waste management program in the United States. We will now discuss those in more detail.

1. A New Consent-Based Approach to Siting

Siting storage or disposal facilities has been the most consistent and most intractable challenge for the U.S. nuclear waste management program. Of course, the first requirement in siting any facility centers on the ability to demonstrate adequate protection of public health and safety and the environment. Beyond this threshold criterion, finding sites where all affected units of government, including the host state or tribe, regional and local authorities, and the host community, are willing to support or at least accept a facility has proved exceptionally difficult. The erosion of trust in the federal government's nuclear waste management program has only made this challenge more difficult. And whenever one or more units of government are opposed, the odds of success drop greatly. The crux of the challenge derives from a federal/state/tribal/local rights dilemma that is far from unique to the nuclear waste issue—no simple formula exists for resolving it. Experience in the United States and in other nations suggests that any attempt to force a top-down, federally mandated solution over the objections of a state or community—far from being more efficient—will take longer, cost more, and have lower odds of ultimate success.

By contrast, the approach we recommend is explicitly adaptive, staged, and consent-based. Based on a review of successful siting processes in the United States and abroad—including most notably the siting of a disposal facility for transuranic radioactive waste, the Waste Isolation Pilot Plant (WIPP) in New Mexico, and recent positive outcomes in Finland, Sweden, Spain and France—we believe this type of approach can provide the flexibility and sustain the public trust and confidence needed to see controversial facilities through to completion.

In practical terms, this means encouraging communities to volunteer to be considered to host a new nuclear waste management facility while also allowing for the waste management

organization to approach communities that it believes can meet the siting requirements. Siting processes for waste management facilities should include a flexible and substantial incentive program.

The approach we recommend also recognizes that successful siting decisions are most likely to result from a complex and perhaps extended set of negotiations between the implementing organization and potentially affected state, tribal, and local governments, and other entities. It would be desirable for these negotiations to result in a partnership agreement or some other form of legally enforceable agreement with the organization to ensure that commitments to and by host states, tribes, and communities are upheld. All affected levels of government must have, at a minimum, a meaningful consultative role in important decisions; additionally, both host states and tribes should retain—or where appropriate, be delegated—direct authority over aspects of regulation, permitting, and operations where oversight below the federal level can be exercised effectively and in a way that is helpful in protecting the interests and gaining the confidence of affected communities and citizens. At the same time, host state, tribal and local governments have responsibilities to work productively with the federal government to help advance the national interest.

In this context, any process that is prescribed in detail up front is unlikely to work. Transparency, flexibility, patience, responsiveness, and a heavy emphasis on consultation and cooperation will all be necessary—indeed, these are attributes that should apply not just to siting but to every aspect of program implementation.

This discussion raises another issue highlighted in numerous comments to the BRC: the question of how to define “consent.” The Commission takes the view that this question ultimately has to be answered by a potential host jurisdiction, using whatever means and timing it sees fit. We believe that a good gauge of consent would be the willingness of the affected units of government – the host states, tribes, and local communities – to enter into legally binding agreements with the facility operator, where these agreements enable states, tribes, or communities to have confidence that they can protect the interests of their citizens.

All siting processes take time; however, an adaptive, staged approach may seem particularly slow and open-ended. This will be frustrating to stakeholders and to members of the public who are understandably anxious to know when they can expect to see results. The Commission shares this frustration—greater certainty and a quicker resolution would have been our preference also. Experience, however, leads us to conclude that there is no short-cut, and that any attempt to short-circuit the process will most likely lead to more delay. That said, we also believe that attention to process must not come at the expense of progress and we are sympathetic to the numerous comments we received asking us to include a more detailed and

specific set of milestones in our final report. Obviously there is an inherent tension between recommending an adaptive, consent-based process and setting out deadlines or progress requirements in advance. But we agree that it will be important—without imposing inflexible deadlines—to set reasonable performance goals and milestones for major phases of program development and implementation so that Congress can hold the waste management organization accountable and so that stakeholders and the public can have confidence the program is moving forward. Other countries have taken this approach, in several cases identifying target timeframes, rather than specific dates for completing stages in their process. For example the implementing organization might consider a range of, say, 15 to 20 years to accomplish site identification and characterization and to conduct the licensing process for a geologic repository. A notional timeframe for siting and developing a consolidated storage facility would presumably be shorter, perhaps on the order of 5 to 10 years.

2. A New Organization to Implement the Waste Management Program

The U.S. Department of Energy (DOE) and its predecessor agencies have had primary responsibility for implementing U.S. nuclear waste policy for more than 50 years. In that time, DOE has achieved some notable successes, as shown by the WIPP experience and recent improvements in waste cleanup performance at several DOE sites. The overall record of DOE and of the federal government as a whole, however, has not inspired widespread confidence or trust in our nation's nuclear waste management program. For this and other reasons, the Commission concludes that a new, single-purpose organization is needed to provide the stability, focus, and credibility needed to get the waste program back on track. We believe a congressionally chartered federal corporation offers the best model, but whatever the specific form of the new organization it must possess the attributes, independence, and resources to effectively carry out its mission.

The central task of the new organization would be to site, license, build, and operate facilities for the safe consolidated storage and final disposal of spent fuel and high-level nuclear waste at a reasonable cost and within a reasonable timeframe. In addition, the new organization would be responsible for arranging for the safe transport of waste and spent fuel to or between storage and disposal facilities, and for undertaking applied research, development, and demonstration (RD&D) activities directly relevant to its waste management mission (e.g., testing the long-term performance of fuel in dry casks and during subsequent transportation).

For the new organization to succeed, a substantial degree of implementing authority and assured access to funds must be paired with rigorous financial, technical, and regulatory oversight by Congress and the appropriate government agencies. We recommend that the organization be directed by a board nominated by the President, confirmed by the Senate, and

selected to represent a range of expertise and perspectives. Independent scientific and technical oversight of the nuclear waste management program is essential and should continue to be provided for out of nuclear waste fee payments. In addition, the presence of clearly independent, competent regulators is essential; we recommend the existing roles of the U.S. Environmental Protection Agency in establishing standards and the Nuclear Regulatory Commission (NRC) in licensing and regulating waste management facilities be preserved but that steps be taken to ensure ongoing cooperation and coordination between these agencies.

Late in our review we heard from several states that host DOE defense waste that they agree with the proposal to establish a new organization to manage civilian wastes, but believe the government can more effectively meet its commitments if responsibility for defense waste disposal remains with DOE. Others argued strongly that the current U.S. policy of commingling defense and civilian wastes should be retained. We are not in a position to comprehensively assess the implications of any actions that might affect DOE's compliance with its cleanup agreements, and we did not have the time or the resources necessary to thoroughly evaluate the many factors that must be considered by the Administration and Congress in making such a determination. The Commission therefore urges the Administration to launch an immediate review of the implications of leaving responsibility for disposal of defense waste and other DOE-owned waste with DOE versus moving it to a new waste management organization. The implementation of other BRC recommendations, however, should not wait for the commingling issue to be resolved. Congressional and Administration efforts to implement our recommendations can and should proceed as expeditiously as possible

3. Access to Utility Waste Disposal Fees for their Intended Purpose

The 1982 NWPA created a "polluter pays" funding mechanism to ensure that the full costs of disposing of commercial spent fuel would be paid by utilities (and their ratepayers), with no impact on taxpayers or the federal budget. Nuclear utilities are assessed a fee on every kilowatt-hour of nuclear-generated electricity as a *quid pro quo* payment in exchange for the federal government's contractual commitment to begin accepting commercial spent fuel beginning by January 31, 1998. Fee revenues go to the government's Nuclear Waste Fund, which was established for the sole purpose of covering the cost of disposing of civilian nuclear waste and ensuring that the waste program would not have to compete with other funding priorities. In contrast, costs for disposing of defense nuclear wastes are paid by taxpayers through appropriations from the Treasury.

The Fund does not work as intended. A series of Executive Branch and Congressional actions has made annual fee revenues (approximately \$750 million per year) and the unspent \$27 billion balance in the Fund effectively inaccessible to the waste program. Instead, the waste

program must compete for federal funding each year and is therefore subject to exactly the budget constraints and uncertainties that the Fund was created to avoid. This situation must be remedied to allow the program to succeed.

In the near term, the Administration should offer to amend DOE's standard contract with nuclear utilities so that utilities remit only the portion of the annual fee that is appropriated for waste management each year and place the rest in a trust account, held by a qualified third-party institution, to be available when needed. At the same time, the Office of Management and Budget should work with the Congressional budget committees and the Congressional Budget Office to change the budgetary treatment of annual fee receipts so that these receipts can directly offset appropriations for the waste program. These actions are urgent because they enable key subsequent actions the Commission recommends. Therefore, we urge the Administration to act promptly to implement these changes (preferably in Fiscal Year 2013). For the longer term, legislation is needed to transfer the unspent balance in the Fund to the new waste management organization so that it can carry out its civilian nuclear waste obligations independent of annual appropriations (but with Congressional oversight)—similar to the budgeting authority now given to the Tennessee Valley Authority and Bonneville Power Administration.

We recognize that these actions mean no longer counting nuclear waste fee receipts against the federal budget deficit and that the result will be a modest negative impact on annual budget calculations. The point here is that the federal government is contractually bound to use these funds to manage spent fuel. The bill will come due at some point. Meanwhile, failure to correct the funding problem does the federal budget no favors in a context where taxpayers remain liable for mounting damages, compensated through the Judgment Fund, for the federal government's continued inability to deliver on its waste management obligations. These liabilities are already in the billions of dollars and could increase by hundreds of millions of dollars annually for each additional year of delay.

4. Prompt Efforts to Develop a New Geologic Disposal Facility

Deep geologic disposal capacity is an essential component of a comprehensive nuclear waste management system for the simple reason that very long-term isolation from the environment is the *only* responsible way to manage nuclear materials with a low probability of re-use, including defense and commercial reprocessing wastes and many forms of spent fuel currently in government hands. The conclusion that disposal is needed and that deep geologic disposal is the scientifically preferred approach has been reached by every expert panel that has looked at the issue and by every other country that is pursuing a nuclear waste management program.

Some commenters have urged the prompt adoption of recycling of spent fuel as a response to the waste disposal challenge, as well as a means to extend fuel supply. *It is the Commission's view that it would be premature for the United States to commit, as a matter of policy, to "closing" the nuclear fuel cycle given the large uncertainties that exist about the merits and commercial viability of different fuel cycles and technology options.* Future evaluations of potential alternative fuel cycles must account for linkages among all elements of the fuel cycle (including waste transportation, storage, and disposal) and for broader safety, security, and non-proliferation concerns. Moreover, all spent fuel reprocessing or recycle options generate waste streams that require a permanent disposal solution. In any event, we believe permanent disposal will very likely also be needed to safely manage at least some portion of the commercial spent fuel inventory even if a closed fuel cycle were adopted.

The Commission recognizes that current law establishes Yucca Mountain in Nevada as the site for the first U.S. repository for spent fuel and high-level waste, provided the license application submitted by DOE meets relevant requirements. The Blue Ribbon Commission was not chartered as a siting commission. Accordingly we have not evaluated Yucca Mountain or any other location as a potential site for the storage or disposal of spent nuclear fuel and high-level waste, nor have we taken a position on the Administration's request to withdraw the license application. We simply note that regardless what happens with Yucca Mountain, the U.S. inventory of spent nuclear fuel will soon exceed the amount that can be legally emplaced at this site until a second repository is in operation. So under current law, the United States will need to find a new disposal site even if Yucca Mountain goes forward. We believe the approach set forth here provides the best strategy for assuring continued progress, regardless of the fate of Yucca Mountain.

5. Prompt Efforts to Develop One or More Consolidated Storage Facilities

Safe and secure storage is another critical element of an integrated and flexible national waste management system. Fortunately, experience shows that storage—either at or away from the sites where the waste was generated—can be implemented safely and cost-effectively. *Indeed, a longer period of time in storage offers a number of benefits because it allows the spent fuel to cool while keeping options for future actions open.*

Developing consolidated storage capacity would allow the federal government to begin the orderly transfer of spent fuel from reactor sites to safe and secure centralized facilities independent of the schedule for operating a permanent repository. The arguments in favor of consolidated storage are strongest for "stranded" spent fuel from shutdown plant sites. Stranded fuel should be first in line for transfer to a consolidated facility so that these plant sites can be completely decommissioned and put to other beneficial uses. Looking beyond the issue of today's

stranded fuel, the availability of consolidated storage will provide valuable flexibility in the nuclear waste management system that could achieve meaningful cost savings for both ratepayers and taxpayers when a significant number of plants are shut down in the future, can provide emergency back-up storage in the event that spent fuel needs to be moved quickly from a reactor site, and would provide an excellent platform for ongoing R&D to better understand how the storage systems currently in use at both commercial and DOE sites perform over time.

For consolidated storage to be of greatest value to the waste management system, the current rigid legislative restriction that prevents a storage facility developed under the NWPA from operating significantly earlier than a repository should be eliminated. At the same time, efforts to develop consolidated storage must not hamper efforts to move forward with the development of disposal capacity. To allay the concerns of states and communities that a consolidated storage facility might become a *de facto* disposal site, a program to establish consolidated storage must be accompanied by a parallel disposal program that is effective, focused, and making discernible progress in the eyes of key stakeholders and the public. Progress on both fronts is needed and must be sought without further delay.

Even with timely development of consolidated storage facilities, a large quantity of spent fuel will remain at reactor sites for many decades before it can be accepted by the federal waste management program. Current at-reactor storage practices and safeguards are being scrutinized in light of the lessons that are emerging from Fukushima. In addition, the Commission recommends that the National Academy of Sciences (NAS) conduct a thorough assessment of lessons learned from Fukushima and their implications for conclusions reached in earlier NAS studies on the safety and security of current storage arrangements for spent nuclear fuel and high-level waste in the United States. This effort would complement investigations already underway by the NRC and other organizations. More broadly, it will also be vital to continue vigorous public and private research and regulatory oversight efforts in areas such as spent fuel and storage system degradation phenomena, vulnerability to sabotage and terrorism, full-scale cask testing, and others. As part of this process, it is appropriate for the NRC to examine the advantages and disadvantages of options such as "hardened" onsite storage that have been proposed to enhance security at storage sites.

6. *Early Preparation for the Eventual Large-Scale Transport of Spent Nuclear Fuel and High-Level Waste to Consolidated Storage and Disposal Facilities*

The current system of standards and regulations governing the transport of spent fuel and other nuclear materials appears to have functioned well, and the safety record for past shipments of these types of materials is excellent. But the current set of transport-related regulations will need to be updated to accommodate changes in fueling practices. Moreover,

past performance does not guarantee that future transport operations will match the record to date, particularly as the logistics involved expand to accommodate a much larger number of shipments. Past experiences in the United States and abroad, and extensive comments to the Commission, indicate that many people fear the transportation of nuclear materials. Thus greater transport demands are likely to raise new public concerns.

As with siting fixed facilities, planning for associated transportation needs has historically drawn intense interest. Transport operations typically also have the potential to affect a far larger number of communities. The Commission believes that state, tribal and local officials should be extensively involved in transportation planning and should be given the resources necessary to discharge their roles and obligations in this arena. Accordingly, DOE should (1) finalize procedures and regulations for providing technical assistance and funds for training to local governments and tribes pursuant to Section 180(c) of the NWPA and (2) begin to provide such funding, independent from progress on facility siting. While it would be premature to fully fund a technical assistance program before knowing with some certainty where the destination sites for spent fuel are going to be, substantial benefits can be gained from a modest early investment in planning for the early transport of spent fuel from shutdown reactor sites.

Planning and providing for adequate transportation capacity while simultaneously addressing related stakeholder concerns will take time and present logistical and technical challenges. Given that transportation represents a crucial link in the overall storage and disposal system, it will be important to allow substantial lead-time to assess and resolve transportation issues well in advance of when materials would be expected to actually begin shipping to a new facility. For many years, states have been working cooperatively with DOE to plan for shipments, often through agreements with regional groupings of states and in ways that involve radiological health, law enforcement, and emergency response personnel. As has been shown with the WIPP program and other significant waste shipping campaigns, planning, training and execution involves many different parties and takes time. In addition, specialized equipment may be required that will need to be designed, fabricated and tested before being placed into service. Historically, some programs have treated transportation planning as an afterthought. No successful programs have done so.

7. Support for Advances in Nuclear Energy Technology and for Workforce Development

Advances in nuclear energy technology have the potential to deliver an array of benefits across a wide range of energy policy goals. The Commission believes these benefits—in light of the environmental and energy security challenges the United States and the world will confront this century—justify sustained public- and private-sector support for RD&D on a range of reactor and fuel cycle technologies. The invitation for us to testify before this committee asked that

our testimony identify nuclear energy research and development technology priorities and the potential impact of new technology on nuclear waste management policy.

We believe a well-designed federal RD&D program is critical to enabling the U.S. to regain its role as the global leader of nuclear technology innovation and should be attentive to opportunities in two distinct realms:

1. Near-term improvements in the safety and performance of existing light-water reactor technology as currently deployed in the United States and elsewhere as part of a once-through fuel cycle, and in the technologies for storing and disposing of SNF and HLW.
2. Longer-term efforts to advance potential “game changing” nuclear technologies and systems that could achieve very large benefits across multiple evaluation criteria compared to current technologies and systems. Examples might include fast-spectrum reactors demonstrating passive safety characteristics that are capable of continuous actinide recycling and that use uranium more efficiently, or reactors that—by using molten salt or gas coolants—achieve very high temperatures and can thereby supply process heat for hydrogen production or other purposes, or small modular reactors with novel designs for improved safety characteristics and the potential to change the capital cost and financing structure for new reactors.

The Commission believes the general direction of the current DOE research and development (R&D) program is appropriate, although we also urge DOE to take advantage of the Quadrennial Energy Review process to refine its nuclear R&D “roadmap.” We are not making a specific recommendation concerning future DOE funding for nuclear energy RD&D; in light of the extraordinary fiscal pressures the federal government will confront in coming years, we believe that budget decisions must be made in the context of a broader discussion about priorities and funding for energy RD&D more generally.

One area where the Commission recommends increased effort involves ongoing work by the NRC to develop a regulatory framework for advanced nuclear energy systems. Such a framework can help guide the design of new systems and lower barriers to commercial investment by increasing confidence that new systems can be successfully licensed. Specifically, the Commission recommends that adequate federal funding be provided to the NRC to support a robust effort in this area. We also support the NRC’s risk-informed, performance-based approach to developing regulations for advanced nuclear energy systems, including NRC’s ongoing review of the current waste classification system (changes to the existing system may eventually require a change in law).

Another area where further investment is needed is nuclear workforce development. Specifically, the Commission recommends expanded federal, joint labor-management and university-based support for advanced science, technology, engineering, and mathematics training to develop the skilled workforce needed to support an effective waste management program as well as a viable domestic nuclear industry. At the same time, DOE and the nuclear energy industry should work to ensure that valuable existing capabilities and assets, including critical infrastructure and human expertise, are maintained. Finally, the jurisdictions of safety and health agencies should be clarified and aligned. New site-independent safety standards should be developed by the safety and health agencies responsible for protecting nuclear workers through a coordinated joint process that actively engages and solicits input from all relevant constituencies. Efforts to support uniform levels of safety and health in the nuclear industry should be undertaken with federal, industry, and joint labor–management leadership. Safety and health practices in the nuclear construction industry should provide a model for other activities in the nuclear industry.

8. Active U.S. Leadership in International Efforts to Address Safety, Non-Proliferation and Security Concerns

As more nations consider pursuing nuclear energy or expanding their nuclear programs, U.S. leadership is urgently needed on issues of safety, non-proliferation, and security/counterterrorism. Many countries, especially those just embarking on commercial nuclear power development, have relatively small programs and may lack the regulatory and oversight resources available to countries with more established programs. International assistance may be required to ensure they do not create disproportionate safety, physical security, and proliferation risks. In many cases, mitigating these risks will depend less on technological interventions than on the ability to strengthen international institutions and safeguards while promoting multilateral cooperation and coordination. From the U.S. perspective, two further points are particularly important: First, with so many players in the international nuclear technology and policy arena, the United States will increasingly have to lead by engagement and by example. Second, the United States cannot exercise effective leadership on issues related to the back end of the nuclear fuel cycle so long as its own program is in disarray; effective domestic policies are needed to support America’s international agenda.

The Fukushima accident has focused new attention on nuclear safety worldwide. Globally, some 60 new reactors are under construction and more than 60 countries that do not have nuclear power plants have expressed interest in acquiring them. These nations will have to operate their facilities safely and plan for safe storage and disposition of spent nuclear fuel. The United States should help launch a concerted international safety initiative—encompassing

organizations like the International Atomic Energy Agency (IAEA) as well as regulators, vendors, operators, and technical support organizations—to assure the safe use of nuclear energy and the safe management of nuclear waste in all countries that pursue nuclear technology.

Nuclear weapons proliferation has been a central concern of U.S. nuclear policy from the earliest days of the nuclear era. These concerns are still prominent, especially where the deployment of uranium enrichment, reprocessing, and recycled fuel fabrication technology is being contemplated. As countries with relatively less nuclear experience acquire nuclear energy systems, the United States should work with the IAEA, nuclear power states, private industry, and others in the international community to ensure that all spent fuel remains under effective and transparent control and does not become “orphaned” anywhere in the world with inadequate safeguards and security.

Longer term, the United States should support the use of multi-national fuel-cycle facilities, under comprehensive IAEA safeguards, as a way to give more countries reliable access to the benefits of nuclear power while simultaneously reducing proliferation risks. U.S. sponsorship of the recently-created IAEA global nuclear fuel bank is an important step toward establishing such access while reducing a driver for some states to engage in uranium enrichment. But more is needed. The U.S. government should propose that the IAEA lead a new initiative, with active U.S. participation, to explore the creation of one or more multi-national spent fuel storage or disposal facilities.

In addition, the United States should support the evolution of spent fuel “take-away” arrangements as a way to allow some countries, particularly those with relatively small national programs, to avoid the costly and politically difficult step of providing for spent fuel disposal on their soil and to reduce associated safety and security risks. An existing program to accept highly-enriched uranium fuel from research reactors abroad for storage in the United States has provided a demonstration—albeit a limited one—of the national security value of such arrangements. The capability to accept limited quantities of spent fuel from foreign commercial reactors could be similarly valuable from a national security perspective. As the United States moves forward with developing its own consolidated storage and disposal capacity, it should work with the IAEA and with existing and emerging nuclear nations to establish conditions under which one or more nations, including the United States, can offer to take foreign spent fuel for ultimate disposition.

The susceptibility of nuclear materials or facilities to intentional acts of theft or sabotage for terrorist purposes is a relatively newer concern but one that has received considerable attention since 9/11. The United States should continue to work with countries of the former Soviet Union and other nations through initiatives such as the Nunn-Lugar Cooperative Threat

Reduction Program and the Global Initiative to Combat Nuclear Terrorism to prevent, detect, and respond to nuclear terrorism threats. Domestically, evolving terrorism threats and security risks must be closely monitored by the NRC, the Department of Homeland Security, and other responsible agencies to ensure that any additional security measures needed to counter those threats are identified and promptly implemented. The recent events at Fukushima have – as they should – prompted the NRC and the industry to re-examine the adequacy of “mitigative strategies” for coping with large-scale events (like an explosion or fire) or catastrophic system failures (like a sudden loss of power or cooling); as noted previously, we also recommend that Congress charter the National Academy of Sciences to assess lessons learned from Fukushima with respect to the storage of spent fuel.

Tying It Together

In conclusion, the problem of nuclear waste may be unique in the sense that there is wide agreement about the outlines of the solution. Simply put, we know what we have to do, we know we have to do it, and we even know how to do it. Experience in the United States and abroad has shown that suitable sites for deep geologic repositories for nuclear waste can be identified and developed. The knowledge and experience we need are in hand and the necessary funds have been and are being collected. Rather the core difficulty remains what it has always been: finding a way to site these inherently controversial facilities and to conduct the waste management program in a manner that allows all stakeholders, but most especially host communities, states, and tribes, to conclude that their interests have been adequately protected and their well-being enhanced—not merely sacrificed or overridden by the interests of the country as a whole.

This is by no means a small difficulty, but we have witnessed other countries make significant progress with a flexible approach to siting that puts a high degree of emphasis on transparency, accountability, and meaningful consultation. Indeed, our friends in Spain have just succeeded in selecting a site for a consolidated storage facility by using the kind of consent-based process we recommend. Here at home, we have had more than a decade of successful operation of WIPP. And most recently, the Fukushima accident in Japan has reminded Americans that we have little physical capacity at present to do anything with spent nuclear fuel other than to leave it where it is. Against this backdrop, the conditions for progress are arguably more promising than they have been in some time. But we will only know if we start, which is what we urge the Administration and Congress to do, without further delay.

Thank you for having us here today, and we look forward to your questions.

Blue Ribbon Commission on America's Nuclear Future – Commissioners, Commission Staff,***Commissioners***

Lee H. Hamilton, Co-Chair - Director of The Center on Congress at Indiana University; former Member, U.S. House of Representatives (D-IN).

Brent Scowcroft, Co-Chair - President of the Scowcroft Group; former National Security Advisor to Presidents Gerald Ford and George H.W. Bush.

Mark H. Ayers, President, Building and Construction Trades Department, AFL-CIO.

Vicky A. Bailey, Former Commissioner, Federal Energy Regulatory Commission; former Indiana PUC Commissioner; former DOE Assistant Secretary for Policy and International Affairs.

Albert Carnesale, Chancellor Emeritus and Professor, University of California, Los Angeles.

Pete V. Domenici, Senior Fellow, Bipartisan Policy Center; former U.S. Senator (R-NM).

Susan Eisenhower, President, Eisenhower Group, Inc.

Chuck Hagel, Distinguished Professor at Georgetown University and the University of Nebraska at Omaha; former U.S. Senator (R-NE).

Jonathan Lash, President, Hampshire College; former President, World Resources Institute.

Allison M. Macfarlane, Associate Professor of Environmental Science and Policy, George Mason University.

Richard A. Meserve, President, Carnegie Institution for Science and Senior Counsel, Covington & Burling LLP; former Chairman, U.S. Nuclear Regulatory Commission.

Ernest J. Moniz, Professor of Physics and Cecil & Ida Green Distinguished Professor, Massachusetts Institute of Technology.

Per Peterson, Professor and Chair, Dept. of Nuclear Engineering, Univ. of California – Berkeley.

John Rowe, Chairman and Chief Executive Officer, Exelon Corporation.

Phil Sharp, President, Resources for the Future; former Member, U.S. House of Representatives (D-IN).

BRC Staff

John Kotek – *Staff Director*

Matthew Milazzo – *Deputy Director, Staff Liaison to the Reactor and Fuel Cycle Technology Subcommittee*

Tom Isaacs – *Lead Advisor*

Alex Thrower – *Counsel, Staff Liaison to the Transportation and Storage Subcommittee*

Natalia Saraeva – Research Associate, Staff Liaison to the Disposal Subcommittee

Marika Tatsutani – Lead Writer and Editor

Mary Woollen – Government and Community Liaison

Irie Harris – Office Manager

BRC Senior Consultants

Dr. Tom Cotton – Senior Technical Advisor

Allen Croff – Senior Technical Advisor

Dr. Glenn Paulson – Senior Technical Advisor

Blue Ribbon Commission on America's Nuclear Future – Full Commission, Subcommittee, and Regional Meetings

March 25 & 26, 2010 – Washington DC – Full Commission Meeting
May 25 & 26, 2010 – Washington, DC – Full Commission Meeting
July 7, 2010 – Washington, DC – Disposal Subcommittee Meeting
July 12 & 13, 2010 – Idaho Falls, ID – Reactor & Fuel Cycle Technologies Subcommittee Meeting
July 14 & 15, 2010 – Hanford Site/Kennewick, WA – Full Commission Meeting
August 10, 2010 – Maine Yankee Site/Wiscasset, ME – Transportation & Storage Subcommittee Meeting
August 19, 2010 – Washington, DC – Transportation & Storage Subcommittee Meeting
August 30 & 31, 2010 – Washington, DC – Reactor & Fuel Cycle Technologies Subcommittee Meeting
September 1, 2010 – Washington, DC – Disposal Subcommittee Meeting
September 21 & 22, 2010 – Washington, DC – Full Commission Meeting
September 23, 2010 – Washington, DC – Transportation & Storage Subcommittee Meeting
October 12, 2010 – Washington, DC – Reactor & Fuel Cycle Technologies Subcommittee Meeting
October 21 & 22, 2010 – Finland – Disposal Subcommittee Site Visits and Meetings
October 23-26 – Sweden – Disposal Subcommittee Site Visits and Meetings
November 2, 2010 – Chicago, IL – Transportation & Storage Subcommittee Meeting
November 4, 2010 – Washington, DC – Disposal Subcommittee Meeting
November 15 & 16, 2010 – Washington, DC – Full Commission Meeting
January 6 & 7, 2011 – Aiken, SC and Augusta, GA – Savannah River Site Visit and Meeting
January 26, 27 & 28, 2011 – Carlsbad and Albuquerque, NM – Waste Isolation Pilot Plant Site Visit and Meetings
February 1 & 2, 2011 – Washington, DC – Full Commission Meeting
February 3, 2011 – Washington, DC – Classified (Closed) Meeting
February 8-11, 2011 – Japan – Site Visits and Meetings
February 17 & 18, 2011 – Russia – Meetings
February 20, 21 & 22, 2011 – France – Site Visits and Meetings
May 13, 2011 – Washington, DC – Full Commission Meeting
June 21-28, 2011 – United Kingdom and France – Site Visits and Meetings
September 12, 2011 – Denver, CO – Regional Public Meeting
October 12, 2012 – Boston, MA – Regional Public Meeting
October 18, 2011 – Atlanta, GA – Regional Public Meeting
October 20, 2011 – Washington, DC – Regional Public Meeting
October 28, 2011 – Minneapolis, MN – Regional Public Meeting
December 2, 2011 – Washington, DC – Full Commission Meeting

Chairman HALL. I thank you, sir, to both of you.

And I now recognize Dr. Pete Lyons for five minutes to—or whatever it takes to present your testimony, sir.

STATEMENT OF THE HONORABLE PETE LYONS, ASSISTANT SECRETARY OF NUCLEAR ENERGY, DEPARTMENT OF ENERGY

Mr. LYONS. Thank you. Chairman Hall, Ranking Member Johnson, and Members of the Committee, thank you for the opportunity to discuss the Blue Ribbon Commission's Report to the Secretary of Energy. The Administration commends the Commission for its work over the past two years. Their report will inform the Administration's work with Congress to define a responsible and achievable path forward to manage our Nation's used nuclear fuel and nuclear waste.

The President, Secretary Chu, many Members of Congress have spoken out on the importance of nuclear power to our Nation's clean energy future. New nuclear power options with dramatic safety improvements are poised for deployment. Late last year, the passively safe Westinghouse AP1000 reactor received design certification from the Nuclear Regulatory Commission and the BRC, the Commission, endorsed the cost-shared NP 2010 program that had supported this design certification. The NRC vote on the first AP1000 construction and operating license is scheduled for tomorrow, and if approved, it will be our first license for new reactor construction in over three decades, creating thousands of new jobs. And with the support of Congress, we have started the cost-shared program to accelerate commercialization of small modular reactors, which may offer immense national benefits.

But the United States must develop a sustainable used fuel management strategy to ensure that nuclear power continues to be utilized as a safe, reliable resource for our Nation's long-term energy supply and security. In this context, Secretary Chu stated that the Commission's report "is a critical step toward finding a sustainable approach to disposing used nuclear fuel and nuclear waste." The Commission's report highlights our Nation's own success story, the Department's Waste Isolation Pilot Plant, or WIPP. The WIPP experience has shown that a consent-based approach and a superb safety record can lead to the successful development and operation of a geologic repository for nuclear waste disposal that is very well supported by the state and local community.

I have been a close observer of both the Yucca Mountain and WIPP programs. Through growing up in Nevada, working for years at the Nevada test site, directing programs at Los Alamos National Lab for both Yucca Mountain and WIPP, living in New Mexico, and working on Senate staff for eight years, I have seen the stark difference in success between a largely consent-based and a non-consent-based program. Many near-term directions advocated by the Commission align very well with our ongoing programs. Starting in fiscal year 2011, we established the Used Nuclear Fuel Disposition Program to conduct R&D on storage, transportation, and disposal, and I was very pleased that the Commission positively assessed this program. In fiscal year 2012, this program will revisit the recommendations of the 2006 National Academy Report on Transportation Issues and will prepare a report on that work.

We will finalize policy and procedures for providing technical assistance and funds for training public safety officials. We will build upon previous DOE and industrial efforts to initiate the evaluation of designs for consolidated storage, and we will develop communication packages for use with potential host communities. We will also continue R&D to better understand potential degradation mechanisms involved in long-term storage through a university lab consortium led by Texas A&M. And we will continue research on geologic media through partnerships that gain overseas expertise in granite and clay, expand our own studies on salt, and initiate planning for deep borehole studies.

The fiscal year 2012 appropriations report requested that the Department develop a strategy within six months. Interactions within the Administration and with Congress and stakeholders will be a part of this process. We thank the Commission for important contributions towards development of that strategy.

I look forward to your questions and thank you, sir.

[The prepared statement of Mr. Lyons follows:]

PREPARED STATEMENT OF THE HONORABLE PETE LYONS, ASSISTANT SECRETARY OF
NUCLEAR ENERGY, DEPARTMENT OF ENERGY

**Statement of Peter Lyons
Assistant Secretary for Nuclear Energy
U.S. Department of Energy
Before the
Committee on Science, Space, and Technology
U.S. House of Representatives**

**Assessing America's Nuclear Future-
A review of the Blue Ribbon Commission's Report to the Secretary of Energy
February 8, 2012**

Chairman Hall, Ranking Member Johnson, and Members of the Committee, thank you for the opportunity to appear before you today to discuss the Blue Ribbon Commission's (BRC) Report to the Secretary of Energy. The Commissioners worked collaboratively and constructively – through a public, open and transparent process – on recommendations to support a new strategy for the back end of the nuclear fuel cycle. The Administration commends the Commission for its work over the past two years. The Commission's report will inform the Administration's work with Congress to define a responsible and achievable path forward to manage our nation's used nuclear fuel and nuclear waste.

As the President emphasized in his State of the Union Address, "this country needs an all-out, all-of-the-above strategy that develops every available source of American energy." Nuclear energy currently supplies over 70 percent of our nation's carbon-free electricity and will continue to play an integral role in our nation's energy mix. Late last year, the Westinghouse AP1000 reactor received design certification from the Nuclear Regulatory Commission (NRC). The first Combined Construction and Operating License applications are currently under review by the NRC. When the first application is approved, it will be the first license for new domestic reactor construction in over three decades, creating thousands of new nuclear energy jobs. With the support of Congress, the Department has also taken the first step to accelerate the commercialization of Small Modular Reactors (SMRs), which, if domestically manufactured, may improve our competitive edge. On January 20th, the Office of Nuclear Energy released a draft Funding Opportunity Announcement, soliciting input from industry to establish cost-shared agreements for first-of-a-kind engineering to support design certification and licensing of SMRs.

The United States must develop a sustainable fuel cycle and used fuel management strategy to ensure that nuclear power continues to be a safe, reliable resource for our nation's long-term energy supply and security. In this context, Secretary Chu has stated that the BRC's report "is a critical step toward finding a sustainable approach to disposing used nuclear fuel and nuclear waste." The Commission's report highlights our nation's own success story, the Waste Isolation Pilot Plant (WIPP) in New Mexico. The WIPP experience has shown that a consent-based approach and a superb safety record can lead to the successful development and operation of a

geologic repository for nuclear waste disposal that is fully supported by the local community. As part of the Administration's commitment to restarting the nuclear industry in America, we will work with Congress and stakeholders to pursue better, consent-based alternatives for the disposition of used nuclear materials and wastes.

As a beginning, the near-term direction advocated by the BRC aligns with the Office of Nuclear Energy's ongoing programming and planning. In 2010, the Office of Nuclear Energy established the Used Nuclear Fuel Disposition Program (UFD) to conduct scientific research and technology development to enable storage, transportation, and disposal of used nuclear fuel and all radioactive wastes generated by existing and future nuclear fuel cycles. I was very pleased that the BRC assessed the Used Fuel Disposition Campaign in their final report. The Commission recommended that the office continue R&D on transportation, storage, and disposal options for used nuclear fuel as well as support for "other non-site-specific activities" and that it coordinate with states and stakeholders on transportation planning.

FY 2012 Activities on Transportation

In FY 2012, the UFD program will be revisiting the recommendations of the 2006 National Academy report on transportation of used fuel and high level radioactive waste and will prepare a report on an approach to address these recommendations, including re-engaging the regional transportation groups to understand stakeholder issues. Pursuant to section 180 (c) of the Nuclear Waste Policy Act, the program will finalize the policy and procedures for providing technical assistance and funds to States for training local and tribal public safety officials through whose jurisdictions the Department of Energy plans to transport used nuclear fuel or high-level waste.

FY 2012 Activities on Storage

In FY 2012, the UFD program will begin laying the groundwork for evaluating consolidated storage. We will build upon previous DOE work and industry storage licensing efforts to initiate the evaluation of design concepts for consolidated storage and will develop communication packages for use in interactions with potential host communities, describing various attributes of consolidated storage. The program will also continue to conduct R&D to better understand potential degradation mechanisms involved in long-term dry cask storage. Through our Nuclear Energy University Program, we are enlisting the help of university communities to further our R&D on extended dry storage. The Department has awarded \$4.5 million for the Fuel Aging in Storage and Transportation (FAST) Integrated Research Project. The project is being led by Texas A&M University in collaboration with researchers at five other universities and two national laboratories.

FY 2012 Activities on Disposal

In FY 2012, the UFD program will continue conducting R&D on generic geological media. The lessons learned in this country and internationally in evaluating the performance of repositories in various geologic environments are valuable; however, we need a more advanced understanding of various disposal concepts in various media. Through the UFD Campaign, the Department will initiate workshops to determine the best approaches for understanding the behavior of salt in response to heat producing radioactive waste; work with industry to initiate the development of an RD&D plan and roadmap for the borehole disposal concept; and expand work with our international partners on disposal in granite and clay.

The conference report accompanying the fiscal year 2012 appropriations bill directed DOE to develop a strategy for the management of spent nuclear fuel and other nuclear waste within six months of the publication of the Commission's final report. The efforts I have described are an important part of our ongoing work, and the Administration looks forward to evaluating the Commission's recommendations and proposing a broad strategy.

The Administration is committed to collaborating with Congress and stakeholders to find a safe and long-term solution to managing our nation's used nuclear fuel, and we commend the Commission on the important contribution it has made in achieving that goal.

Chairman HALL. And I thank you. I will begin with the questions at this time.

The Blue Ribbon Commission Report really highlights—and then first, let me ask you all to thank Lee Hamilton. He is a man that I have had great regard for, enjoyed a long friendship, benefited from his advice and we would like very much to have had him here.

I think we all agree that transparency is better and that is why I am concerned with the Chairman of the NRC has blocked the NRC staff from completing the scientific and technical review of Yucca Mountain's site suitability. General and Dr. Meserve, regardless of whether Yucca Mountain has a future—and I know you were prevented from considering that or spending very much time on that—I have always lived with the idea if I ignore the impossible and try to cooperate and improve the inevitable, that is kind of the position I feel like you all were put in. You have accepted as the leaders that you have always been and we are trying to receive something from the benefit of the study of important people like each of you.

But to General and Chairman, whether Yucca Mountain has a future or not, don't you really believe that the safety review ought to be made public? Is there any reason why we don't do that?

General SCOWCROFT. Well, Mr. Chairman, we didn't really focus on that part of it.

Chairman HALL. Because you were told not to deal with Yucca?

General SCOWCROFT. We are not a siting commission and we were told not to.

Chairman HALL. Okay.

General SCOWCROFT. But what I would just say is that our recommendations accept Yucca Mountain can continue as a part of a new process. We don't rule one way or another on Yucca Mountain of what should happen to it. And there is a need for more than one repository now anyway because the spent fuel buildup is such that it is close to the capacity of Yucca Mountain now. So we would need additional repositories in any case.

Chairman HALL. Well, in any case, though, I don't see any reason to suppress the safety review and the information from the safety review.

I will ask Dr. Lyons. President Obama is committed to making this Administration the most open and transparent in history. Is there any reason why this information should be withheld from the public and what might the contingent suppression of this technical information mean with respect to the scientific integrity goals, and guidelines that the President regularly touts that he has?

Mr. LYONS. Well, Chairman Hall, I start with the point that details of the NRC's future course with regard to NRC are in litigation now and I think it is appropriate that we wait and understand what the legal opinions are going to be on that. But I would add that as a scientist, my goal is in finding a way forward on a path for used fuel in this country, and I believe that the Blue Ribbon Commission outlines a coherent overall path that, if followed, will lead to success.

Chairman HALL. Would the release of the report have any value at all?

Mr. LYONS. If that is directed at me, sir, since I don't know what is in the report, I really can't comment in detail.

Chairman HALL. Okay. The Blue Ribbon Commission recommendations are centered around the assumption that with an adequate amount of incentives, a "consent-based siting process is going to entice localities and states to serve as a host." What happens if there is simply no locality that agrees to host a repository or if the locality agrees and then changes its mind a couple of years later? And is that the process we have gone through for the past 30 years? Anybody that wants to answer it, it is—I would take an answer from—

General SCOWCROFT. We recommend, as you point out, Mr. Chairman, a consent-based process. There is nothing magic about it and so we can't say that it will produce the right results, but our review of especially the WIPP facility in New Mexico, which has turned out to be a great success with enthusiasm for additional responsibilities in that regard and the recent process in Finland, in Sweden, and in Spain give us the hope that it would work here. Now, our system is even more complicated than most of those in that the federal, state, and local setup is uniquely hard to compromise, but we take great heart from those examples.

Chairman HALL. I just—my time—I have 28 seconds that I have used that I am not entitled to. I am going to stay with the five minutes. But I am just wondering if we are going to be forced to come back here 30 years from now and start all over again. That is the thing that bothers me. And please don't be alarmed by the absence of all these chairs here on both sides because we are at a crucial time in Congress now and they have other things to meet and I think it is a shame that they don't get the benefit of seeing very valuable Americans as you three when you come here to give your testimony. But we do have your written testimony. It will be in the record. It will be there forever and ever and they can avail themselves of that.

I yield back my time and I recognize Mrs. Johnson for her five minutes or 10 minutes or whatever she wants to take.

Ms. JOHNSON. Thank you very much, Mr. Chairman.

As I have listened to the testimony, it appears that whatever happened with Yucca Mountain, the capacity is just about filled. This is my 20th year here and every year that I have been here, there has been a big controversy over Yucca Mountain until the last year or so. And so that within itself has done something to quiet the people near Yucca Mountain. So I think that because we are such a technological society now, it is going to take involvement of stakeholders wherever it is going to be placed. And I think that is what you are recommending. It is not top-down but bottom-up.

Now, I live—my district has one, two, three—five interstates crossing it: 30, 35, 45, 20, and 635. The whole time this kept coming up in Congress, I got all kinds of questions about what move it was going to take, what it was going to do to the community. We probably did not do enough public information. And so whatever happens to Yucca Mountain, we have got to go forward. It is clear that we need to establish some repositories. And so I am pleased that your study does indicate that.

And you have also indicated I think that it is New Mexico that has—where people really kind of came together and were pleased that they were chosen. Was the difference that the people were involved in making the decision or at least kept informed the whole time the decision was being made?

General SCOWCROFT. It is my understanding that that was the case. I hasten to say, though, it still took 20 years for the WIPP thing to work out. But in a process—an iterative process back and forth, which is what we recommend again—the local communities, the state officials, and so on and the Federal Government came to a conclusion which has worked remarkably well.

Ms. JOHNSON. Thank you very much.

Dr. Lyons, what do you see as one of the—what do you think about these major eight recommendations and has the Department looked at them or attempted to educate or implement at all?

Mr. LYONS. We are just initiating a process within the Administration to evaluate those eight recommendations. In addition, the appropriations for fiscal year 2012, the report language, requires a report back to Congress on the Administration's strategy. As that is developed over the next 6 months, there certainly needs to be extensive discussion within the Administration but also involving Congress and other stakeholders because many of the recommendations from the Commission are going to require Congressional action. So it is going to have to be a coordinated effort over the next 6 months looking at this excellent set of recommendations to see exactly how selective ones of them can be translated into policy.

Ms. JOHNSON. Thank you. Now, on this revenue, this 27 billion in the fund is not accessible. What is the problem there?

Mr. LYONS. Well, as the Commission outlines, there have been a number of changes in how that fund is treated in Congress and that fund is now subject to annual appropriations. The Commissioners may want to go into more detail but that is discussed in detail in the report.

Ms. JOHNSON. Thank you. Did you want—maybe I should just go back and read the report in detail, but if you would like to comment, I would appreciate it.

Mr. MESERVE. Well, Mr.—Assistant Secretary Lyons has outlined the situation accurately. There is accumulated total that is in the waste fund of about \$27 billion now, but it is effectively inaccessible in that in order—the way the accounting is done this money comes in every year, it is offset against the deficit, and then money to go out to be spent has to be appropriated in each year to DOE. And so you have a problem that the money, that corpus, which has now grown very large is just not available except through a burdensome appropriation process. And the appropriations have been less than the opprobrium has felt has needed over the years I should add.

We do have some recommendations both short-term and long-term as to how to address that question and that we proposed, for example, in the short-term that the money submit to the Treasury those amounts that would be—then be appropriated for use against the funds is something that in fact the Congress does with the NRC budget. And of course in the long term as this new entity be

formed would be created, the funds should be made immediately available to them for their use.

Ms. JOHNSON. Thank you very much. My time has expired.

Chairman HALL. All right. We will alternate between the majority and the minority, and being fair, I will start with the majority. Ms. Biggert, I recognize you for five minutes.

Mrs. BIGGERT. Thank you, Mr. Chairman, and thank you for holding this important hearing today.

Fourteen years ago when I came to Congress, my first month here I received a notice that President Clinton had shut down—or taken \$20 million out of what was then the reprocessing cycle and that was before I could even pronounce metallurgical and I had to get that money back, which I did. Now, the recycling program was shut down, President Carter, and we have been so far behind other countries now in what we are doing, and I am really disappointed with the way that the recycling was treated in the final report. And I would quote, “We do not believe that today’s recycling technologies or new technology developments in the next three to four decades will change the underlying need for an integrated strategy that combines safe storage of SNF with expeditious progress toward siting and licensing and disposal facility or facilities.”

My concern is that we have wasted so much time with really developing the recycling when talking about the sites, for example, Yucca Mountain, that would be filled with the nuclear waste that we have now. What a waste that is to allow—we put the cart before the horse. Why don’t we have the development of the recycling so that we don’t have as much waste? We don’t—the sites can be different. And instead, we want to just put it in—there is so much—and it is fuel still wasted by putting it into a permanent repository.

And Dr. Lyons, could you tell me if you agree with this time estimate in the final report, the three, four decades that we are going to wait? And we have to develop the fast reactor and we put that aside really to have the recycling at its best. I was just—I went to Morris, Illinois, where there is a nuclear plant. Across the street is a reprocessing plant that was shut down in the ’70s and it sits there. It is like a time warp. You go in—and of course they have removed most of the equipment there, but here it is, just this building with these—and it is used completely for storage, which is now filled. It has been filled since the ’80s and it sits there. Sorry, I am getting off here, but could you talk to the decades that won’t make any difference with the recycling and the underlying need?

Mr. LYONS. I thank you for the question. We do have an extensive fuel cycle program that is looking at a wide range of options. It is looking at everything from the once-through cycle to the closed cycle that you describe. As we evaluate the different fuel cycles, we are considering many different parameters that need to go into such an evaluation. The facility you mentioned in Morris used technologies that I doubt would be found acceptable today from an environmental standpoint, from a nonproliferation standpoint, quite probably from a cost standpoint. But the national laboratories, including Argonne very heavily, are directly involved in the fuel cycle program as we work towards exploring alternatives and understanding what those may be.

I think a key point which the Commission makes and it is certainly an important point in my program is that we can use dry cask storage to buy time to make the decision whether used fuel should be treated as you suggested as a resource or should be treated as a waste. Those are all elements of our program. It is time consuming but it is a logically developed program leading to solutions that we will eventually be bringing to Congress for decisions.

Mrs. BIGGERT. And that timeline could be three, four decades?

Mr. LYONS. It could be at least two or three decades as we evaluate different technologies, go through pilot studies. Yes, it could be that long. This would be an extremely important decision.

Mrs. BIGGERT. And General Scowcroft, could you elaborate on your position on this?

General SCOWCROFT. Yes, I would be happy to. There are two aspects to it. First of all, we enthusiastically support research and development both in reactor design and in recycling and reprocessing aspects. What we say is that at the current time, there is no recycling or reprocessing system which will eliminate the need for waste—to deal with waste. None of them do away with waste. They change the character of it in a variety of ways. But that was what—our focus is not we don't want to do recycling or anything. We agree that we should look for better ways to utilize fuel. We use maybe one percent of the energy value of the fuel we put in our reactor. That is a waste. But what we are saying now, nothing that exists at the present time will solve the problem of waste. All of them still create waste.

Mrs. BIGGERT. Thank you. I yield back.

Chairman HALL. The gentlelady yields back.

I recognize the gentleman from California, Mr. McNerney, for five minutes.

Mr. MCNERNEY. Thank you, Mr. Chairman.

I want to thank the witnesses for your service. This is a bit of a thankless task and it is important, so I am glad that you are all out there working on this.

Mr. Lyons, do you have a favorite—and I know this is simplified; it depends on the nuclear reaction technology. But do you have a favorite nuclear storage disposal technology that you prefer?

Mr. LYONS. As I indicated, sir, in my mind the dry cask storage gives us the opportunity to do additional research to reach the conclusion that you are asking me for. I think it is premature at this point to give you that answer.

Mr. MCNERNEY. Okay, thank you. Well I am going to sort of rehash Mrs. Biggert's question in a different form. Mr. Lyons, do you believe that nuclear waste has an intrinsic future value that would justify the cost of making nuclear waste retrievable or should it just be permanent disposal?

Mr. LYONS. That is going to be a very important question that is debated as the Administration and Congressional strategy moves ahead. I don't know what the answer will be to that and that needs substantial debate. I can argue on both sides of that.

Mr. MCNERNEY. Thank you.

General Scowcroft, could you recap for us the key issues that led to past failures and what would lead to responsible nuclear waste disposal policy today?

General SCOWCROFT. Well, in sum I think the difference between what has been followed in the past and what we recommend is the past was a top-down and it ended up we tried to direct a solution to the problem on a particular site. What we are suggesting is a process that goes from the bottom up. We identify suitable areas and then work with local communities and states to develop a consent-based process, you know, providing for say—for example, research facilities which would go along with a storage site to enable an answer to the problems that Dr. Lyons suggested. These are the kinds of things which we believe and which in the past have worked in this country and overseas to develop people coming forward. And in Sweden they were bidding for the right to host a site. So that—so we are optimistic about that.

Mr. MCNERNEY. So to what degree was that sort of approach taken? Has that approach been taken at Yucca Mountain? Is it—I mean there is some of that that has taken place but clearly it is not enough.

General SCOWCROFT. Well, there was some at Yucca Mountain but in the end the Congress decided that no other sites would be considered and Yucca Mountain was it. The local communities, the county communities surrounding Yucca Mountain are supportive.

Mr. MCNERNEY. Right.

General SCOWCROFT. The State as a whole is not and that is where the deadlock came.

Mr. MCNERNEY. Has that well been poisoned enough that Yucca Mountain is basically not usable now or is there still enough political goodwill to move forward with that site?

General SCOWCROFT. Well, I would just have to speak personally there, but my sense is that if our recommendations are implemented, that Yucca site can be a—the Yucca Mountain facility can be a part of this consent-based agreement.

Mr. MCNERNEY. Good.

General SCOWCROFT. And if the communities concerned can agree, yes, it could be.

Mr. MCNERNEY. Thank you.

Mr. Meserve, why should the government continue to invest in development of new nuclear technologies when it has been in the commercial arena for 50 years already?

Mr. MESERVE. Well, it is in fact the case that we have currently deployed plants that have been in existence for some time, but this is a technology that is a complicated technology in which there are opportunities still for advances that will enhance safety, will enhance efficiency, will enhance stability—sustainability of the system and so this is—we are not at the end of the road on this and these are hugely expensive technologically sophisticated matters in which involvement by the Federal Government has traditionally been very important and I believe that will remain so in the future.

Mr. MCNERNEY. Thank you.

I yield.

Chairman HALL. I thank the gentleman for staying within the five minutes.

At this time, I recognize Mr. Fleischmann, the gentleman from Tennessee. And I want to thank you, Congressman, for my visit to Oak Ridge. That is the site of where the Manhattan Project was launched long before you were born. And some of us at that table and I remember that. And they had a computer simulation of a nuclear reactor at Oak Ridge there. That is a step in the right direction. I recognize you for five minutes and thank you for your service.

Mr. FLEISCHMANN. Yes, sir, and thank you, Mr. Chairman, for your visit. Appreciate that very much. And gentleman, thank you all for being here today.

I am Chuck Fleischmann. I represent the third district of Tennessee and that has got all of Oak Ridge, ORNL, Y-12, and the great history that the Chairman alluded to and a great future. And I have enjoyed working with DOE.

In regard to this issue, I want to thank you all for your commitment to the research and development, the SMRs. I think that is critically important to our future. I do think that nuclear is an important part of our all-of-the-above energy policy and I want to see that move forward.

To touch on some of the issues that both my Republican and Democratic colleagues have touched on, though, I do have some questions about this reprocessing issue. General, I do understand that with all—as you have said, with all processes there is going to be some waste, but it appears to me that other countries have a vigorous reprocessing program already in place, and I would like to ask all three of you all if I may, why are there impediments? Why are we talking possibly a decade or two decades before we can make a decision? It is my understanding that over 90 percent of the fuel can be reprocessed. Where are the impediments, gentlemen?

General SCOWCROFT. Well, Mr. Fleischmann, there are countries who reprocess. They do not reprocess to eliminate waste and certainly don't reprocess to save money. There are other objectives to reprocessing like to separate elements of the fuel cycle which can be dangerous in terms of nonproliferation and so I think we are focused on the waste but in the background is the whole issue of nonproliferation in which we feel the United States has to be a leader. We do believe that reprocessing has a future or we would not be pushing R&D for it, but what we really say is that at the present time, there is no kind of reprocessing which eliminates the need which we are designed to study that is permanent depository for some of the results.

Mr. FLEISCHMANN. Thank you.

Mr. Meserve?

Mr. MESERVE. I might just add that as the General has indicated that you don't fundamentally change the waste problem. You still have waste you have to deal with. Regardless of whether you reprocess or not, you are going to need a disposal facility. What has fundamentally changed over the years is I think a lot of the initial interest in reprocessing and recycling was the belief that we had limited uranium supplies and that it was going to be necessary to recycle to extend the resource. That may prove true in the long-term, that there is value in being very conservative in our use of

resources. But at the present time, most studies that have examined this have determined that the cost of doing the reprocessing is excessive as compared to just mining uranium and doing a once-through fuel cycle. It has turned out that there is a lot more uranium than people had known at the time the Morris facility was constructed, for example.

And so that there is not the economic incentive to proceed, which I think is—there is nothing—there is no barrier today from a private company to come forward and go to the NRC and say they want to build a reprocessing facility. They can do it. There is no interest that I am aware of in doing that just because the economics don't justify it.

Mr. FLEISCHMANN. Thank you.

Mr. Lyons?

Mr. LYONS. I would agree with the comments made by my colleagues that certainly one needs to evaluate the nonproliferation and the environmental aspects as well as the economic. And as Dr. Meserve just indicated, those economics hinge quite a bit on the availability of long-term uranium supplies. One of the research programs in which Oak Ridge is leading is the extraction of uranium from sea water. Whether that will prove to be possible economically, I don't know, but that work is going to play a significant role in determining whether the economics of the overall system are going to dictate—I think probably be decades from now—a decision that reprocessing will be driven by the need to better use the resource or whether there will be sufficient low-cost uranium to ensure a future as long as we see that it will be needed. So those are major questions.

Mr. FLEISCHMANN. Thank you, Mr. Secretary.

Mr. Chairman, I yield back.

Chairman HALL. The gentleman yields back.

At this time I recognize—here we go again—Ms. Edwards from Maryland.

Ms. EDWARDS. Thank you, Mr. Chairman. I am going to take that as a compliment.

And thank you, gentlemen, for your testimony today.

I want to actually explore this idea of consent-based approach to siting because it does seem to me that under—in your discussion, General Scowcroft, you say that the first requirement in siting is to—obviously to demonstrate adequate protection for public health, safety, and environment. We can probably all agree with that. But then you go to the next sort of threshold which is finding sites where all affected units of government, including the host state or tribe regional and local authorities—that is a lot of government—and the community are willing to accept a facility that has proved. And that has proved exceptionally difficult. Using that sort of basic criterion, don't you think that in any case, even in a next evaluation, that Yucca Mountain would actually fail that test?

General SCOWCROFT. Well, I think the way it appears at the present, yes, because there has been no indication that the elements necessary—community and state—can come to an agreement. But in a consent process and in a discussion of what the benefits might be back and forth, that could change. So I—and I would not rule it out.

Ms. EDWARDS. Thank you very much.

And then I want to ask, it seems to me, Dr. Lyons, when you discussed dry cask storage, that that really is just kind of a holding pattern, right? It is not by any stretch of the imagination a long-term solution. And I wonder whether we need to give a bit of a reality check from the Commission's recommendation that somehow in 6 months that the Department of Energy is going to be able to come up with that long-term solution even given your fine recommendations.

Mr. LYONS. Well, you are certainly correct, Representative, that dry cask storage is not a long-term solution. It is certainly not a final solution; it is not a permanent solution. We have research programs underway that will help to define how long dry cask storage can be safely used and that will be very important in determining the time frame that we have for evaluating other alternatives. But in the meantime, we have the waste confidence decision of the Nuclear Regulatory Commission that provides for dry cask storage 60 years beyond the end of the existing license for a location. So that gives us significant amount of time for research. How much longer than 60 years it may be possible to extend, that will be the basis of our research.

I also—you questioned whether within six months we would have a final path forward. I think the best we can do is following the guidance of the BRC, set ourselves on a path which they described as certainly consent-based but also flexible, also adaptive. Going into both the flexibility and the adaptability are going to be questions like how long can you use the dry casks? What progress are we making on reprocessing technologies? And all those I think will play together in finding an eventual path forward for the Nation's used nuclear fuel but I think we need to start.

Ms. EDWARDS. Thank you. And Chairman——

Mr. MESERVE. May I just——

Ms. EDWARDS. Absolutely.

Mr. MESERVE. —add a though here is that we are going to be storing this material anyway. I mean we aren't going to have a disposal site regardless of what happens to Yucca Mountain that can take this fuel, so we are going to have—we have 65,000 metric tons of this stuff that is sitting out there and it is going to be sitting there for many decades. The question that we raise, the storage is going to happen. The question is where is it going to happen? At the moment, it is all disposed of at the sites of the facilities, and we have 10 sites around the country where the facility is gone, the plant is gone, the people want to use this land, it is valuable land, and what we have there are dry casks with a lot of guards standing around them watching them. We think that there are benefits in moving this material to free up that land; it is an equity consideration. It also could save money in that that security is expensive and you could consolidate it to save money. And it gives you lots of other advantages in terms of pursuing the R&D, creates a buffer capacity when you actually have a disposal site. You can receive fuel independently of whether a disposal site is ready to accept it, repackage it if you need to. There is lots of flexibility that it gives you if you were to have such a capacity.

Ms. EDWARDS. And I have run out of time. At some point, I would love to have an answer to the question about the new organization that you propose in this environment in which there is not a lot of new organizations being proposed and how we would make sure that we pay for that. I presume, Mr. Chairman, that that would come from the annual fees that we collect that seem to go into the general fund.

And with that, Mr. Chairman, thank you.

Chairman HALL. And I meant it as a compliment to you. I learn more from your questions than I do from a lot of the answers. And I will yield you a little more time if you want to ask that question.

Ms. EDWARDS. Thank you, Mr. Chairman. And if you all could respond to that because I do think that the question of a new organization and whether—is that because of a lack of confidence in the Department of Energy that you need something new and independent as an organization? And then it would have to be stood up in addition to the array of responsibilities that you indicated.

Mr. MESERVE. Our recommendation is not intended to be a slap at the Department of Energy. It has succeeded with the WIPP site. The challenge we see is that this is going to be a long-term problem that has to be dealt with over perhaps centuries that you need a continuity and a focus to that, that it has to be achieved over time and we think that can be best done by a separate organization that has that as its business. The Department of Energy, the reality is is that you have changes of administrations, changes of officials, you know, in a period of perhaps four or eight years and so you don't have that continuity of the management and you have the deflected of many other issues that they have to deal with. And so I think having the necessary focus is one that argues for and justifies setting up this entity that has that as its business and it is set up to serve that sole function.

It would require and we do recommend making sure that the funds that have been dedicated to go for this function, they are available to them independent of an appropriation process.

Chairman HALL. Do you yield back?

Ms. EDWARDS. I do, Mr. Chairman.

Chairman HALL. I thank you for that.

At this time I recognize Mr. Benishek, the gentleman from Michigan.

Mr. BENISHEK. Thank you, Mr. Chairman. I appreciate the gentlemen being here on the panel and I have really been enjoying all the questions. It is a great—this bipartisan participation.

As you may know, I represent Michigan's first district. We have Big Rock Point, which there is—we have a photo of here which is one of the decommissioned plants that has actually been decommissioned in 1997 and then for the last 15 years has been sitting there with these dry casks. And the site originally took up about 400 acres and now there is 300 acres that have been returned to their natural state, but unfortunately, there is these eight casks of 19 feet tall and 160 tons that don't have a home. And it is costing us millions of dollars a year to protect that site. And I know that we can't make it disappear but, you know, I am a little frustrated over the fact that there is a lot of talk and there doesn't seem to be much action. And how soon are we going to get going on this plan

to site this? I mean are we talking to communities already? I mean we seem to have an idea of how to do this, you know, the eight points in the—you know, from below up, getting everybody involved but I kind of share Mr. Hall's concern that we sort of have done this a little bit and, you know, the state changed their mind or, you know, political considerations have taken place and, you know, my district has got these eight casks and there is lots of other places around the country that are the same. So what can we do this year, Mr. Meserve?

Mr. MESERVE. Well, I do think that there are some things that we can do that are productive. We can start the process—the Department could start the process of trying to engage with communities to try to identify interest in being able to proceed. There is a possible barrier that is created by present law that—the law that governs Yucca Mountain, the same statute provided that there would not be an opportunity to create a storage location until there was a license for a disposal site. I think the thought on the Congress was—is that people might just grab the storage site and not proceed with the disposal site which we obviously have to do and that we are afraid it would disrupt a program that—leading towards creation of a disposal site. And I can't comment on what the thought of the Congress was at the time that this provision was put in place but I believe that was what was underway.

So that there are some needs that are squarely within the jurisdiction of this body to try to help the very legitimate concern that your community feels about having this site with a deal that they made to have a nuclear power plant there but not to be a long-term site that was holding this fuel with land that could well be used for much more valuable purposes.

Mr. BENISHEK. It was on the shore of Lake Michigan for crying out loud.

Mr. Lyons, you have an idea it sounds like.

Mr. LYONS. Well, the point I would like to make, Mr. Benishek, to follow on the point that Dr. Meserve made is really what he was discussing is why in my remarks I emphasized that as we work towards preparing for Congress an Administration strategy which is due within 6 months, it can't be just the Administration. There is going to have to be close cooperation with Congress as we work together towards a package that can lead towards a future to address the concerns that you are describing. But just as Dr. Meserve described, creating the site that you would like us to create is blocked by the Nuclear Waste Policy Act and that is just an example of why working together is essential.

Mr. BENISHEK. Can't we be doing all these things at the same time? I mean that is what I am—you know, can't we be searching for sites, you know, coming up for licenses, working out a plan instead of like doing one thing and then the other? I mean I want to know what I can do to make this process go forward and I would be happy to try to address this legislation that you are talking about. I mean I just need some ideas.

Mr. MESERVE. Well, I think there is a chicken-and-egg problem here in that I don't think—it may be very difficult to have a community agree to have a storage site without them having some confidence whether it is just going to be a storage site. It is not going

to be a site where this material is going to sit indefinitely. And so I think that we do emphasize in one of our strong recommendations is that we ought to proceed with all speed to try to identify a disposal site, and having that program in place we hope would be reassuring to a community that would contemplate a storage site and they could have some confidence that the material having moved there wasn't going to mean it stayed there forever.

And of course it could be that the storage site is the disposal site. We don't foreclose that option, but I think there is a lot of flexibility that has to exist and work that this entity that we describe would pursue to try to find a willing community to be able to take these sites.

Mr. BENISHEK. Thank you. I think my time is up but I am looking forward in this Committee to be working on legislation to try to make this process move faster. Thank you.

Chairman HALL. I thank you and I thank you for your questions.

The General mentioned community support. I might mention community opposition, too, is pretty strong and maybe, Mr. Benishek, if you were present in the Senate, we might get that spent fuel moved a little bit quicker. You may be thinking about that some.

At this time I recognize the gentlelady from California, Ms. Lofgren, for five minutes.

Ms. LOFGREN. Well, thank you, Mr. Chairman. I think this is a very important and useful hearing. And as I listen—and I guess it is easy for me to say I don't have a nuclear power plant in my district, I don't have spent fuel in my district, so I am looking not from a district point of view but just what is the Nation going to do? And I am mindful as we discuss these matters, it is very difficult for us to overtly say we don't know anything like what we are going to know later. I mean if you think about who won the Nobel Prize in 1912, it will Nils Gustaf Dalen, and do you know what he won it for? It was for a flash controller so that the gas lights could be turned off at night. That was the hot technology 100 years ago. And so to think that we have all of the information and technology and science that we are going to have to deal with this I think is just not likely. It is not likely. And so I am very interested in the dry cask storage opportunities. I don't know as much as I would like to know about that and it sounds like, Dr. Lyons, that maybe none of us knows all that we would like to know about that. How resistant is that storage to pilfering? I mean what is the nonproliferation implication for that storage mode? How long can it safely be contained and have we looked at not just the containment but also the geologic conditions of each site? Because I think those are critical elements in deciding what to do. I think sometimes deciding proactively not to act may be the most responsible thing to do. Every time you move something, you open up risk to accident, to terrorism and the like, so I think those things need to be balanced, the movement versus the in place. And I am wondering do we have that kind of comprehensive analysis going on on the dry cask storage to let us know how much time do we have or can we buy for the scientific world to move forward?

Mr. LYONS. Well, if I could offer several points of view on that very excellent question, I might note for starters that any dry cask

storage site is licensed by the NRC, so questions that you addressed such as the security, such as the geologic stability, those would all have to be part of the evaluation by the NRC before the dry cask storage site was authorized. Of course to the extent that is at a reactor site or former reactor site, those same questions were asked with regard to—

Ms. LOFGREN. If I may, in California we call nuclear reactors a way to discover previously undiscovered earthquake faults.

Mr. LYONS. I probably shouldn't comment on that. You raised a very, very important point that is very prominent in our thinking about the potential risks of handling and re-handling used fuel. One of the areas that we are starting in now on a program which certainly fits in with some of the BRC suggestions is the need to try to move towards a standardized cask system. The casks that are in place, for example, your colleague's Big Rock Point, are not exactly transportable and they would be—at some of the sites, cask configurations have been used that will require exactly what you said, of repackaging in order to transport. We need to start—and my program is starting—a program to work towards standardized systems that would look at casks that can be used not only for storage but also eventually for transportation and disposal. And that minimizes exactly the point you were making. The fewer the number of times you handle that fuel, the better off everyone is. So that is very much a part of our research program.

Ms. LOFGREN. I would just close by—my time is almost out but—by noting that given how much more our—we will know in 100 years than we know today and that the half-life of some of the components are in the thousands of years, it seems to me not irresponsible to try and preserve this situation for that to occur. If we had the 1912 technology insisted upon at that time, we would have a very different society today. I—you know, I am just anxious that whatever we do, we don't foreclose the options—you know, the idea that we would bury waste because it is a problem when in fact it may be an opportunity I think in 100 years or in 200 years is very much in my mind as we look at this issue and I hope that we can bring that perspective to it.

And Mr. Chairman, my time has expired.

Chairman HALL. I thank you for your time. I don't think I can make another 100 years but we will take a shot at it.

At this time I recognize Congressman Mo Brooks from Alabama for five minutes.

Mr. BROOKS. Thank you, Mr. Chairman.

I appreciate you all being here today with your testimony. Out of curiosity, do any of you all know how much this report cost the taxpayers of America?

General SCOWCROFT. About \$10 million to the two-year study.

Mr. BROOKS. All right, thank you. About \$10 million. In looking at it, Mr. Scowcroft, I am looking at some of your testimony. It says—and I am going to quote from it on page 2—“what we have found is that our Nation's failure to come to grips with the nuclear waste issue has proved damaging and costly. It will be even more damaging and more costly the longer it continues damaging the prospects for maintaining a potentially important energy supply option for the future. This failure is also costly to utility ratepayers

who continue to pay for a nuclear waste management solution that is yet to be delivered, and to U.S. taxpayers, who face billions in liabilities as a result of the failure to meet federal waste management commitments." And then it adds, "the need for a new strategy is urgent." How much time have we already spent on Yucca Mountain? Do any of you all know offhand?

General SCOWCROFT. Twenty-five years?

Mr. MESERVE. The process that started with Yucca Mountain was about 1982 when the Nuclear Waste Policy Act was initially passed and—so it was selected by the Congress in 1987.

Mr. BROOKS. So we have been at it basically for a quarter of a century.

General SCOWCROFT. Um-hum.

Mr. BROOKS. And how many tens of billions of dollars have we already invested in Yucca Mountain?

General SCOWCROFT. About 15.

Mr. BROOKS. About 15 billion. And how much do you anticipate we would have to invest in some other site? Ten, fifteen billion starting from scratch? Twenty billion? Thirty?

General SCOWCROFT. Could be.

Mr. BROOKS. Could be higher? Going to what I found really interesting about your report, it says that the solution to this site location problem is to get local communities to consent and I was very much enamored with that conclusion but on page VIII of the report, it adds, "finding sites where all effective units of government, including the host state or tribe, regional and local authorities, and the host community are willing to support or at least accept a facility has proved exceptionally difficult. And if anything, that is probably an understatement. Out of curiosity, are any of you aware of any communities that are both environmentally acceptable and secure wherein the cities, counties, and states that would be impacted have said yes, we would accept a nuclear depository of the magnitude that we have discussed in this hearing today?"

General SCOWCROFT. I would point to the WIPP facility in New Mexico.

Mr. BROOKS. Well, is that of the same scope and magnitude of what we would need?

General SCOWCROFT. We visited the WIPP site and there was great enthusiasm for proceeding and expanding the site to include storage facilities. So that gave us a great deal of optimism.

Mr. BROOKS. So is it your position that the WIPP site in New Mexico—would all the communities involved, including the state government, would be more than willing to accept itself as a depository for all of our nuclear waste that we are talking about not going to Yucca. Is that what you are saying?

General SCOWCROFT. No, I am not saying that. What I am saying is that the WIPP process and the way it is operating now I would point to as a success story.

Mr. BROOKS. That is a success story and that is, as I understand it, transuranic—

General SCOWCROFT. Yes, it is.

Mr. BROOKS. —material?

General SCOWCROFT. It is. It is solely defense waste. It is not spent fuel.

Mr. BROOKS. Did you all spend any time considering other options other than seeking consent which your own report says would be very difficult to obtain such as changing the laws that enable communities around the country to go to court and delay the process almost indefinitely—or in this case years if not decades?

General SCOWCROFT. I don't know. I don't know whether we discussed—

Mr. BROOKS. I mean you are talking about a situation that your own report says is urgent.

General SCOWCROFT. Yes.

Mr. BROOKS. And we have already spent over \$10 billion by your own testimony on Yucca Mountain.

Mr. MESERVE. Well, let me—perhaps I should intervene here—

General SCOWCROFT. Yeah, go ahead.

Mr. MESERVE. —if you would like me to. We have a wide array of laws that involve public involvement and I would think they would be outraged if we were to somehow circumvent, for example, requirements that you have environmental impact statements that involve public output which give you opportunities for judicial review, have all NRC and regulatory requirement process that at its core involves a large amount of public involvement with opportunity for review in the courts. And so I would seriously question whether a cram-down solution would likely to be, first of all, consistent with the way we have handled difficult issues in our country over the years.

Mr. BROOKS. Well, outside this one site in New Mexico, are you familiar with one place in the country where the consent option has worked, where they have come forth?

Mr. MESERVE. Well, I think WIPP is—

Mr. BROOKS. Well, I said with that one exception.

General SCOWCROFT. I don't know that we have tried it anywhere else.

Mr. MESERVE. Well, let me say that there are—you know, you have all kinds of waste that people have to deal with that you have hazardous waste, you have low-level waste sites that have been difficult to establish sites but there have been some successes. And so I wouldn't say that it is necessarily in this country impossible to locate a site that may not be necessarily at first blush attractive. And what that has to involve is providing some incentives of various kinds to the communities, which is what happened with WIPP, what happens with many of these other sites. And eventually you may get total agreement but at least acquiescence. And that is enough. This—no one is denying that it is not going to be—that it will be easy to have a consent-based process but we have an example, of course, in Yucca Mountain where we tried something entirely different and it just hasn't worked.

Mr. BROOKS. Well, the Chairman has allowed me a little bit of extra time so I will conclude with this last question. I agree with you it is wonderful if we can get communities, cities, counties, and states to consent for a location that is environmentally sound and also secure for national security reasons, but what is your Plan B if we don't get that consent?

General SCOWCROFT. We don't have a Plan B because we do believe that in this process—this is a political process and you are the

political experts; we are not. But in looking at what has worked and what hasn't worked, there is no magic thing that you can wave a wand and say everything is perfect, let's go. It is fundamentally a political process. What we said in our looking at the country and around the world that this process is the only one which has allowed political entities to move forward. And so we are optimistic that it can work. But it is not going to be an immediate solution; it is going to take time. It is—and we say it has to be adaptive. As we move forward, we have to try different things, different incentives for communities to move forward. But this is not alien to you. You do it on prisons, you do it on different kinds of—there are all kinds of disagreeable things that can be made agreeable under certain conditions.

Mr. BROOKS. Well, I thank you for your insight and your candor and my time has well expired.

Mr. Chairman, thank you for the additional time.

Chairman HALL. Thank you for the good questions. Another reason I think that safety review ought to be released.

I now recognize Mr. Lipinski, the gentleman from Illinois.

Mr. LIPINSKI. Thank you, Chairman Hall. Thank you for holding this hearing on this important issue. I want to also thank the BRC for your work and I know, General Scowcroft, you certainly know a lot about politics, not just us up here. You certainly do know a lot about it.

And I am a strong supporter of nuclear energy and I think that we have to embrace nuclear energy, but that doesn't mean we are ignoring the issues that are involved, so I think that this—the BRC's report is very important.

One thing that I want to raise, I was pleased that the BRC's final report recognizes the importance of transportation, where transportation is going to come in linking the storage of nuclear waste if we were going to be moving the waste from where we are storing it onsite right now. One question I would want to ask is what would you recommend that this Committee or the Transportation Committee—which I also sit on—do or that Congress does in order to right now address this issue of transportation? Because as I said, I think we need to embrace nuclear energy. My State of Illinois certainly has. But I think we have to make sure that we are doing all we can to address the important issues of waste and what we are going to do with that waste. So where does transportation come in and what do you think Congress should be doing right now to help address that?

General SCOWCROFT. Transportation is a very important part of all this. When we issued our first draft of our report for public comment, we did not have transportation as one of the eight elements. The comment showed a deep concern about transportation issues and so we gave that more consideration than we had in our initial study. It is extremely important. The experience we have is very encouraging. The system which, again, back to the WIPP facility, it draws its waste from a variety of areas around the West. The system has worked very well and there has not been a serious accident at all. But what we—what they have developed gradually is a process where the Western Governors Association has supervised it and they have alerted all of the fire departments and so on along

the way so that if there is an accident, they are prepared to deal with the particular aspects of that accident and not say oh, my goodness, what do we do now? So that is a process we think is one of the first things that needs to be done. And that is to educate the states and entities about the process of transportation. We think it is a manageable problem.

Mr. LIPINSKI. Mr. Meserve, do you have any further comments or—

Mr. MESERVE. Well, I—the only thing I would say to supplement General Scowcroft's comments is that there are some things that need to be done by the relevant regulatory agencies to bring the requirements up to date. That is not—that is something they have authority to do already. In order to—the area—one area where it does seem to me in transportation where there are some opportunities for Congressional action is that in order to have the kinds of relationships that one would hope would have between the federal aspirations for transport and the state and local officials is to make sure that you have training programs, educational programs, outreach programs that enable the interaction of those people so that they become knowledgeable and develop the capacities to deal with situations that they might confront. That requires funding. And there is some funding that has been part of the WIPP facility to allow that kind of training to occur and we would recommend that similar capacities model basically on what Congress has done with regard to funding for transportation for WIPP be something that be embodied for dealing with affected local and state officials that will have to be a part of a process of a major transport campaign.

The initial problem is you don't know where the stuff is going of course until you have a disposal site—

Mr. LIPINSKI. Um-hum.

Mr. MESERVE. —or a storage facility, but you should know where it is coming from. So you have some communities you know you have to be dealing with. And so you can start this process now and it is going to take time.

Mr. LIPINSKI. Okay, thank you. And as a lot of good questions asked earlier, I know Mrs. Biggert especially raised the advanced fuel cycles R&D going on and it was brought up about the great work going on at Argon and hopefully we can continue to—when we talk about funding properly—fund that also.

I yield back.

Chairman HALL. And I thank you.

At this time, I recognize the gentleman from California, Mr. Rohrabacher.

Mr. ROHRABACHER. Thank you very much, Mr. Chairman.

General and Dr. Meserve, you mentioned in your joint testimony that deep geological disposal is the scientific-preferred approach and this has been reached by every expert panel that has looked into this issue and every other country pursuing a nuclear waste management approach. Let me remind everyone that in 1957, which was before this Science Committee ever existed, the National Academy of Sciences recommended that deep burial of nuclear waste, that that would be the way we solve this problem. In 1982, the Nuclear Waste Policy Act made that national policy. Now,

those dates may seem—General, you are a little bit older than I am and I am—

General SCOWCROFT. A lot.

Mr. ROHRABACHER. —getting to be older myself. Those don't seem so long ago to you but in fact that is a long time ago. And we are still talking about putting waste in a hole. That is a—we are talking 30, 40 years ago and yet we have this Blue Ribbon panel to tell us something that was a solution 30 or 40 years ago. Haven't we progressed? Hasn't there been new technology? Well, there has been. Secretary Chu mentioned and this Blue Ribbon Commission and of course he said that in referring to this, we realize that we know a lot more today than we did 25 or 30 years ago. We will be assembling a Blue Ribbon panel to look at this issue. We are looking at reactors that have a high energy neutron spectrum that can actually allow you to burn down the long-lived waste. These are fast neutron reactors. We have spent \$15 billion, you want to spend billions of dollars more in order to develop a plan of putting this in a hole and we don't even know if we can get anybody to agree to allow the hole to be near their community, yet we now have companies that are capable of building these fast neutron design reactors, Toshiba's 4S, GE's PRISM reactor, General Atomics' EM2 reactor. All of these can take the waste that we are talking about and burn it as fuel. Up to 97 percent of it will be burned as part of the process and eliminate the need for spending all of this money putting things in holes. Now, how much money have we spent in the last year on nuclear power research? I guess that should go to you, Mr. Secretary.

Mr. LYONS. Yes, we have a program on reactor technologies and that is in the last year in the order of 150 million.

Mr. ROHRABACHER. All right. How much did we spend on nuclear energy research?

Mr. LYONS. Nuclear energy research? Our total budget is of the order of 800 million and about half of that is research.

Mr. ROHRABACHER. Now, I have had meetings with people who told me that the biggest stumbling block—and they could have been building these reactors which would have eliminated this problem—that the biggest stumbling block is the first \$100 million because they have to have the blueprints and that is a risk factor in putting together the entire project. And it costs about \$100 million. So we have spent billions of dollars figuring out how to put something in a hole but our government hasn't been willing to put out that \$100 million that would permit the private sector to spend the money necessary to solve this problem.

You know, to say that this is frustrating on this side of the questions is to put it mildly and there have been people debating it—I have been advocating this and I know these companies that I have been talking to for at least five years, this is not a secret that we can burn 97 percent of the waste instead of—as the General pointed out—1 percent of the waste which our current system does. You know, we are talking about transportation, all these issues about transportation of the waste, that won't even be a problem if we burn up 97 percent of it. It will be a miniscule problem. Yet we can't get ourselves and the Department of Energy to put out the money for that one roadblock. Now, if they told me that—if these

companies have told me that that \$100 million is what is a stumbling block to developing this revolutionary new approach which would solve this problem, well, then I am sure they have told you. So why haven't we financed that?

Mr. LYONS. Again, Mr. Rohrabacher, we do have programs looking at advanced concepts. You have described a number of advanced concepts. Some of them require at least several miracles before they will be able to be fielded. Some of the suggestions you have made involve advanced materials that simply don't exist.

Mr. ROHRABACHER. Yeah, one of the miracles is getting the bureaucracy to get off their butt. That is one of the miracles that we are going to have to have to have these reactors. Now, we are going to have study after study, Blue Ribbon Commission after Blue Ribbon Commission and we are going to end up talking about spending \$15 billion putting nuclear waste into a hole which we could have done 15, 20, 40 years ago. This is upsetting.

The bureaucracy, Mr. Chairman, is getting in the way of us moving forward. Those companies have not given me that word, that they have to have miracles in order to build it. They have told me they are ready to build now if they could get over this \$100 million hump. I suggest, Mr. Chairman, that we make this a priority in this country and quit pouring money down a rat hole that we don't need to have. Thank you very much, Mr. Chairman.

Chairman HALL. Do you yield back?

Mr. ROHRABACHER. Yes, I do.

Chairman HALL. And I thank you.

At this time, I recognize Dr. Harris, who himself as a Subcommittee Chairman has received publicity recently by simply insisting on the rules being carried out and I admire you for that. I was proud to support you.

Dr. HARRIS. Well, thank you, Mr.—

Chairman HALL. I recognize you for five minutes.

Dr. HARRIS. Thank you very much, Mr. Chairman. Let me just concentrate on one aspect of the report and that is this idea of the consolidated storage facilities because you make a recommendation that one or more consolidated storage facilities—ideally, how many storage facilities—consolidated storage facilities would it take to handle the continual flow of nuclear waste in the country? Just because it says one or more but if it becomes one then kind of morph into a repository. How many do you envision?

Mr. MESERVE. There is no technical limit that would constrain the volume of waste that was stored at a facility. It would depend on the particulars of the situation, but we certainly would have locations in the United States where all of the material could be stored. I think that the idea of possibly having multiple storage sites is to reflect some of the transportation issues. It might be nice to have one in the East, one in the West, possibly some equity issues. There may be a community that doesn't want to have all the materials in its—at its storage site. So that there are—there may be—as you point out, there may be some reasons why you would want to just have one but we didn't see the reason necessarily to foreclose the possibility that there could be several.

Dr. HARRIS. Now, but the structure you have set up and the recommendation is that what we ought to do is we ought to go ahead

with this consolidation facility but in a parallel course go ahead with a repository. But if you are only going to go ahead with one consolidation facility—and let us bring to mind the history of the handling of nuclear waste—we have gone into communities and said take our nuclear—take a nuclear reactor, don't worry, the waste won't be there forever because we will handle it. The Federal Government will come in. Don't worry, the Federal Government will handle it. We never have handled it. Now, we are going to come into a community and say let's build a new facility; this one we are going to call a consolidated waste facility and don't worry, we are going to—it is not going to be there forever; it is going to go to this repository. Given the track record, how in the world are we going to convince the community to build a consolidation facility? And it begs the question, why don't you just go to a repository? I mean it seems that what you are building is a functional de facto—except for the geology—a repository potentially because that is—let's face it, that is basically what our old nuclear plants have become. They have become de facto repositories.

Mr. MESERVE. I think you are quite correct. There will be a challenge in establishing a storage facility in a situation where the people don't believe that they will inevitably be a disposal facility. And that is why I think these things have to go in parallel so that there is—for those communities that are concerned about the long-term possibility that the material would be there effectively forever would have some assurance that the material could move. It will be easier in terms of licensing to establish a storage facility than a disposal facility. That could move forward faster but there will definitely be a challenge in dealing with the opposition. Of course, the community that was interested in having a disposal facility might well be very happy to be a storage facility in the interim.

Dr. HARRIS. And that is exactly my point, that absent what my colleague from Alabama suggested, two recommendations on how to deal with this issue of not-in-my-backyard because I will tell you, I can't imagine a community saying, you know, sure, you know, build the disposal facility. We don't want the repository because, again, the record of the Federal Government is we have turned even just reactors into repositories long-term. So why the hesitance to actually make recommendations—I am looking through here—as to how we can actually make the process work faster and better with regards to licensed—because let's face it, the hold up on the licensing has always been local issues. That is basically it. The other ones are, you know, are solvable. I don't see anything in here other than to just say well, make sure the communities approve it. Anything else that will move this forward? Is there—am I missing something? Is there something here that says this is a strategy to get these into communities?

General SCOWCROFT. Well, I think one of the—WIPP we have used to great advantage as an example.

Dr. HARRIS. And WIPP is a repository, is that correct?

General SCOWCROFT. It is a repository.

Dr. HARRIS. Okay.

General SCOWCROFT. It is a repository. And it is working very well and the local communities around the repository have actually gone out and leased land which they hope to be used for a storage

facility because they would like to expand their participation in this program. Now, that is one community but it doesn't take many communities to deal with this whole thing.

Dr. HARRIS. And one final question if I might, Mr. Chairman. You suggest that there should be some governmental chartered organization to kind of look over all these things and I assume you mean to look over the contained—I am sorry—consolidated storage facilities as well. Have—since the private sector runs most of the power plants themselves, has the option been considered of letting the private sector perhaps build and run and just get license to have a storage facility—consolidated storage facility? Does it necessarily have to be government-run or could it just be government-licensed, let the private sector deal with the issue?

General SCOWCROFT. It doesn't necessarily have to be government-run. It was our conclusion that a federal corporation was the best compromise because we think that the whole issue of nuclear material has a national security aspect and a proliferation aspect to it that means that the government has to be more involved than simply turning it over to private industry.

Dr. HARRIS. Okay. Thank you very much, Mr. Chairman.

Chairman HALL. I thank you and recognize Ms. Johnson if she wants to make any type of a final statement—not final but for today. I don't like this finality idea. I don't even like to hear an airport considered a terminal. Go ahead now.

Ms. JOHNSON. Thank you, Mr. Chairman.

I simply want to once again thank all of you for the work and time that you put into these studies and to simply share with you an article that came out recently that reported several of the candidates for President. Former Speaker Gingrich said “any deal that is reached must be agreed by the local, state, and federal officials and founded on sound science.” Former Governor Romney, “no state should be forced to accept the Nation's nuclear waste against its will.” And Congressman Paul says, “as a Member of Congress, I have always voted against forcing people in Nevada to use Yucca Mountain as a nuclear waste storage site. As President, I will work with the Nevada officials to ensure that whatever is done with Yucca Mountain reflects the wishes of the people of Nevada.” Now, I only quote that because all these people want to be our next President because it reinforces what your study shows, that it has got to start bottom up rather than top down.

So thank you very much. Thanks to all of you for being here this morning.

Ms. EDWARDS. Mr. Chairman?

Chairman HALL. Who seeks recognition? The gentlelady.

Ms. EDWARDS. I would just ask on the record there have been a number of issues raised during this hearing and particularly by Mr. Rohrabacher that I would be interested in the Committee exploring related to the newer technologies because I know I don't know a lot about them but would have some questions. And I would hope that that would be something that we could explore.

Chairman HALL. I will provide that, yes.

Ms. EDWARDS. Thank you.

Chairman HALL. And I thank you for it. That is a very good suggestion.

Questions are completed and I want to thank the witnesses very much for your very valuable testimony and for the time it took for you to get here, the time it took you to get prepared for here and the time you have given us today. But all of this is of record. We have had a court reporter taking over everything. And members and those who assist us will be reading that. It will be of great support to us in the future.

And for those of you, you three who have come to the defense of the Nation when we needed you and the national defense, you helped with the economic recovery, you have given us your time today, you are truly Blue Ribbon citizens and we thank you for your time.

At this time, Members of the Committee may have additional questions for any one of you and they may do that by mail. If we do, we hope you will answer it timely, maybe within a couple of weeks if you can. The record will remain open for at least two weeks for additional comments from Members.

And all of the witnesses are excused and are thanked very much for your time. And this hearing is adjourned.

[Whereupon, at 11:55 a.m., the Committee was adjourned.]

Appendix I

ANSWERS TO POST-HEARING QUESTIONS

ANSWERS TO POST-HEARING QUESTIONS

*Responses by Lieutenant General Brent Scowcroft (Ret.), Co-Chairman, and
The Honorable Richard Meserve, Commissioner,
Blue Ribbon Commission on America's Nuclear Future*

U.S. HOUSE OF REPRESENTATIVES COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY

Hearing Questions for the Record – with Answers

The Honorable Ralph Hall

Assessing America's Nuclear Future -A Review of the Blue Ribbon Commission's Report to the Secretary
of Energy

February 8, 2012

1. What would the impact on DOE sites that are currently storing radioactive waste, such as Hanford, the Savannah River Site, and Idaho National Laboratory, be if an entirely new search for a nuclear waste repository is initiated? Can you estimate how long these communities would have to continue storing radioactive waste, and how long they would have to wait for more permanent solutions?

Although several states have separate legal agreements with the DOE for the removal of defense high level waste and nuclear materials, the Commission has not comprehensively assessed the implications of any actions that might affect DOE's compliance with these cleanup agreements.

The importance of providing a path forward for the disposition of defense spent nuclear fuel and high level waste is yet another reason why the Commission recommends that the United States promptly resume a program leading to the development of one or more deep geologic repositories. Using the consent-based siting process, the Commission believes that it will be important—without imposing inflexible deadlines—to set reasonable performance goals and milestones for major phases of the program. The Commission believes the implementing organization might consider a range of approximately 15 to 20 years to accomplish site identification and characterization and to conduct the licensing process for a geologic repository.

2. Nuclear waste is produced as a result of a commercial activity. The private sector is responsible for fueling and operating reactors, which has been very successful. The federal government is responsible for the disposal and storage of nuclear waste, but has encountered major challenges. Further, federal responsibility for waste creates billions of dollars in taxpayer liability when the government does not meet its legal obligations.

Given the track record of the current system, would shifting the responsibility for nuclear waste management to the commercial sector and providing a strong and predictable regulatory framework serve as a more functional structure to address this issue?

The BRC believes that a federal corporation chartered by Congress offers the most promising model for the management of the nation's nuclear waste program. However, the Commission notes that other organizational structures are possible and that the manner in which the organization behaves

and delivers on commitments is more important than what specific organizational form it takes. Striking the right balance of independence and accountability is the key challenge, whether a new waste management organization is structured as a federal corporation or takes some other form. In any case, Congress must provide clear policy direction, exercise ongoing oversight, and establish the necessary funding mechanisms but should leave control of operational decisions and resource commitments for implementing the policy direction to the new organization – regardless of its structure. Those decisions and commitments, and indeed the performance of the organization as a whole, would, of course, be subject to policy, safety, security, technical, and financial review by appropriate government agencies and Congress.

3. In addition to the jobs that would result from hosting a waste storage site and federal financial payments, what other efforts can be made to earn local support? Would priority selection for future waste processing operations or other nuclear related programs be helpful to gaining local, if not state, support?

It will be important to demonstrate that the decision to host a facility can deliver real benefits (economic and otherwise) to the affected state, tribe(s), and local community(ies). Affected states, tribes, and communities will reasonably expect incentives for helping to address the important national issue of nuclear waste management. To be most effective, such incentives must be provided in ways that are generous, creative, and attentive to their symbolic content.

Besides financial incentives, benefits could include local preferences in hiring and in the purchase of goods and services by the waste management facility, infrastructure investments (such as new roads or rail lines), as well as the opportunity to host co-located research and demonstration facilities or other activities that would generate new employment opportunities and make a positive contribution to the local and regional economy. Priority selection for future waste processing operations or other nuclear related programs might be helpful to gaining local or state support, but would certainly depend on the community. For example, Spain's effort to find a volunteer host for a storage facility for spent fuel and a small amount of HLW did include a technological research laboratory to deal with waste processing, waste forms, disposal of HLW as well as spent fuel, etc. as an integral part of the facility.

In addition to locating waste management-related activities in the affected state and community, these states and communities could also be given preference in the siting of other federal projects (provided they are otherwise suitable to host those projects). Section 174 of the NWPA, titled "Other Benefits—Considerations in Siting Facilities," already specifies that the Secretary of Energy "in siting Federal research projects, shall give special consideration to proposals from states where a repository is located." This approach can provide additional benefits to host communities and states without requiring new appropriations or increasing the cost of already planned programs or projects. The Commission recommends that this provision be expanded to include states that host any waste management facilities sited by the new waste management organization and to clarify that the special

consideration applies to research, development, and demonstration facilities (not research contracts) that receive federal funding, including any federal matching funds.

It is important to note that experiences in Sweden, Finland, and elsewhere have shown that it may not be possible or even advisable to specify incentives and compensation up front; rather, in keeping with an adaptive approach, these determinations are best left to the discretion of the implementing organization and potential host governments—including communities surrounding the host community. These stakeholders will be in the best position to determine what incentives are both appropriate and in their best interests.

4. Did the BRC identify any communities interested in hosting this material without receiving direct payments from the Nuclear Waste Fund? How much funding in direct payments from the NWF would be necessary to secure the support/consent needed?

Because the BRC was not a siting commission, they did not investigate specific sites for the location of facilities nor did they examine the incentives requested by those sites to host such facilities. However, the Commission believes that the level of benefits currently specified in Section 171 of the NWPA is inadequate and recommends that the NWPA be amended to authorize the organization managing the waste program to negotiate substantial benefits—potentially well above the amounts currently contemplated in Section 171—to state and local governments, communities, tribes, or other organizations as appropriate. The specific uses of these funds and the metrics that would determine their amounts should be an element of negotiation between the federal government and local communities and governments interested in hosting facilities, but the Commission envisions that benefit payments could be used for a wide range of uses, including for economic development purposes. All such payments should be subjected to external, independent auditing.

a) Would this support or consent be durable? In other words, what happens if a state or locality agrees to host but then changes its position after new political leadership arrives a few years later as observed with Yucca Mountain?

The level of state, tribal and community acceptance of a proposed waste management facility can and likely will fluctuate over time. The Commission believes that defining the point at which the right to unconditionally opt out expires must be part of the negotiation between affected units of government and the waste management organization. The BRC recommends the right to opt out without cause should expire no later than the time when a license application for a proposed facility is submitted.

The Commission believes this approach makes sense given that under the process they have recommended, the potential host community, tribe, and state would have had to consent to be considered for a waste site, with full knowledge of the relevant safety standards and siting criteria. Further, the host state and affected tribal and local governments would have had to agree to the terms of site study and what was to be built prior to the submission of a license application. When studies were complete, a license application would be prepared, and the Commission

believes the host state and affected tribal and local governments should be given the opportunity to sign off on it before submittal. After that time, the state and other units of government would only be allowed to opt out “for cause”—such as bad faith on the part of the facility operator. Formal agreements would be in place to cover this situation.

b) What are the risks to the program if consent-based siting is not durable?

Having any process that does not create durable consent, such as the process put in place by the 1987 NWPA, will result in further controversy, litigation, and protracted delay.

5. A key recommendation in the BRC report calls for a consent-based siting process in which state and local communities must support development of a site before it goes forward. Does the BRC's call for consent-based siting apply to communities where spent fuel currently resides, or only to communities in which it might reside in the future? In other words, should the scores of communities around the country currently storing spent fuel be required to do so indefinitely without their consent?

The BRC does not believe that leaving the nuclear waste where it is – presently spread out among 75 reactor sites and a handful of DOE sites across the country – is a viable long-term plan. The BRC recommends that prompt efforts be initiated to develop disposal and storage facilities to allow for the removal of spent fuel and high level waste from their respective locations. The BRC believes that a consent-based approach to developing these disposal and storage facilities is the best way to ensure that spent fuel and high level waste does not remain stored in communities around the country indefinitely without their consent.

6. Some communities have raised concerns that construction and operation of a consolidated interim storage facility prior to the licensing of a permanent high-level waste repository will effectively result in interim storage sites becoming de facto permanent storage. What assurances would be necessary from the Federal Government to assuage those concerns and allow for consideration of a consolidated storage facility?

To allay the concerns of states and communities that a consolidated storage facility might become a *de facto* disposal site, a program to establish consolidated storage must be accompanied by a parallel disposal program that is effective, focused, and making discernible progress in the eyes of key stakeholders and the public. A robust repository program will be as important to the success of a consolidated storage program as the consolidated storage program will be to the success of a disposal program. In addition, agreements with host states, tribes and localities for consolidated storage facilities will have to recognize that fuel may remain in storage at those sites for longer than expected, and the parties involved in negotiating those agreements will need to factor in assurances, penalties, or whatever else is needed to make the facility acceptable to the host state and other units of government.

7. How does France approach interim storage? Are there any direct payments made to the host community to assure support?

France uses consolidated interim storage facilities for spent fuel and vitrified high-level waste at the La Hague facility where nuclear fuel is reprocessed. There are no separate community-hosted facilities for interim storage. France is currently going through a siting process for a deep geologic repository, which it expects to be operational in 2025.

8. The report states that a central interim storage facility can be developed in 5-10 years. What specific steps need to be taken to make that a reality? How do we ensure the evaluation of any interim or additional permanent facility is not bogged down by decades of study, as was the case with Yucca Mountain?

Using existing authority in the NWPAs, DOE should begin laying the groundwork for implementing consolidated storage and for improving the overall integration of storage as a planned part of the waste management system. Specific steps that DOE could take in the near term include:

- **Performing the systems analyses and design studies needed to develop a conceptual design for a highly flexible, initial federal spent fuel storage facility.**
- **Preparing to respond to requests for information from communities, states, or tribes that might be interested in learning more about hosting a consolidated storage facility.**
- **Working with nuclear utilities, the nuclear industry and other stakeholders to promote the better integration of storage into the waste management system, including standardization of dry cask storage systems. This effort should include development of the systems analyses needed to provide quantitative estimates of the system benefits of utility actions such as the use of standardized storage systems or agreements to deliver fuel outside the current OFF priority ranking. (These analyses would be needed to support the provision of incentives to utilities to undertake actions such as using standardized storage systems or renegotiating fuel acceptance contracts.)**

The Administration should request, and Congress should provide funding for, the National Academy of Sciences to conduct an independent investigation of the events at Fukushima and their implications for safety and security requirements at SNF and HLW storage sites in the United States. DOE, NRC and industry should continue a vigorous research and regulatory oversight effort in areas such as spent fuel and storage system degradation phenomena, vulnerability to sabotage and terrorism, and others.

Of course, implementing a program for creating a consolidated storage facility will also need a focus on related transportation issues. DOE should complete the development of procedures and regulations for providing technical assistance and funds (pursuant to section 180 (c) of the NWPAs), and begin providing funding, for working with states and regional state-government groups and

training local and tribal officials in areas likely to be traversed by spent fuel shipments, in preparation for movement of spent fuel from shutdown reactor sites to consolidated storage. Additionally, DOE and other federal agencies should reexamine and address those recommendations from the 2006 NAS *Going the Distance* study that have not yet been implemented. As a part of this reexamination, the NRC should reassess its plans for the Package Performance Study without regard to the status of the Yucca Mountain project, and if it is found to have independent value, funding should be provided from the Nuclear Waste Fund so that the NRC can update these plans and proceed with those tests.

The BRC cannot guarantee that the consent-based process will site either a storage or disposal facility without possible delay. However, other consent-based programs in Canada, France, and Spain, which all are in various stages of the siting process, stressed that several elements were critical in establishing a foundation for public trust and the support necessary for the timely siting of nuclear facilities, including:

- A clear and understandable legal framework
- An opt-out option for the local affected community, up to a certain point in the process
- The availability of financing for local governments and citizen organizations for conducting their own analyses of the site and siting issues
- Compensation for allowing the investigation and characterization of the proposed site
- A concerted effort to promote knowledge and awareness of the nuclear waste issue and plans for addressing it through mechanisms such as:
 - Seminars, study visits, and reviews conducted by the local government
 - Information to and consultation with local inhabitants
 - Socioeconomic studies and evaluations of impacts on local businesses
- Openness and transparency among and within the implementing organization, the national government, local governments, and the public.

9. The Commission report mentions a series of examples from other countries that were utilized in developing your recommendation to create a separate agency to be responsible for nuclear waste. The report highlights the successes in Finland, Sweden, France, and Japan. Yet the recommendation seems to ignore the one thing that each of these have in common, which is that in each case the waste producer is responsible for waste management. The final report preserves the notion that management of commercial waste should not be the responsibility of waste producers despite evidence that suggests that making waste producers responsible is key to solving nuclear waste programs. Why does the BRC continue with this model?

The BRC's recommendations do not exclude the possibility of private industry (or the waste producers) having the responsibility for managing nuclear waste. While the Commission believes a federally-chartered corporate structure offers particular advantages, previous studies have concluded that a number of different organizational forms could also get the job done. Our analysis was mindful of this fact, and also of the reality that a significant share of the waste destined for a repository (accounting for about 20 percent of the total life-cycle cost of the repository, according to the latest DOE estimate) was produced by national defense activities and other government programs.

Regardless of the organizational form of the waste management entity, the Commission believes that the extremely long periods of time for which nuclear waste will need to be protected warrant continued involvement of the federal government in some oversight capacity.

In the case of Spain, which the BRC cited as the most recent example of a successful effort to site a central storage facility using a consent-based process, the waste management program is the responsibility of a government corporation rather than the waste producers.

U.S. HOUSE OF REPRESENTATIVES COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY

Hearing Questions for the Record – with Answers

The Honorable Randy Neugebauer

Assessing America's Nuclear Future -A Review of the Blue Ribbon Commission's Report to the Secretary of Energy

February 8, 2012

1. You mention in your testimony that the new consent-based approach to siting "should include a flexible and substantial incentive program." How much can we expect these incentives to cost, and do you envision these benefits to be purely financial or will they include other types of benefits?

The BRC does not have an expectation of what the incentive program will cost, because as we have cautioned, it may not be possible or even advisable to specify incentives and compensation up front; rather, in keeping with an adaptive approach, these determinations are best left to the discretion of the implementing organization and potential host governments—including communities surrounding the host community. These stakeholders will be in the best position to determine what incentives are both appropriate and in their best interests.

The Commission believes it is important to demonstrate that the decision to host a facility can deliver real benefits (economic and otherwise) to the tribe, state, and local community. Affected states, tribes, and communities will reasonably expect incentives for helping to address the important national issue of nuclear waste management. To be most effective, such incentives must be provided in ways that are generous, creative, and attentive to their symbolic content. Besides financial incentives, benefits could include local preferences in hiring and in the purchase of goods and services by the waste management facility, infrastructure investments (such as new roads or rail lines), as well as the opportunity to host co-located research and demonstration facilities or other activities that would generate new employment opportunities and make a positive contribution to the local and regional economy.

2. I understand that the Blue Ribbon Commission was not chartered as a siting commission, but do you expect that there are multiple, if any, communities in the United States that have the geological characteristics necessary for long-term storage of nuclear waste and will be able to establish local and state approval of establishing a long-term storage site in their area?

Since 1954, when the Atomic Energy Commission (AEC) initiated the search for a deep geologic repository, more than 60 regions, areas, or sites involving nine different rock types have been investigated. It is certainly likely that favorable geology for deep geologic disposal exists. However,

because the BRC was instructed not to examine the suitability of specific sites, we cannot comment on which sites specifically offer suitable geology for disposal and have a potential for public support.

*Responses by The Honorable Pete Lyons,
Assistant Secretary of Nuclear Energy, Department of Energy*

QUESTION FROM REPRESENTATIVE JUDY BIGGERT

- Q1. How does DOE plan to prioritize its nuclear energy research activities in light of the BRC findings? What nuclear energy research and development programs will receive lesser emphasis in order to provide sufficient resources to BRC-recommended activities, such as the Used Nuclear Fuel Disposition Campaign?
- A1. To ensure that nuclear power continues to be a safe, reliable resource for our nation's long-term energy supply and security, the United States must put in place a sustainable fuel cycle and used fuel management strategy. To advise the Administration, Secretary Chu convened the Blue Ribbon Commission on America's Nuclear Future (BRC). This expert panel completed their final report and recommendations in January of 2012. The Administration is giving full consideration to the BRC recommendations as we work to define a path forward. The Administration anticipates providing some additional information on that work later this year, and will work with Congress to implement a new strategy to manage our nation's used nuclear fuel and nuclear waste. Decisions about future prioritization of funding will be made through the standard planning and budgeting processes.

Funding for the Used Nuclear Fuel Disposition subprogram increased from \$32.5 million in FY 2011 to \$59.7 million in both FY 2012 Enacted and the FY 2013 Request. This increase was offset in FY 2012 in the Fuel Cycle Research and Development program by reducing or eliminating funding for activities that could be combined and/or streamlined, such as the Modeling and Simulation subprogram and the Transmutation Research and Development subprogram. Modeling and Simulation activities were consolidated in NE's Nuclear Energy Enabling Technologies program and focused on activities related to fuels

development. Transmutation Research and Development was consolidated in FCR&D's Advanced Fuels subprogram and focused on activities supporting nuclear data development for fuels design.

The mission of FCR&D continues to be both: (1) develop used nuclear fuel management strategies and technologies to support meeting federal government responsibility to manage and dispose of the nation's commercial used nuclear fuel and high-level waste, and (2) develop sustainable fuel cycle technologies and options that could economically improve resource utilization and energy generation, reduce waste generation, enhance safety, while limiting proliferation risk.

FCR&D funding in FY 2012 Enacted and the FY 2013 Budget Request continue to support both parts of the mission. Near-term program objectives outside the Used Nuclear Fuel Disposition subprogram that continue to be supported are:

- Identify and test options to potentially increase accident tolerance of light water reactor fuel.
- Select preferred sustainable fuel cycle options for further development.

Some long-term research and development on advanced fuel cycles is being refocused to the high-priority issue areas of used nuclear fuel disposition activities and research and development into accident tolerant fuels in response to Fukushima. This includes separate effects testing and advanced characterization of nitride and mixed oxide ceramic fuel. In addition, feasibility studies of fast reactor fuel will be delayed.

QUESTION FROM REPRESENTATIVE JUDY BIGGERT

2. What research activities do you think the Nuclear Waste Fund could be used for? For example, could the Fund be used to build the suggested co-located R&D lab?

A2: The Nuclear Waste Fund could be used to fund any research activities under titles I and II of the Nuclear Waste Policy Act that are needed to support DOE's commitment to meeting its obligation to dispose of used fuel and high-level radioactive waste. Examples of such activities include certain storage and transportation activities as laid out in the FY13 Budget.

QUESTION FROM CHAIRMAN RALPH HALL

- Q1. What would the impact on DOE sites that are currently storing radioactive waste, such as Hanford, the Savannah River Site, and Idaho National Laboratory, be if an entirely new search for a nuclear waste repository is initiated? Can you estimate how long these communities would have to continue storing radioactive waste, and how long they would have to wait for more permanent solutions?
- A1. There is no near term impact to the DOE sites. Currently, the Department is working to treat and package the defense related HLW and SNF at its sites for continued safe interim storage and future disposal. These activities are expected to continue for several decades. While interim storage can continue safely onsite for 50 years or longer, permanent disposition is ultimately needed for the Department to complete site cleanup activities and fulfill regulatory commitments.

QUESTION FROM CHAIRMAN RALPH HALL

- Q2. Nuclear waste is produced as a result of a commercial activity. The private sector is responsible for fueling and operating reactors, which has been very successful. The federal government is responsible for the disposal and storage of nuclear waste, but has encountered major challenges. Further, federal responsibility for waste creates billions of dollars in taxpayer liability when the government does not meet its legal obligations.

Given the track record of the current system, would shifting the responsibility for nuclear waste management to the commercial sector and providing a strong and predictable regulatory framework serve as a more functional structure to address this issue?

- A2. To ensure that nuclear power continues to be a safe, reliable resource for our nation's long-term energy supply and security, the United States must put in place a sustainable fuel cycle and used fuel management strategy. To advise the Administration, Secretary Chu convened the Blue Ribbon Commission on America's Nuclear Future (BRC). This expert panel completed their final report and recommendations in January of 2012. The Administration is giving full consideration to the BRC recommendations as we work to define a path forward. The Administration anticipated providing some additional information later this year, and will work with Congress to implement a new strategy to manage our nation's used nuclear fuel and nuclear waste.

QUESTION FROM CHAIRMAN RALPH HALL

Q3. Could a consolidated interim storage facility be developed as a private, NRC licensed facility? If so, how should DOE be directed to work with such a facility to assure its viability?

A3. Yes, under current law it could. The Private Fuel Storage facility in Utah was licensed by the Nuclear Regulatory Commission. In that case, the owner/applicant did not request assistance from DOE to assure its viability. It is not clear that there would need to be any involvement by DOE to ensure the viability of any private facility.

QUESTION FROM CHAIRMAN RALPH HALL

- Q4. Please describe the primary advantages and disadvantages associated with mined geological repositories compared to the deep borehole method of disposal.
- a. Please provide a detailed description of research, development, and demonstration needs associated with deep boreholes, and a list of corresponding activities that DOE intends to pursue in the current and next two fiscal years.
 - b. The Nuclear Waste Policy Act requires that high-level waste be retrievable after storage. Does the deep borehole method of disposal for nuclear waste meet that requirement? If not, do you think the Nuclear Waste Policy Act should be amended to permit permanent non-retrievable disposal.
- A4. The main difference between mined geological repositories and deep borehole disposal is that in a mined geological repository, waste is emplaced in a series of excavated drifts or rooms, characteristically a few hundred meters below the earth's surface. In the deep borehole disposal method, waste is emplaced in individual boreholes deep within the crystalline basement rock, typically between 3000 and 5000 meters below the earth's surface. There are potential advantages and disadvantages to both designs. Some of the primary advantages and disadvantages include:

The technology readiness level of mined geological repositories is currently much further advanced than the technology readiness level for deep borehole disposal. Disposal in deep boreholes has never been demonstrated, and there is no licensing experience with deep borehole disposal. Whereas, in the United States, the Waste Isolation Pilot Plant a geological repository in salt for defense transuranic waste has been in operation for years.

Internationally, most countries with radioactive waste disposal programs are pursuing some form of mined geological repository for disposal.

Mined geological repositories are more flexible than deep borehole disposal. Depending on the specific geologic media and repository design, mined repositories can accommodate a wider variety of waste types and larger size of waste packages. Due to current drilling technologies, waste packages disposed of in deep boreholes would be limited to about two feet in diameter. This would restrict the types of waste that could be disposed of in deep boreholes, or require some type of waste consolidation or waste processing to accommodate additional waste types. Mined repositories also lend themselves much better to retrievability of the wastes than deep borehole disposal.

Some potential advantages of deep borehole disposal are that the waste disposal depth provides a larger separation and potentially less interaction between the disposal zone and the surface environment and shallow groundwater. The deep borehole disposal concept is modular and could be deployed at multiple locations. Crystalline basement rock is relatively common at depths of 2 to 5 kilometers which could allow for geographical distribution of disposal sites if desired. Multiple disposal locations could reduce the distance of shipments and costs of transportation of wastes to the disposal sites. The difficulty of retrievability could also be considered a potential advantage for those wastes which have no possible future use, but could be a disadvantage if retrieval was warranted for protection of public health and safety, or the environment. Overall, the anticipated cost of deep borehole disposal is potentially less than that of a mined repository.

More detailed information on deep borehole disposal can be found in the *Reference Design and Operations for Deep Borehole Disposal of High-Level Radioactive Waste*, SANDIA REPORT SAND2011-6749, Arnold, B. W., P. V. Brady, et al. (2011).

- A4a. Deep borehole disposal is still in the conceptual stage. In FY12, the Department is preparing a Deep Borehole Research, Development & Demonstration Plan. Activities to be undertaken will be determined on an annual basis as part of the standard planning and budget development processes, the types of activities that could potentially be examined include:

Research activities designed to better understand the hydrogeochemical and geophysical state of deep crystalline rocks. Collaboration with industry partners on engineering analyses for site/surface operations, emplacement, seal design and the potential and cost of retrievability. Identification and development of characterization activities that are necessary to demonstrate the safety and meet regulatory requirements for the deep borehole disposal concept demonstration.

- A4b. Retrieval of waste disposed of in deep boreholes, although possible, would likely be very difficult. Although disposal in deep boreholes would likely be better suited to wastes that are not expected to have any potential value or use in the future, the option for retrieval would still need to be considered if necessary to protect public health and safety, or the environment. As to whether the NWPA should be amended to allow permanent non-retrievable disposal, that issue among many others would have to be considered as the

Administration develops its strategy and works with Congress to implement a new strategy to manage our nation's used nuclear fuel and nuclear waste. The Department is committed to collaborating with Congress and stakeholders to find a safe and long-term solution to managing our nation's used nuclear fuel.

QUESTION FROM CHAIRMAN RALPH HALL

- Q5. The transportation recommendations include several R&D components. How much funding does DOE anticipate will be needed to address R&D associated with transportation issues?
- a. Please provide a detailed description of research, development, and demonstration needs associated with transporting high-level radioactive waste, and a list of corresponding activities that DOE intends to pursue in the current and next two fiscal years.
- A5. The Department of Energy considers the activities related to transportation and storage to be closely related. Therefore the funding for these activities is grouped together. The R&D funding at national laboratories associated with the storage and transportation activities in FY12 is approximately \$8 million. This bundle of activities is funded at \$9 million in the FY13 Budget. Future activities and funding requirements will be determined through the standard program planning and budget development processes.

Some of the specific FY12 and FY13 activities at the national laboratories include:

- Initiate system analyses for including initial consolidated interim storage, use of standardized canisters, and improving efficiency of transportation.
- Conduct R&D on extended storage of used fuel including assessing issues related to the aging and safety of dry and wet storage and materials testing in support of modeling and simulation.
- Conduct R&D on transportation of used fuel following extended storage, particularly related to high burn up fuel.

In FY2012, in addition to the work at the national laboratories, the DOE is beginning work with private industry on issues related to transporting and storing used nuclear fuel.

Approximately \$12 million dollars is allocated, and includes the following activities:

- Materials Degradation - Work with the utilities to instrument storage casks to monitor and understand their behavior with time.
- Standardized Cask Systems – Analyses to examine tradeoffs associated with future implementation of standardized storage systems.

QUESTION FROM CHAIRMAN RALPH HALL

- Q6. The Department of Energy's FY 13 budget proposal requests \$10 million from the Nuclear Waste Fund to "support recommended activities, consistent with the Nuclear Waste Policy Act." Please provide a detailed description of how DOE intends to spend this requested funding.
- A6. Consistent with the Blue Ribbon Commission recommendation to promote the better integration of storage into the waste management system, including standardization of dry cask storage, DOE intends to utilize some of the requested \$10 million funding from the Nuclear Waste Fund to develop standardized container specifications with industry and award contracts to vendors to design standardized containers. The Nuclear Waste Fund could be used to fund any activities under titles I and II of the Nuclear Waste Policy Act that are needed to support DOE's commitment to meeting its obligation to dispose of used fuel and high-level radioactive waste.

DOE intends to utilize the remainder of the requested \$10 million from the Nuclear Waste Fund to finalize transportation procedures for technical assistance consistent with NWPA section 180 (c), will initiate pilot training programs for emergency responders along those routes from decommissioned sites if appropriate, and to expand interaction with Transportation Stakeholders consistent with Blue Ribbon Commission recommendations.

