MAINE STATE LEGISLATURE

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November 5, 2012

MEMORANDUM

TO: Senator Kevin Raye, President of the Senate, and Representative Robert Nutting, Speaker of the House

FROM: Mary Mayhew, Commissioner
Department of Health and Human Services

SUBJECT: State Nuclear Safety Inspector's June 2012 Monthly Report to the Legislature on the Interim Spent Fuel Storage Facility in Wiscasset, Maine

Legislation enacted in the spring of 2008 requires the State Nuclear Safety Inspector to provide monthly reports to the President of the Senate, Speaker of the House, the U.S. Nuclear Regulatory Commission, and Maine Yankee. The report focuses on activities at the site and includes highlights of the national debate on storing and disposing the used nuclear fuel. For your convenience highlights of national events are included as a preface to the report.

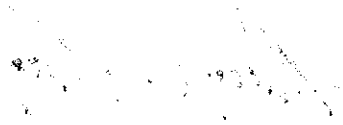
The enclosed report provides the information required under Title 22 of the Maine Revised Statutes Annotated §666, as enacted under Public Law, Chapter 539, in the second regular session of the 123rd Legislature.

Should you have questions about its content, please feel free to contact Mr. Patrick J. Dostie, State Nuclear Safety Inspector, at 287-6721.

pjd

Enclosures

cc: Mark Lombard, U.S. Nuclear Regulatory Commission
Monica Orendi, U.S. Nuclear Regulatory Commission, Region I
James Connell, Site Vice President, Maine Yankee
Katrin Teel, Senior Policy Advisor, Governor's Office
Sheila Pinette, DO, Director, Maine Center for Disease Control and Prevention
Patricia W. Aho, Commissioner, Department of Environmental Protection
Richard Davies, Maine Public Advocate
Lieutenant Anna Love, Special Services Unit, Maine State Police
Nancy Beardsley, Director, Division of Environmental Health
Jay Hyland, PE, Manager, Radiation Control Program



State Nuclear Safety Inspector Office
Maine CDC – DHHS

June 2012 Monthly Report to the Legislature

Executive Summary

As part of the State's long standing oversight of Maine Yankee's nuclear activities, legislation was enacted in the second regular session of the 123rd and signed by Governor John Baldacci requiring that the State Nuclear Safety Inspector prepare a monthly report on the oversight activities performed at the Maine Yankee Independent Spent Fuel Storage Installation facility located in Wiscasset, Maine.

The report covers activities at the storage facility, including the State's on-going environmental radiation surveillance and the national debate over the licensing and construction of a geologic repository for the disposal of spent nuclear fuel at Yucca Mountain in Nevada. The report's highlights assist readers to focus on the significant activities that took place during the month, both locally and nationally.

LOCAL:

- The Nuclear Regulatory Commission (NRC) issued a Confirmatory Order to Maine Yankee immediately modifying their license to incorporate Maine Yankee's Negation Action Plan as part of their license. In January of this year the NRC issued a notice of violation to Maine Yankee citing them for a violation of the foreign ownership, control and domination provision of the Atomic Energy Act as amended. Maine Yankee disagreed but adopted a Board of Directors Resolution implementing a Negation Action Plan that prevented "any potential for foreign control over safety and security matters". Although Maine Yankee's voluntarily complied, the NRC determined that a modification to Maine Yankee's license was necessary to maintain the Negation Action Plan in place and that no changes can be made to the Plan without the NRC's prior written consent.
- The Nuclear Regulatory Commission's Region I issued its inspection report of Maine Yankee's Independent Spent Fuel Storage Facility from its June 6th inspection. The report focused on the adequacy of the radiation protection, fire protection, emergency planning preparedness, surveillance, maintenance, environmental monitoring, training, quality assurance and corrective action programs. According to the report there were no findings of significance. The June 6th inspection also included a security inspection of Maine Yankee's storage facility. Two issues were raised during the inspection and these were still under NRC deliberation at the time of the issuance of this report. A report on the security inspection is expected in July.
- Maine Yankee submitted a request for exemption from specific requirements to the Nuclear Regulatory Commission's Part 50 regulations. In November of 2011 the NRC issued a final rule to their "Enhancements to Emergency Preparedness Regulations". The final rule described six security related and six non-security related emergency planning issues. The final rule applies to nuclear power reactor licensees with some applicability to non-power reactor licensees. Although Maine Yankee still holds a Part 50 license, the Part 50 definitions for both nuclear power and non-power reactor do not include such licensees as Maine Yankee who have permanently ceased operations and maintain only an independent storage facility. Maine Yankee provided an Environmental Assessment for its exemption request and

supplied its justifications for each of the six security related and four of the non-security related emergency planning requirements.

- Governor LePage sent a letter to Maine's Congressional delegation imploring them to "act expeditiously to engage the Congressional Leadership" and "to implement the priority recommendations of the BRC (Blue Ribbon Commission), including (1) immediate access to the funds nuclear utility ratepayers are providing for the purpose of nuclear waste management; and (2) prompt efforts to develop one or more consolidated storage facilities".

The national highlights primarily focused on federal court actions and Congressional activities as noted below:

National:

- The U.S. Court of Appeals rendered their decision on the lawsuit brought on by the National Association of Regulatory Utility Commissioners (NARUC) against the Department of Energy (DOE) over the Nuclear Waste Fund fee maintained by DOE. NARUC contended that the November 2010 fee determination performed by the Secretary of Energy claiming that there was no basis for suspending or adjusting annual fees collected from nuclear utilities totaling $750 million a year besides interest after the DOE terminated the Yucca Mountain Project was invalid and the fees should be suspended. The Court agreed with the petitioner and concluded that the Secretary failed to perform a valid evaluation, but did not order the suspension of the fee. Instead, the Court directed the Secretary to comply with the Nuclear Waste Policy Act and render an appropriate fee determination within six months. The Court acknowledged that the DOE is prone to delays and, therefore, retained jurisdiction over the case.
- The U.S. House of Representatives passed an amendment to their FY 2013 Appropriations Act to provide an extra $10 million in funds to the Nuclear Regulatory Commission to complete its review of the Yucca Mountain license application. The amendment received broad bipartisan support and passed with a vote of 326 to 81. Representative Michael Michaud voted in favor of the measure whereas Representative Chellie Pingree did not.
- The U.S. Court of Appeals for the District of Columbia Circuit issued its decision that the Nuclear Regulatory Commission failed its obligations under the National Environmental Policy Act by not performing a more thorough analysis than what its Waste Confidence Decision Update provided. The Court noted that the Commission did not evaluate the long term consequences of storing spent fuel if a repository was never built as opposed to the Commission's position in its Waste Confidence Update wishing that one will be available when needed. On the same day the Court also Ordered that the Clerk withhold the issuance of the Court Order pending any petition for rehearing.

Introduction

As part of the Department of Health and Human Services' responsibility under Title 22, Maine Revised Statutes Annotated (MRSA) §666 (2), as enacted under Public Law, Chapter 539 in the second regular session of the 123rd Legislature, the foregoing is the monthly report from the State Nuclear Safety Inspector.

The State Inspector's individual activities for the past month are highlighted under certain broad categories, as illustrated below. Since some activities are periodic and on-going, there may be some months when very little will be reported under that category. It is recommended for reviewers to examine previous reports to ensure connectivity with the information presented as it would be cumbersome to continuously repeat prior information in every report. Past reports are available from the Radiation Control Program's web site at the following link: www.maineradiationcontrol.org and by clicking on the nuclear safety link in the left hand margin.

Commencing with the January 2010 report the glossary and the historical perspective addendum are no longer included in the report. Instead, this information is available at the Radiation Control Program's website noted above. In some situations the footnotes may include some basic information and may redirect the reviewer to the website.

Independent Spent Fuel Storage Installation (ISFSI)

During June the general status of the ISFSI was normal, with no instances of spurious alarms due to environmental conditions.

There was one fire-related impairment for the month and it was a carry over from the previous month's Fire Door issue. A contractor was called in and repairs were performed on the door. The unit tested satisfactorily and was returned to service on June 19th.

There were two security-related impairments for the month. The first occurred on June 14th and involved a bad connection to a camera. The problem was corrected in less than a day. The second one occurred on June 26th and involved 4 security events logged for scheduled maintenance on the fence replacement project and associated paving.

There were twenty-four security events logged with nineteen attributable to transient camera issues due to environmental conditions with the remaining five related to the security impairments discussed above.

There were twenty-six condition reports[1] (CR) for the month of June and they are described below.

1st CR: Was written to document improper controls implemented on the 345 kV switchyard reliability project. Work was temporarily halted until the required sampling was performed.

2nd CR: Documented the failure of a padlock on a cabinet. The padlock was replaced with a security-grade padlock.

3rd CR: Was written to document the moving of an ammunition cabinet within fifteen feet of a flammable locker. The cabinet was moved immediately upon discovery.

4th CR: Documented the improper installation of a ceiling tile in lieu of a smoke detector mounted in a ceiling tile. The issue was discovered during smoke detector testing and was corrected immediately.

[1] A condition report is a report that promptly alerts management to potential conditions that may be adverse to quality or safety. For more information, refer to the glossary on the Radiation Program's website.

5th CR: Documented the improper sealing of a fire barrier penetration. The issue was corrected immediately.
6th – 14th CRs: Documented several discrepancies noted during the biennial audit of the QA program. The findings were lumped into nine general areas for tracking purposes.
15th CR: Documented problems with a computer server. The server was replaced with a backup server.
16th CR: Was written to document the inconsistent use of a procedure. The procedure was revised.
17th CR: Was written to document the improper completion of a form. The issue was corrected immediately.
18th CR: Documented the discovery of discrepancies in the Audit Report. The Audit Report was immediately corrected and reissued as Rev 1.
19th CR: Documented the failure of a camera.
20th CR: Documented the premature distribution of a revised procedure prior to its controlled distribution.
21st CR: Documented the use of an incorrect revision of a procedure form. The issue was corrected immediately.
22nd CR: Was written to document damage to the pavement during the fencing project.
23rd CR: Documented to ensure that all self-assessment recommendations and observations are tracked to closure.
24th CR: Documented the retraining and assessment of an individual after identified personnel performance issues.
25th CR: Was written to document the failure of a radiation device. New radiation equipment was issued after a radiation assessment was performed.
26th CR: Documented the damage to an aluminum railing caused by a man-lift. The railing will be repaired.

Other ISFSI Related Activities

1. On June 4th the Nuclear Regulatory Commission (NRC) issued a Confirmatory Order to Maine Yankee immediately modifying their license to incorporate Maine Yankee's Negation Action Plan as part of their license. In January of this year the NRC cited Maine Yankee for violating the foreign ownership, control and domination provision of the Atomic Energy Act as amended. Maine Yankee disagreed but adopted a Board of Directors Resolution implementing a Negation Action Plan that prevented "any potential for foreign control over safety and security matters". Although Maine Yankee voluntarily complied, the NRC determined that a modification to Maine Yankee's license was necessary to maintain the Negation Action Plan in place and that no changes can be made to the Plan without the NRC's prior written consent. On June 6th the Nuclear Regulatory Commission issued a press release explaining its position on the Confirmatory Order. A copy of the press release is attached.

2. On June 6th two NRC Inspectors from Region I inspected Maine Yankee's storage facility in Wiscasset. One Inspector focused on security issues while the other concentrated on safety programs at the facility, such as radiation control, fire protection, emergency planning, quality assurance, etc. The State Inspector participated in the federal inspection and observed some security demonstrations. At the exit briefing the safety programs did not have any findings. However, on the security side, the inspector raised two issues that may require further NRC management involvement. The first involved a safeguards issue and therefore not available for public disclosure. The second included the inadequate compensatory measures instituted during a snowstorm, which was identified by Maine Yankee and later reported to the NRC in a licensee event report.

3. On June 8th Maine Yankee submitted a request for exemption from specific requirements to the Nuclear Regulatory Commission's Part 50 regulations. In November of 2011 the NRC issued a final rule to their "Enhancements to Emergency Preparedness Regulations". The final rule described six security related

and six non-security related emergency planning issues. The final rule applies to nuclear power reactor licensees with some applicability to non-power reactor licensees. Although Maine Yankee still holds a Part 50 license, the Part 50 definitions for both nuclear power and non-power reactor do not include such licensees as Maine Yankee who have permanently ceased operations and maintain only an independent storage facility. Maine Yankee provided an Environmental Assessment for its exemption request and supplied its justifications for each of the six security related and four of the non-security related emergency planning requirements.

4. On June 18th Maine Yankee submitted a letter to the Nuclear Regulatory Commission on the NRC's advance notice of proposed rulemaking for onsite emergency response capabilities. In the letter Maine Yankee maintained that the proposed rulemaking does not apply to its storage facility and requested that the NRC include specific language in the rulemaking stating that it does not apply to Part 50 licensees that are restricted to the storage of used nuclear fuel.

5. On June 28th the Nuclear Regulatory Commission, Region I issued its inspection report of Maine Yankee's Independent Spent Fuel Storage Facility from its June 6th inspection. The report focused on the adequacy of the radiation protection, fire protection, emergency planning preparedness, surveillance, maintenance, environmental monitoring, training, quality assurance and corrective action programs. There were no findings of significance.

Environmental

The State received its third quarter thermo-luminescent dosimeters[2] (TLDs). Of the seven controls received three were returned immediately to the vendor, Global Dosimetry in California, to assist the State in assessing the amount of radiation exposure the field devices pickup from background radiation in travelling from California to Maine and their return to California for processing. The third quarter badges will be placed in the field in early July.

Other Newsworthy Items

1. On June 1st the U.S. Court of Appeals rendered their decision on the lawsuit brought on by the National Association of Regulatory Utility Commissioners (NARUC) against the Department of Energy (DOE) over the Nuclear Waste Fund fee maintained by DOE for managing the nation's nuclear waste. NARUC contended that the November 2010 fee determination performed by the Secretary of Energy claiming that there was no basis for suspending or adjusting annual fees collected from nuclear utilities totaling $750 million a year, not including interest, especially after the DOE terminated the Yucca Mountain Project, was invalid and the fees should be suspended. The Court agreed with the petitioner and concluded that the Secretary failed to perform a valid evaluation, but did not order the suspension of the fee. Instead, the Court directed the Secretary to comply with the Nuclear Waste Policy Act and render an appropriate fee determination within six months. The Court acknowledged that the DOE is prone to delays and, therefore, retained jurisdiction over the case. A copy of the Court decision is attached.

2. On June 1st the Chair of the Pennsylvania Public Utility Commission sent a memorandum to the Pennsylvania Congressional delegation advocating for the support of the amendment to increase the funding to the Nuclear Regulatory Commission from $25 million to $35 million to finish the licensing review of the Yucca Mountain application. A copy of the memorandum is attached.

[2] Thermoluminescent Dosimeters (TLD) are very small, passive radiation monitors requiring laboratory analysis. For a further explanation, refer to the glossary on the Radiation Program's website.

3. On June 4th a resolution was introduced in the Pennsylvania House for Congress to adopt legislation to construct consolidated interim storage facilities, to recognize communities willing to host such facilities, to ensure access to the Nuclear Waste Fund, and to permit privately owned and licensed storage facilities to meet the public need. The resolution would be transmitted to the President, the presiding officers of each house of Congress, and the Pennsylvania congressional delegation. On June 27th the House passed the resolution unanimously (199 to 0). A copy of the resolution is attached.

4. On June 4th the Congressional Research Service issued a report, entitled "Closing Yucca Mountain: Litigation Associated with Attempts to Abandon the Planned Nuclear Waste Repository". The document provided a historical perspective on the actions that have led to the present ongoing dispute over the attempted termination of the Yucca Mountain program. The report discussed the Obama Administration's Budget for the last three fiscal years (FY2011 through FY2013), the Blue Ribbon Commission's formation and final recommendations, the attempted withdrawal of the Yucca Mountain Construction Authorization License Application by the Department of Energy (DOE), the Chairman of the Nuclear Regulatory Commission (NRC) halting of the license review due to budgetary guidance and the Commission's eventual suspension of the licensing proceedings, the U.S. Court of Appeals litigation with the DOE and the NRC, and finally Congressional reaction to the proposed termination of the Yucca Mountain project. In some instances the report provided legal arguments, both pro and con, for some of the historical events. The report concluded that the "Yucca Mountain dispute will not only unfold legally before the NRC and in the D.C. Circuit, but also politically in the form of likely appropriations disputes, investigations, and oversight hearings".

5. On June 6th the U.S. House of Representatives passed an amendment to their FY 2013 Appropriations Act to provide an extra $10 million in funds to the Nuclear Regulatory Commission to complete its review of the Yucca Mountain license application. The amendment received broad bipartisan support and passed with a vote of 326 to 81. Representative Michael Michaud voted in favor of the measure whereas Representative Chellie Pingree did not. A copy of the press release is attached.

6. On June 7th the National Association of Regulatory Utility Commissioners filed a motion with the U.S. Court of Appeals for the D.C. Circuit to vacate its six month Order to the Department of Energy to comply with the Nuclear Waste Policy Act by providing a revised fee determination and requested that the mandate for fee suspension be issued immediately. The petitioner raised concerns that the DOE may seek further delays and not meet the six month deadline imposed by the Court and add further delays to its fee determination.

7. On June 7th the President of the National Association of Regulatory Utility Commissioners testified before the Senate Committee on Environment and Public Works' Subcommittee on Clean Air and Nuclear Safety. He expressed the Association's frustration with the federal government's handling of spent nuclear fuel and high level radioactive waste. He did praise the Blue Ribbon Commission's recommendation to change the nuclear waste funding and noted that the consent based approach is critical to the future success of any new nuclear waste policy. A copy of the release is attached.

8. On June 7th the Senate Environment and Public Works Subcommittee on Clean Air and Nuclear Safety held a hearing on recommendations for siting of nuclear waste storage facilities. The Senators heard from two panels, the first from two members of the Blue Ribbon Commission and the second from five stakeholders from government agencies, nuclear industry and research labs. The industry panel member was Eric Howes, Director of Government and Public Affairs for Maine Yankee. Mr. Howes appeared on behalf of the three Yankee companies (Maine Yankee,

Connecticut Yankee and Yankee Atomic). He commended the Blue Ribbon Commission's report and its recommendations and endorsed those that directly affect the decommissioned sites, such as:

- "A voluntary, incentive-based siting program that would lead to the licensing of a consolidated interim storage facility,
- A 'first in line' priority for the movement of spent fuel stored at shutdown reactor sites to a licensed storage facility, and
- The initiation of programs to coordinate federal, state and local efforts for the transportation of the used nuclear fuel to consolidated storage and disposal sites."

Mr. Howes concluded his testimony by listing twelve nationally recognized organizations that support the 'first in line' concept for decommissioned sites.

9. On June 8th the U.S. Court of Appeals for the District of Columbia Circuit issued its decision that the Nuclear Regulatory Commission failed its obligations under the National Environmental Policy Act by not performing a more thorough analysis than what its Waste Confidence Decision Update provided. The Court noted that the Commission did not evaluate the long term consequences of storing spent fuel if a repository was never built as opposed to the Commission's position in its Waste Confidence Update wishing that one will be available when needed. In addition, the Court further decreed that the Commission failed to properly examine the future risks of leaks from spent fuel pools and the potential consequences of pool fires. On the same day the Court also Ordered that the Clerk withhold the issuance of the Court Order pending any petition for rehearing. Copies of the Court's Orders and decision are attached.

10. On June 8th the Chair of the Nye County Board of County Commissioners sent a letter to Nevada's congressional delegation taking exception to a letter they received from the Chair of the Nevada Commission on Nuclear Projects that had circulated an article from a technical advisor to the State of Nevada that "(1) 'refutes the argument, repeatedly advanced by Yucca Mountain proponents, that Nevada's opposition is based purely on politics and irrational fears'; (2) argues 'that no other repository program in the world is developing a site with the unfavorable conditions present at Yucca Mountain'; and (3) concludes that 'Yucca Mountain is an unsuitable and unsafe site". The letter included a critique of the State's technical advisor. Copies of the letter and, for completeness, both the Nye County's rebuttal and the original technical advisor's article are attached.

11. On June 13th an international review team, commissioned by the Swedish Government, reviewed the Swedish Nuclear Fuel and Waste Management Company's application to build a final repository for spent nuclear fuel at Fosmark. The international team concluded that the company's analysis met all the safety requirements for the licensing process. The team, which has been reviewing the application for over a year, also pointed out additional opportunities for research to further strengthen the confidence in the findings of the safety analysis.

12. On June 14th the Nuclear Waste Strategy Coalition held its biweekly conference call to update its membership of upcoming congressional appropriation bills in both the House and Senate, and the three lawsuits before the Appeals Court on the mandamus case to compel the Nuclear Regulatory Commission (NRC) to resume its licensing proceedings on the Yucca Mountain project, the fee suspension case due to a lack of a nuclear waste disposal program in the Department of Energy, and the impact of the Court's ruling to vacate the Nuclear Regulatory Commission's waste confidence update on current and future licensing and relicensing efforts. As expected the House increased the funding to their appropriation bill to resume the NRC's licensing proceedings on Yucca Mountain. The Senate's appropriations version did not include any funding for Yucca Mountain but did have a provision to establish a pilot program to site, construct and operate consolidated interim storage

facilities. In addition, the Senate introduced on June 10th draft legislation for a comprehensive nuclear waste management bill that would address the Blue Ribbon Commission's recommendations. The confirmation hearing for the appointment of two NRC Commissioners was held the previous day. Both Commissioners were nominated by the President. One Commissioner was re-nominated after serving one term and the other was nominated to replace the outgoing Chairman who had resigned. Although oral arguments were heard on May 2nd for the mandamus case, a ruling was not expected until this fall.

13. On June 19th the State Inspector participated in a webinar on nuclear safety in the Northeast. The webinar was sponsored by the Northeast High-Level Radioactive Waste Transportation Task Project, a subsidiary of The Council of State Government's Eastern Regional Conference (CSG-ERC). With some states in the Northeast grappling with nuclear safety and relicensing of older plants and the concerns following the Fukushima disaster, the webinar speakers spoke of the future of nuclear power in light of safety, cost and climate change and its impact on the Northeast. The speakers were Dr. Andrew Kadak, professor at Massachusetts Institute of Technology, and David Lochbaum, Director of the nuclear safety program at the Union of Concerned Scientists. Dr. Kadak explained what happened at the Fukushima reactors, how US reactors are better prepared because of previous upgrades due to the Three Mile Island accident and the 9/11 terrorist attacks, and the Nuclear Regulatory Commission's (NRC) and the nuclear industry's lessons learned and response to the Fukushima tragedy. Mr. Lochbaum expressed how Northeast reactors were vulnerable to extended loss of power but less so due to post 9/11 upgrades, the lessons learned from Fukushima should be implemented as quickly as possible, presented the status of the 24 operating and nine shutdown reactors in the Northeast, which of the 21 operating reactors were leaking radioactive material to the groundwater and which five did not meet the NRC's fire protection regulations, which 13 operating reactors stored too much spent fuel in elevated pools, how the Brookhaven National Laboratory study assessed the consequences of a spent fuel pool mishap, and recommended moving all spent fuel, after five to six years of cooling, to dry cask storage. The webinar was moderated by Maine Representative Jon Hinck, Ranking Minority Member of the Joint Standing Committee on Energy, Utilities and Technology, and presently Vice-Chair of the CSG-ERC's Energy and Environment Committee.

14. On June 20th the quarterly conference call of the Federal Energy Regulatory Commission rate case settlement briefing took place with representatives from the states of Connecticut, Maine and Massachusetts. The briefing provided the status of the two nuclear waste lawsuits against the federal government. The Phase I lawsuit, which awarded Maine Yankee about $81 million, was upheld by the Federal Court of Appeals and increased Massachusetts' Yankee Rowe's award by another $17 million. However, the expectation is that the government will continue to delay paying the claim. In a separate federal appeals case involving Pacific Gas and Electric, the Court ruled that waste classified as Greater Than Class C will be shipped to the same geological repository that spent fuel is moved to. The Phase II lawsuit went to trial in October of 2011 and the Judge allowed a limited window for the Department of Justice to reopen the records. Further briefs were scheduled for this year and a favorable decision is expected before the end of the year. Other updates were provided on national activities, such as the Blue Ribbon Commission's (BRC) recommendations and Congressional efforts to move those recommendations forward. The Department of Energy was identifying near and mid term actions it could take to implement the recommendations, including some consideration to conduct some survey work of the rail infrastructure in New England by early fall. In addition, the Senate appeared to be more receptive than the House to implement the BRC's recommendations. The Senate Appropriations Committee agreed with Maine Yankee's Citizens Advisory Panel Chairperson, Marge Kilkelly, who suggested flexibility when it came to defining consent-based approach to allow it to emerge since everyone would have their own definition of what consent based meant. The State of Connecticut briefed the group on its involvement in the

lawsuit against the Nuclear Regulatory Commission's (NRC) Waste Confidence Update Ruling and the application of the National Environmental Policy Act. Connecticut stated that the NRC did not consider many of the forward looking aspects of the long term storage of spent fuel. The Court's decision vacated the NRC's Waste Confidence Update and remanded it back to the NRC to perform an environmental assessment (EA) or impact statement (EIS). Connecticut did not think this was an insurmountable task as the NRC had most of the information available to perform an EA or EIS. However, until the NRC issued the EA or EIS, upcoming licensing actions, such as the relicensing of Indian Point, were questionable. Senators Snowe's and Collins' letter to the Energy Secretary was mentioned as it recommended the Department of Energy to expeditiously address the BRC's recommendations on decommissioned reactor sites. Regionally, the three Yankee companies may conduct a security response exercise with all three sites participating. Other updates were provided on the efforts of the Nuclear Waste Strategy Coalition and Nuclear Energy Institute, the Council of State Governments, and the National Association of Regulatory Utility Commissioners.

15. On June 21st the National Council of State Legislatures sent a letter to the Senate Majority and Minority Leaders urging them to support the Senate Appropriations Bill that would "create a pilot program within the Department of Energy to license, construct, and operate consolidated interim storage facilities" for used nuclear fuel. The letter also exhorted the use of the consent based approach for siting such facilities at all levels of government. A copy of the letter is attached.

16. On June 21st the Department of Energy filed with the U.S. Court of Appeals for the D.C. Circuit its response to the National Association of Regulatory Utility Commissioners' June 7th motion to expedite the mandate on the Nuclear Waste Fund fee determination. The respondents requested that the motion be denied on the grounds that the June 7th motion violated the Federal Rules of Appellate Procedure.

17. On June 22nd the Department of Justice file its amicus curiae (friend of the court) with the U.S. Court of Appeals for the D.C. Circuit as Ordered by the Court of Appeals in its May 2nd deliberation of the case against the Nuclear Regulatory Commission's cessation of the Yucca Mountain project and the Court's May 21st Order granting the Justice Department a 21 day extension in responding to its May 2nd Order. The Justice Department argued that the case against the NRC should be denied based on the petitioners lack of standing in the case, limited funding available for the NRC as well as the Department of Energy, and general appropriations cannot be used to fund the Yucca Mountain licensing proceedings unless specifically directed to do so by Congress.

18. On June 25th the Nuclear Waste Repository Project Office of Nye County, Nevada commented on the Nuclear Regulatory Commission's (NRC) May 2012 report, entitled" Identification and Prioritization of the Technical Informational Needs Affecting Potential Regulation of Extended Storage and Transportation of Spent Nuclear Fuel". The letter expressed agreement with the recent Court decision that vacated the NRC's Waste Confidence Update, raised the issue of repackaging and retrievability of spent nuclear fuel since the current storage technology is predicated on Yucca Mountain as the repository, and suggested the necessity for technical, cost and impact studies on extended storage and repackaging to include worker exposure and disposal of used containers. The letter listed nine specific comments on the NRC report. A copy of the letter is attached.

19. On June 27th the Nuclear Waste Strategy Coalition (NWSC) held its second biweekly conference call to update its membership of upcoming congressional appropriation bills in both the House and Senate, and the status of the three litigations before the Appeals Court on the mandamus case, the fee suspension case and the waste confidence case. Both individuals nominated by the President to be Nuclear Regulatory Commissioners were approved by the Senate Committee. A vote in the full Senate ratifying their nomination was expected before the end of the month. The Senate's draft

legislation, titled the "Nuclear Waste Administration Act of 2012", was floated by Senators Feinstein, Bingaman, Alexander and Murkowski to implement the Blue Ribbon Commission's (BRC) recommendations. Instead of adopting one of the key BRC recommendations to create a federal corporation like the Tennessee Valley Authority to manage the nation's nuclear waste, the draft legislation created another federal agency. Concerns were immediately raised that the establishment of another federal agency would engender the same problems that plagued the Department of Energy in its administration of the nation's nuclear waste program, namely budget requests not fully funded, diversion of funds to balance the budget, and constantly prone to politics and political pressures. These were the justifications that the Blue Ribbon Commission had used to recommend a federal corporation as a different direction for the nation to manage its nuclear waste program. The NWSC is an ad hoc organization of state utility regulators, state attorneys general, consumer advocates, electric utilities and associate members, that includes 40 organizations in more than 30 states. Its primary focus is to protect ratepayer payments into the Nuclear Waste Fund and to support the removal and ultimate disposal of spent nuclear fuel and high-level radioactive waste currently stranded at some 125 commercial, defense, research, and decommissioned sites in 39 states.

20. On June 28th Governor LePage sent a letter to Maine's Congressional delegation imploring them to "act expeditiously to engage the Congressional Leadership" and "to implement the priority recommendations of the BRC (Blue Ribbon Commission), including (1) immediate access to the funds nuclear utility ratepayers are providing for the purpose of nuclear waste management; and (2) prompt efforts to develop one or more consolidated storage facilities". A copy of the letter is attached.

21. On June 29th, in compliance with the D.C. Circuit Court of Appeals May 21st Order, the Nuclear Regulatory Commission responded to the Department of Justice's amicus curiae brief. The NRC agreed with the Justice's position on all its major contentions as to why the writ of mandamus sought by the petitioners should be denied.

22. On June 29th the U.S. Senate confirmed both presidential nominees to the Nuclear Regulatory Commission (NRC). Dr. Allison Macfarlane was confirmed for a year as the new Chair of the NRC. Kristine Svinicki was re-confirmed to a five year, second term on the Commission.

23. On June 29th the Nuclear Energy Institute (NEI) sent a letter to the Nuclear Regulatory Commission (NRC) commenting on its May 2012 report, entitled" Identification and Prioritization of the Technical Informational Needs Affecting Potential Regulation of Extended Storage and Transportation Of Spent Nuclear Fuel". Although the letter commented on the various parties producing similar efforts to the NRC, such as the Energy Department and the Electric Power Research Institute, the letter promoted three noteworthy areas for furthering the development of the technical basis for extended storage. They are NRC's methodology for identifying and prioritizing potential technical information needs, NRC's approach to identifying potential technical information needs, and the regulatory significance and potential impact on safety as key considerations for further research. While the NEI lauded these areas, it also provided further clarifications to enhance the process. Copies of the letter and comments are attached.

24. On June 29th the Nevada Agency for Nuclear Projects sent a letter to the Nuclear Regulatory Commission requesting an extension to the 60 day comment period published in the Federal Register. The request was based on the size and complexity of the report, the requirement to contract for outside expertise on some of the specific technical issues and assumptions, and research into why recent NRC studies on transportation were not included in the report's bibliography. A copy of the letter is attached.

NRC NEWS

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No. 12-068 June 6, 2012

NRC ISSUES CONFIRMATORY ORDERS TO MAINE YANKEE, CONNECTICUT YANKEE AND YANKEE ROWE ON FOREIGN OWNERSHIP ISSUES

The Nuclear Regulatory Commission has issued Confirmatory Orders to Connecticut Yankee Atomic Power Co., Yankee Atomic Electric Co., and Maine Yankee Atomic Power to incorporate plans into their licenses to negate the effects of foreign ownership of their companies.

In April 2011, while reviewing an indirect license transfer request involving the merger of Northeast Utilities (NU) and NSTAR, NRC staff discovered that the three Yankee companies – subsidiaries of NSTAR and NU – had significant foreign ownership. The previous changes in ownership occurred incrementally over time through transactions that did not affect the NRC licenses or require NRC approval.

The companies hold licenses under 10 CFR Part 50 for decommissioned nuclear power plants that maintain onsite spent nuclear fuel storage facilities. Because the licenses are under Part 50, they are subject to NRC restrictions on foreign ownership, control and domination of nuclear power facilities. Those former nuclear plants were Connecticut Yankee in Haddam Neck, Conn., Yankee Rowe in Rowe, Mass. (operated by Yankee Atomic Power Co.), and Maine Yankee in Wiscasset, Maine.

The NRC review of the NU/NSTAR merger found that three foreign corporations – Iberdrola of Spain, National Grid of the United Kingdom, and Emera of Canada – share ownership interests through their subsidiaries in the Yankee companies. The combined foreign ownership interest is 74 percent of Maine Yankee, 25.5 percent of Connecticut Yankee, and 44 percent of Yankee Atomic, with the largest percentage of ownership of one foreign corporation being Iberdrola owning 38 percent of Maine Yankee.

NRC issued separate violations to the Yankee companies in January, citing them for non-compliance with the foreign ownership and control regulations. The violations were severity level IV, the least serious level. There have been no safety or security consequences identified. The Confirmatory Orders were issued June 5.

The negation action plans implemented by the companies intend to ensure that the partial foreign ownership of the companies does not lead to foreign control, domination or influence over the companies' decision-making on matters relating to public health and safety, security, or access to classified information.

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United States Court of Appeals

FOR THE DISTRICT OF COLUMBIA CIRCUIT

Argued April 20, 2012 Decided June 1, 2012

No. 11-1066

NATIONAL ASSOCIATION OF REGULATORY UTILITY COMMISSIONERS,
PETITIONER

v.

UNITED STATES DEPARTMENT OF ENERGY,
RESPONDENT

Consolidated with 11-1068

On Petitions for Review
of Final Actions of the Department of Energy

Jay E. Silberg argued the cause for petitioners. With him on the briefs were *Timothy J.V. Walsh*, *James Bradford Ramsay*, and *Anne W. Cottingham*. *Michael A. Bauser* entered an appearance.

Joseph A. McGlothlin and *Richard C. Bellak* were on the brief for *amici curiae* Florida Public Service Commission, et al. in support of petitioners. *Cynthia B. Miller* entered an appearance.

Harold D. Lester Jr., Assistant Director, U.S. Department of Justice, argued the cause for respondent. With him on the brief were *Tony West*, Assistant Attorney General, and *Jeanne E. Davidson*, Director.

Before: SENTELLE, *Chief Judge*, BROWN, *Circuit Judge*, and SILBERMAN, *Senior Circuit Judge*.

Opinion for the Court filed by *Senior Circuit Judge* SILBERMAN.

SILBERMAN, *Senior Circuit Judge*: Petitioners, nuclear power plant owners and operators, ask us to review a November 2010 determination by the Secretary of Energy finding that there was no basis for suspending, or otherwise adjusting, annual fees collected from them totaling some $750 million a year. Those fees are intended to cover the full costs of the government's long-term disposal of civilian nuclear waste. But the Administration has discontinued development of Yucca Mountain, which was the designated location for the disposal of the waste. According to petitioners, the Secretary's 2010 determination, made subsequent to that decision, failed to examine (or even mention) the anticipated costs of disposal, or compare them to expected revenues from the fees (and associated interest and investment income). The Secretary's determination is claimed, thereby, to have violated the 1982 Nuclear Waste Policy Act ("the Act"), which obliges the Secretary to annually "evaluate whether collection of the fee will provide sufficient revenues" to offset program costs. In the absence of such evaluation, it is argued, the determination was invalid, and because no future program has replaced Yucca Mountain, petitioners contend that the Secretary is obliged to suspend the fees and report his action to Congress.

We conclude that the Secretary has failed to perform a valid evaluation, as he is obliged to do under the Act, but we do not think it appropriate to order the suspension of the fee at this time. Instead, we remand to the Secretary with directions to comply with the statute within six months. The panel will retain jurisdiction over this case so that any further review would be expedited.[1]

I.

The Act made the federal government responsible for permanently disposing of spent nuclear fuel and high-level radioactive waste produced by civilian nuclear power generation and defense activities. It provided that the government would do so through geologic disposal, which involves constructing a repository deep underground within a rock formation where the waste would be placed, permanently stored, and isolated from human contact. The Department of Energy was required to begin disposal by January 31, 1998. Since 1987, when the Act was amended, the Department has been directed to consider the

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[1]We also remind the parties that our Handbook of Practice and Internal Procedures states that "parties are strongly urged to limit the use of acronyms" and "should avoid using acronyms that are not widely known." Brief-writing, no less than "written English, is full of bad habits which spread by imitation and which can be avoided if one is willing to take the necessary trouble." George Orwell, "Politics and the English Language," 13 Horizon 76 (1946). Here, both parties abandoned any attempt to write in plain English, instead abbreviating every conceivable agency and statute involved, familiar or not, and littering their briefs with references to "SNF," "HLW," "NWF," "NWPA," and "BRC" – shorthand for "spent nuclear fuel," "high-level radioactive waste," the "Nuclear Waste Fund," the "Nuclear Waste Policy Act," and the "Blue Ribbon Commission."

suitability of one site only – Yucca Mountain, Nevada – for the repository.[2]

Congress's best-laid plans have been frustrated. In 1995, the Department announced that it would be unable to meet the 1998 deadline; the earliest conceivable date for disposal was 2010.[3] In early 2009, the Department said that construction at Yucca Mountain would not begin until at least 2011, and that transportation and disposal of waste would not occur until 2020. Only a few months later the new Administration announced, in an abrupt volte face, that Yucca Mountain "was not a workable option." Instead, it established a Blue Ribbon Commission to reconsider "all alternatives" for permanently disposing of nuclear waste. But the Commission's 2011 Draft Report conceded that geologic disposal was really the only viable option. The Commissioners, however, were directed not to consider any particular site – whether Yucca Mountain or elsewhere. They estimated that selection and evaluation of a site would take another 15 to 20 years (the cliché "kick the can down the road" seems inadequate). Nevertheless, the Department has reaffirmed its obligation to permanently (if eventually) dispose of civilian nuclear waste. In the meantime, civilian nuclear plant operators and owners have stored their waste themselves, usually on-site.[4]

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[2] 42 U.S.C. § 10101(18); *id.* § 10131(a)(4)-(5); *id.* § 10131(b); *id.* § 10132; *id.* § 10172; *id.* § 10222(a)(5).

[3] *See Ind. Mich. Power Co. v. Dep't of Energy*, 88 F.3d 1272, 1277 (D.C. Cir. 1996); Nuclear Waste Acceptance Issues, 60 Fed. Reg. 21,793, 21,794 (May 3, 1995).

[4] As a result of lengthy litigation before us and the Federal Circuit, the government has paid them about $1 billion in retrospective damages to cover some of the costs of storage since 1998, on claims of $6.4 billion. Those claims are not at issue here.

The Act also made the generators of nuclear waste responsible for the full costs of the disposal of *civilian* nuclear waste. The owners and operators were to pay an initial fee to cover the costs of disposing of pre-1983 waste, as well as an annual fee of 1.0 mil (one-tenth of a cent) per kilowatt-hour of nuclear-generated electricity to cover ongoing waste generation. These funds are deposited in the government-managed Nuclear Waste Fund, where they earn interest and investment income. According to budget accounting rules, these funds also count against the federal government's budget deficit ("aye, there's the rub"). When this suit was filed in 2010, owners and operators had paid the fees for nearly three decades (about $750 million a year on top of the initial charge). With investment income, the Fund's balance exceeded $24 billion, and by the end of this year, it will exceed $28 billion.

Although the Act mandates that the Fund cover the lifetime costs of the civilian disposal program – estimated to last over a hundred years – any excess funds must be returned to the payors. Congress anticipated that costs would be uncertain and could well change as the program progressed, so the Secretary was obliged to "annually review the amount of the fees to evaluate whether collection of the fee will provide sufficient revenues to offset the costs as defined in subsection (d) herein." Those costs include the identification, development, construction, operation, and maintenance of repositories for the waste, as well as associated facilities; research and development; and administration. "[I]n the event the Secretary determines that either insufficient or excess revenues are being collected, in order to recover the costs incurred by the Federal Government . . . the Secretary shall propose an adjustment to the fee to insure full cost recovery" and submit it to Congress. The Act – which pre-dated *INS v. Chadha*, 462 U.S. 919 (1983) – provides that the proposed adjustment shall become effective unless, within

90 days of submission, either house of Congress adopts a resolution disapproving it.[5]

The Secretary has never proposed an adjustment to the fee. Since at least 1990, the Department's policy has been "to conduct a thorough analysis annually and to recommend a change in the fee when there is a compelling case for the change." Between 1983 and 2008, fee adequacy assessments identified the expected costs of geologic disposal and compared them to projected revenues from the fee (which were based on projections of future nuclear power generation and interest accumulation).[6] Fee adequacy was calculated by creating models that adjusted for different key variables – for instance inflation, interest rates, future nuclear generation, program timing and total life cycle estimates – and forecasting whether the Fund would likely have a positive balance by the end of the program.

Between 1983 and 1987, the governing assumption was that two repositories would be used, but the Department had to account for a number of uncertainties that dramatically affected costs and revenues. It was unsure what type of rock – salt, tuff, basalt, or crystalline rock – would host the waste, or where the repositories would be located, and projected operational time frames varied widely. Fee adequacy reports dealt with these

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[5]42 U.S.C.. § 10222(a)(4).

[6]The Department did not consistently publish its fee adequacy reviews, and in some years – for instance when the reference cost estimate and other assumptions remained the same – apparently no new fee adequacy assessment was completed. The Department also completed a separate series of assessments, called "total system life cost" estimates, to periodically reassess program costs in light of recent developments. Fee adequacy assessments then used these cost estimates and compared them to expected revenues.

uncertainties by using a range of bounding cases; while there was tremendous variability among the different models, the Department nonetheless generated rough estimates of the expected margins of revenues over costs. The Secretary concluded that no fee adjustment was warranted during this period because under most, though not all, scenarios, the Fund showed only a modest positive balance at the end of the program's expected life cycle, and there was great uncertainty about future costs.

After Yucca Mountain was designated in 1987 as the only site the Department could consider, the Department estimated costs, and assessed fee adequacy, using assumptions specific to that site. Thus, the FY 2008 assessment assumed a program life cycle until 2129. The total estimated program cost was $97 billion, including historical costs since 1983; that also included anticipated defense-generated waste disposal costs for which petitioners are not responsible.[7] Construction authorization was anticipated in 2011, operations – the point when the greatest expenditures would be incurred – were to start in 2020, and emplacement of waste was to end in 2069, by which point 71 percent of all future costs would have been incurred.[8] Using a

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[7]The Act originally provided that the federal government would pay the costs of defense-generated nuclear waste directly into the Nuclear Waste Fund. However, Congress in 1993 changed that requirement to instead establish a separate Defense Nuclear Waste Disposal appropriation. That appropriation is administered, and counted, separately from the Nuclear Waste Fund; to date, it has a balance of $3.7 billion. Since FY 2011, however, the federal government has not made any requests for appropriations to cover the costs associated with disposal of this waste.

[8]After emplacement ends, the repository would remain in operation for another fifty years for decommissioning and monitoring in preparation for closing.

cash flow analysis (adding expected fee and investment income and subtracting estimated costs for each year from 2008 to 2129), the assessment concluded that the fee was certainly adequate because most scenarios showed the Fund would have a positive balance in 2129. No downward adjustment was deemed warranted, however, because the Secretary did not see compelling evidence it was appropriate – the analysis from a single year, the Secretary suggested, would not be enough to make a judgment.

After the Administration abandoned Yucca Mountain in 2009, the Secretary apparently did not issue a fee evaluation or determination that fiscal year, but the Department did announce that all the fees being paid by civilian nuclear generators and owners were still considered "essential" to meet the government's waste disposal obligations. The Secretary's inaction gave rise to an initial suit by petitioners dismissed as moot only when, after briefs were filed, the Secretary issued the 2010 determination, the subject of this suit. It stated that the Secretary would *not* propose an adjustment of the fee based on an enclosed memorandum from the Director of the Office of Standard Contract Management. That memorandum, although affirming that the Department was committed to disposing of civilian waste and that the fees needed to cover all future program costs, did not identify any of those costs, nor did it mention expected revenues. Instead, it stressed the Secretary's discretion in reviewing fee adequacy, and concluded that "we are aware of no evidence that would provide a reasoned and sound basis for determining that excess or insufficient revenues are being collected for the costs for which the Department is responsible." It noted that the Blue Ribbon Commission had not yet made any recommendations about future disposal methods. The Director added that, in any event, the current fee was adequate because, using Yucca Mountain as the best available proxy, the most recent estimate of its life cycle cost (in the FY

2008 assessment) was "$97 billion," and the fee had previously been deemed adequate based on that estimate.

II.

Petitioners argue that the Secretary violated his statutory obligation to annually "evaluate whether collection of the fee will provide sufficient revenues to offset . . . costs" because he neither conducted a cost evaluation nor accounted for the disposal program's uncertain schedule. They also object that the Department's alternative approach, using Yucca Mountain to estimate future costs, was arbitrary and capricious (violating the APA) in light of the Department's unequivocal decision to discontinue use of that site. Petitioners contend that any validly conducted fee adequacy review would require the Secretary to find the current fee excessive, and therefore it should be adjusted to zero. Now that Yucca Mountain has been terminated, the program's future course is uncertain and no costs can be quantified. Accordingly, petitioners seek an order directing the Secretary to determine that the fees be suspended pending development of a new waste disposal program and to submit that determination to Congress.

The government responds that the Act's only requirement is that the Secretary review the fee annually; he has complete discretion as to the manner in which he identifies and evaluates costs. And if, in his judgment, there is insufficient information available to determine the fee is either insufficient or excessive, he is not obliged to call for an adjustment. According to the government, that is the situation here. As a fallback, the government insists that Yucca Mountain's costs can be used as a continuing proxy, and thereby justifies the Secretary's failure to make any new evaluations of potential costs juxtaposed against revenues.

Although the government contends that its statutory interpretation is the obvious one, it also asserts that even if we regarded the language as ambiguous, we should afford it *Chevron* deference, which leads to an argument as to whether *Chevron* deference is warranted. We think it unnecessary to resolve that issue because we believe the government's interpretation is unacceptable – whatever the degree of deference afforded.

The government focuses on the statutory language requiring the Secretary to propose an adjustment "if [he] determines that either insufficient or excess revenues are being collected," arguing that this wording bestows discretion on the Secretary. There is certainly some discretion given to the Secretary in the *manner* in which he calculates costs, but the government's argument suggests the Secretary has no affirmative obligation to conduct the sort of inquiry and analysis done in the past. He may, like an ostrich, put his head in the sand; so long as he is unaware of any information that questions the existing fee structure, he is not obliged to propose an adjustment. That interpretation is farfetched, almost absurd. It ignores the preceding sentence, obliging the Secretary "to evaluate whether the collection of the fee will provide sufficient revenues" to offset program costs. That plain language utterly destroys the Secretary's claim that he can remain entirely passive and only act if some *deus ex machina* were to bring him information.

The Secretary's alternate justification, that he can continue to rely on the FY 2008 assessment's cost calculations for Yucca Mountain as a proxy, fares no better. It is unreasonable (therefore arbitrary and capricious) to so blithely rely on a proxy that the Department itself has deemed unworkable. The Secretary has not said why Yucca Mountain was rejected, nor has he indicated what characteristics of Yucca Mountain might make it typical of any site. Morever, to assume the validity of

Yucca Mountain's cost estimate without taking into account the enormous delay in even selecting a new site ignores what the Department's own previous estimates have regarded as a critical aspect of fee adequacy – the timing of costs. The FY 2008 assessment assumed construction would begin in 2011 and operations would start in 2020. That schedule would have resulted in major near-term expenditures, and therefore a reduction in interest earned by the Fund. If these expenditures are to be pushed far back – which the Secretary must assume – he must compare them against a likely significant increase in the Fund through interest accumulation.

To add to the irrationality of the Department's choice of Yucca Mountain as a proxy is the 2010 determination's estimation of the life cycle costs of Yucca Mountain – i.e., $97 billion. The government's brief emphasized that that cost is "nearly four times" the balance in the Fund. Unfortunately, and somewhat embarrassingly, this figure is obviously inflated. As the Department's FY 2008 determination explained, $97 billion includes amounts that the Fund (and, therefore, petitioners) need not cover. Those amounts include program costs already paid, as well as the costs of disposing of waste the government generated from defense-related activities. Indeed, expected future costs are $82.5 billion, of which, according to the FY 2008 assessment, only 80 percent ($66 billion) stems from expected civilian waste disposal costs. In other words, the government submits to us a calculation that appears to be off by $30 billion – which, even today, is real money. Assuming that the Fund continues to accumulate interest at its present rate, rudimentary calculations suggest the Fund could reach $66 billion in less than twenty years – i.e., well within the range of time the Blue Ribbon Commission estimates it would take to even designate a new site – even if no new fee revenues were added after 2011.

Moreover, the 2010 determination is an unexplained departure from long-standing Department policy and therefore arbitrary and capricious on that ground as well. Long before the Yucca Mountain program was chosen, the Secretary, as we have noted, ran rather sophisticated evaluations of the potential costs of a hypothetical repository as part of his policy of conducting a "thorough analysis." His 2010 determination falls far below the Department's own previous standard. Of course, it may well be that, despite the public statements, the Department and the Administration really believe that it will eventually turn back to Yucca Mountain, but if that is so, it must be acknowledged.

* * *

In sum, we readily conclude that the Secretary's determination is legally inadequate. Which brings us to the remedy. Petitioners ask us to order the Secretary to determine that fees should be suspended unless and until a new disposal program is commenced, and that, in accordance with the statute, such a determination should be submitted to Congress.

As we have noted, the Act, as originally enacted, antedated *INS v. Chadha* and provided that any fee adjustment by the Secretary had to be submitted to Congress for 90 days, where it could be defeated by a one-house veto. The Eleventh Circuit held, as it was obliged, that that procedure was unconstitutional, and that the remedy was to read the Act to say that if the Secretary were to make a determination that the fee was either excessive or inadequate, he should submit it to Congress, to become effective within 90 days of submission (which is not much different than any agency action). *See Ala. Power Co. v. U.S. Dep't of Energy*, 307 F.3d 1300, 1306-08 (11th Cir. 2002). Interpreting an analogous statute, we have taken essentially the same position on remedying similarly defective statutes. *See Alaska Airlines v. Donovan*, 766 F.2d 1550 (D.C. Cir. 1985).

With the one-house veto no longer in the picture, we think our authority to review the Secretary's 2010 determination under the Administrative Procedure Act includes the power to direct the Secretary to suspend the fee.[9] But it is premature to do so now. It is appropriate for us simply to declare that the Secretary's determination is legally defective and to remand. However, we are mindful that petitioners were obliged to first file suit in October 2010, in light of the Secretary's failure to conduct any fee adequacy determination since FY 2008. It was only after initial briefing was submitted that the Secretary issued his 2010 determination, thereby rendering the initial case moot. In light of that Departmental disposition to delay, we will order the Secretary to respond to the remand within six months of the issuance of the mandate and this panel will retain jurisdiction.

So ordered.

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[9]Of course, notwithstanding any decision we would make, the Secretary, while complying with any order of the court, would also be free to advise Congress as he wished.

COMMONWEALTH OF PENNSYLVANIA
PUBLIC UTILITY COMMISSION
400 NORTH STREET
HARRISBURG, PA 17120

ROBERT F. POWELSON
CHAIRMAN

June 1, 2012

To: PA Congressional Delegation

Fr: Robert F. Powelson, Chairman RFP

Re: Shimkus Amendment to HR 5325 (Yucca Mountain Funding)

Dear Member:

In the near future, as early as today, the House will vote on whether to restore funding to the Yucca Mountain nuclear waste repository project. The outcome of this vote could have a very big impact on ratepayers here in Pennsylvania. That is why I'm writing to you today.

Since 1983, Pennsylvania ratepayers have paid over $1.4 billion into the design and construction of a national nuclear waste repository. In fact, we are the second largest payer into the nuclear waste fund with little to show for it. The PUC is deeply troubled by the current lack of direction on this project; keeping in mind, many of our nuclear operators here in the Commonwealth have been spending millions of dollars to safely store spent nuclear fuel on site.

It is my hope that you will lend your support to Congressman Shimkus' amendment to HR 5325 which simply provides $10 million in additional funding to finish the legally required licensing process for Yucca Mountain. The Shimkus amendment is budget neutral and fully offset by taking funds from the DOE's departmental administration account. This funding will provide the Nuclear Regulatory Commission the necessary monies to finish their thorough, objective and technical review of the Yucca Mountain project.

Your favorable consideration of this request is greatly appreciated.

PRINTER'S NO. 3635

THE GENERAL ASSEMBLY OF PENNSYLVANIA

HOUSE RESOLUTION

No. 750 Session of 2012

INTRODUCED BY GODSHALL, CUTLER, EVERETT, KOTIK, MARSHALL, MILLARD, PICKETT, QUIGLEY, SAYLOR AND SWANGER, JUNE 4, 2012

REFERRED TO COMMITTEE ON STATE GOVERNMENT, JUNE 4, 2012

A RESOLUTION

Memorializing the President and the Congress of the United States to provide for the storage of used nuclear fuel.

WHEREAS, Nuclear utility ratepayers throughout the United States have contributed more than $37,000,000,000 in fees and interest, as mandated by the Nuclear Waste Policy Act of 1982, for the purpose of removing used nuclear fuel from commercial reactor sites; and

WHEREAS, Nuclear utility ratepayers in this Commonwealth have contributed more than $3,200,000,000 in fees and interest to the Nuclear Waste Fund; and

WHEREAS, The Federal Government has failed to satisfy the statutory requirement in the Nuclear Waste Policy Act of 1982 to begin accepting used nuclear fuel in 1998 and has failed to meet the terms of its contracts with United States nuclear plant operators; and

WHEREAS, The 104 operating commercial reactors in the United States have accumulated more than 67,000 metric tons of used nuclear fuel which is stored at plant sites, including 6,000

metric tons stored at five sites within this Commonwealth; and

WHEREAS, The current administration and Congress have terminated funding of all activities related to the license review or further development of a permanent central disposal repository at the Yucca Mountain Project in Nevada, which has been the Federal Government's only intended destination for used commercial nuclear fuel; and

WHEREAS, There are lawsuits pending to attempt to compel the Federal Government to meet its obligations under the Nuclear Waste Policy Act of 1982; and

WHEREAS, In January 2010, the current administration appointed a Blue Ribbon Commission on America's Nuclear Future comprised of distinguished American scientists and nuclear policymakers to review various alternative options and make recommendations for future safe management of United States commercial used nuclear fuel; and

WHEREAS, The Blue Ribbon Commission has recommended an integrated nuclear fuel management program incorporating all of the following:

(1) The development of one or more Nuclear Regulatory Commission-licensed private or government-owned centralized interim storage facilities in communities in states that would willingly host the facilities.

(2) Continued public and private sector research, development and deployment of used fuel and nuclear waste recycling technologies to close the nuclear fuel cycle in a safe, environmentally responsible, proliferation-resistant and economically viable process.

(3) Assured access by the nuclear fuel management program to revenues generated by consumers through continued

payments and to existing balances in the Nuclear Waste Fund; therefore be it

RESOLVED, That the House of Representatives memorialize the President and the Congress of the United States to do all of the following:

(1) Adopt legislation enabling the construction of one or more centralized interim nuclear fuel storage facilities through directives to the United States Department of Energy and through incentives to interested communities funded by the accumulated Nuclear Waste Fund.

(2) Recognize that there are communities that are willing to host centralized fuel storage facilities and states that are ready to voluntarily accept used fuel.

(3) Assure access by the nuclear fuel management program to revenues generated by consumers' continuing fee payments and to the significant balance in the Nuclear Waste Fund or, in the alternative, refund payments and interest to nuclear utility ratepayers.

(4) Enable one or more Nuclear Regulatory Commission-licensed private interim storage facilities to meet this public policy need in the United States;

and be it further

RESOLVED, That copies of this resolution be transmitted to the President, presiding officers of each house of Congress and to each member of Congress from Pennsylvania.

House Energy & Commerce Committee

FEATURED STORY
VIDEO: Meet the E&C Committee Majority Members
VIDEO: Energy Excuses VS. Energy Solutions

Watch Live: Commerce, Manufacturing, and Trade Markup at 9:00AM ET

PRESS RELEASE

Strong Bipartisan Majority Approves Funding Boost for Yucca Mountain License Review

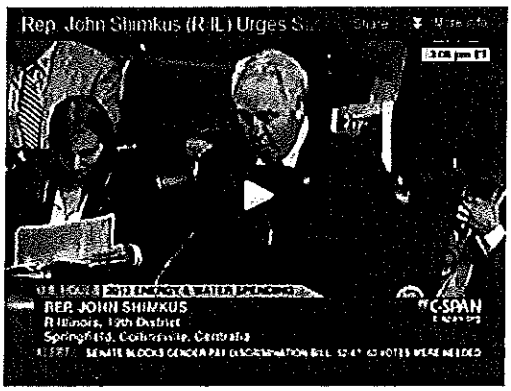
June 6, 2012

WASHINGTON, DC – The House of Representatives today passed an amendment to the Energy and Water Development and Related Agencies Appropriations Act to provide the Nuclear Regulatory Commission with additional funds to finish its review of the license application for the Yucca Mountain nuclear repository. The amendment, offered by Environment and the Economy Subcommittee Chairman John Shimkus (R-IL), provides $10 million in additional funding to allow the NRC to resume its review of the license application. The amendment received broad bipartisan support and was adopted by a vote of 326 to 81, with the support of 98 Democrats. A similar measure passed the House last summer by e vote of 297-130.

Last year, the NRC failed to overturn the Atomic Safety Licensing Board's ruling that the Department of Energy may not withdraw its application for Yucca Mountain. This decision affirmed the legal responsibility of the NRC to review the license application, but the commission still instructed the Board to close out the license review process citing inadequate funding. Shimkus' amendment increases the provided funds in the bill from $25 million to $35 million to ensure the commission will heve adequate funds to carry out the legally mandeted review process.

"This vote reaffirms bipartisan determination to proceed with Yucca Mountain," said Energy and Commerce Committee Chairman Fred Upton (R-MI). "I applaud Mr. Shimkus for offering this amendment to ensure the future of Yucca Mountain is no longer held captive to political games by allowing the NRC, as the independent objective federal agency, to finish its technical review."

To view Shimkus' remarks on his amendment, click here.



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U.S. Representative Fred Upton

Congressman Fred Upton has represented the commonsense values of southwest Michigan since 1987. In 2010, Fred was selected by his House colleagues to serve as Chairman of the Committee on Energy and Commerce. Read More»;

NATIONAL ASSOCIATION OF REGULATORY UTILITY COMMISSIONERS
For Immediate Release: **June 7, 2012**
Contact: Rob Thormeyer, 202-898-9382, rthormeyer@naruc.org

States Urge Action on Nuclear-Waste Policies

WASHINGTON—Leadership from Congress and the White House is essential if the country's nuclear-waste policies are to gain momentum, a key State regulator told Congress today.

In testimony before a Senate subcommittee, National Association of Regulatory Utility Commissioners President David Wright of South Carolina expressed frustration with the government's handling of nuclear-waste issues and said Congress and the Executive Branch need to put forth workable solutions that do not overburden consumers.

President Wright testified before the Senate Environment and Public Works Committee Subcommittee on Clean Air and Nuclear Safety. The hearing focused on the early 2012 report from the Blue Ribbon Commission on America's Nuclear Future which proposed a series of recommendations for jumpstarting the nation's stalled nuclear-waste program.

The BRC, appointed by the Secretary of Energy, recommended reforming the Nuclear Waste Fund, which pays for the program through fees assessed to nuclear utilities and their consumers, and developing a consent-based approach for selecting nuclear-waste repository locations.

While the Nuclear Waste Policy Act of 1982 remains the law, NARUC agrees with many of the recommendations. President Wright particularly commended the report's proposals to alter the Nuclear Waste Fund. In fact, doing so is "essential" for most of the BRC's other recommendations to proceed, he said.

Consent-based siting is also a critical aspect of any new nuclear-waste policy, he said. "Certainly, future siting efforts will have to account for widely divergent demographics/populations as well as unique proposed repository topologies/geologies," President Wright said. "Since 'one-size-certainly-does-not-fit-all' in this context, NARUC agrees that flexibility in approach is a necessary prerequisite to future siting initiatives."

Still, despite the report and apparent consensus on several key recommendations, unless and until Congress and the Administration put these proposals into law, the nation's nuclear-waste policy will remain stalled.

The BRC report may proclaim that policymakers "know what we have to do; we know we have to do it, and we even know how to do it," thus far Washington has shown no signs of actually resolving the problem, President Wright said. "[O]ur assessment is that there are too many people who are content to pass the problem along to future generations and 'leave the waste where it is.' It is fitting for the [Blue Ribbon] Commission to call for prompt action developing both consolidated interim storage and beginning the search for a new repository, but we may need public education and outreach to help persuade some who seem to favor the 'no action' alternative."

* * * * * * * * * * * * * * * *

United States Court of Appeals
FOR THE DISTRICT OF COLUMBIA CIRCUIT

No. 11-1045 **September Term, 2011**
FILED ON: JUNE 8, 2012

STATE OF NEW YORK, ET AL.,
PETITIONERS

v.

NUCLEAR REGULATORY COMMISSION AND UNITED STATES OF AMERICA,
RESPONDENTS

STATE OF NEW JERSEY, ET AL.,
INTERVENORS

Consolidated with 11-1051, 11-1056, 11-1057

On Petitions for Review of Orders
of the Nuclear Regulatory Commission

Before: SENTELLE, *Chief Judge*, TATEL and GRIFFITH, *Circuit Judges*

JUDGMENT

These causes came on to be heard on the petitions for review of orders of the Nuclear Regulatory Commission and were argued by counsel. On consideration thereof, it is

ORDERED and **ADJUDGED** that the petitions for review be granted, the WCD Update and TSR be vacated, and the cases be remanded for further proceedings, in accordance with the opinion of the court filed herein this date.

Per Curiam

FOR THE COURT:
Mark J. Langer, Clerk

BY:
/s/
Jennifer M. Clark
Deputy Clerk

Date: June 8, 2012

Opinion for the court filed by Chief Judge Sentelle.

United States Court of Appeals

FOR THE DISTRICT OF COLUMBIA CIRCUIT

No. 11-1045 **September Term 2011**

NRC-75FR81032

Filed On: June 8, 2012 [1377721]

State of New York, et al.,

Petitioners

v.

Nuclear Regulatory Commission and United States of America,

Respondents

State of New Jersey, et al.,
Intervenors

Consolidated with 11-1051, 11-1056, 11-1057

ORDER

It is **ORDERED**, on the court's own motion, that the Clerk withhold issuance of the mandate herein until seven days after disposition of any timely petition for rehearing or petition for rehearing en banc. See Fed. R. App. P. 41(b); D.C. Cir. Rule 41. This instruction to the Clerk is without prejudice to the right of any party to move for expedited issuance of the mandate for good cause shown.

FOR THE COURT:
Mark J. Langer, Clerk

BY: /s/
Jennifer M. Clark
Deputy Clerk

United States Court of Appeals

FOR THE DISTRICT OF COLUMBIA CIRCUIT

Argued March 16, 2012 Decided June 8, 2012

No. 11-1045

STATE OF NEW YORK, ET AL.,
PETITIONERS

v.

NUCLEAR REGULATORY COMMISSION AND UNITED STATES OF AMERICA,
RESPONDENTS

STATE OF NEW JERSEY, ET AL.,
INTERVENORS

Consolidated with 11-1051, 11-1056, 11-1057

On Petitions for Review of Orders
of the Nuclear Regulatory Commission

Monica Wagner, Deputy Bureau Chief, Office of the Attorney General for the State of New York, argued the cause for petitioners States and Prairie Island Indian Community Petitioners. With her on the briefs were *Eric T. Schneiderman*, Attorney General, Office of the Attorney General for the State of New York, *John J. Sipos* and *Janice A. Dean*, Assistant Attorneys General, *Barbara D. Underwood*, Solicitor General, *Brian A. Sutherland*, Assistant Solicitor General of Counsel,

Jeffrey S. Chiesa, Attorney General, Office of the Attorney General for the State of New Jersey, *Kevin P. Auerbacher*, Assistant Attorney General, *Ruth E. Musetto*, Deputy Attorney General, *William H. Sorrell*, Attorney General, Office of the Attorney General for the State of Vermont, *Thea Schwartz*, Assistant Attorney General, *George Jepsen*, Attorney General, Office of the Attorney General for the State of Connecticut, *Robert Snook*, Assistant Attorney General, and *Joseph F. Halloran*.

Geoffrey H. Fettus argued the cause for petitioners the Environmental Groups. With him on the briefs were *Andres J. Restrepo* and *Diane Curran*.

Robert M. Rader, Senior Attorney, U.S. Nuclear Regulatory Commission, argued the cause for respondents. With him on the brief were *John E. Arbab*, Attorney, U.S. Department of Justice, *Stephen G. Burns*, General Counsel, U.S. Nuclear Regulatory Commission, and *John F. Cordes Jr.*, Solicitor.

David A. Repka argued the cause for intervenors Nuclear Energy Institute, et al., in support of respondents. With him on the brief were *Brad Fagg* and *Jerry Bonanno*. *Anne W. Cottingham* entered an appearance.

Before: SENTELLE, *Chief Judge*, TATEL and GRIFFITH, *Circuit Judges*.

Opinion for the Court filed by *Chief Judge* SENTELLE.

SENTELLE, *Chief Judge*: Four states, an Indian community, and a number of environmental groups petition this Court for review of a Nuclear Regulatory Commission ("NRC" or "Commission") rulemaking regarding temporary storage and permanent disposal of nuclear waste. We hold that the

rulemaking at issue here constitutes a major federal action necessitating either an environmental impact statement or a finding of no significant environmental impact. We further hold that the Commission's evaluation of the risks of spent nuclear fuel is deficient in two ways: First, in concluding that permanent storage will be available "when necessary," the Commission did not calculate the environmental effects of failing to secure permanent storage—a possibility that cannot be ignored. Second, in determining that spent fuel can safely be stored on site at nuclear plants for sixty years after the expiration of a plant's license, the Commission failed to properly examine future dangers and key consequences. For these reasons, we grant the petitions for review, vacate the Commission's orders, and remand for further proceedings.

I. Background

This is another in the growing line of cases involving the federal government's failure to establish a permanent repository for civilian nuclear waste. *See, e.g.*, *In re Aiken County*, 645 F.3d 428, 430–31 (D.C. Cir. 2011) (recounting prior cases). We address the Commission's recent rulemaking regarding the prospects for permanent disposal of nuclear waste and the environmental effects of temporarily storing such material on site at nuclear plants until a permanent disposal facility is available.

After four to six years of use in a reactor, nuclear fuel rods can no longer efficiently produce energy and are considered "spent nuclear fuel" ("SNF"). Blue Ribbon Commission on America's Nuclear Future, *Report to the Secretary of Energy* 10–11 (2012). Fuel rods are thermally hot when removed from reactors and emit great amounts of radiation—enough to be fatal in minutes to someone in the immediate vicinity. *Id.* Therefore, the rods are transferred to racks within deep, water-filled pools

for cooling and to protect workers from radiation. After the fuel has cooled, it may be transferred to dry storage, which consists of large concrete and steel "casks." Most SNF, however, will remain in spent-fuel pools until a permanent disposal solution is available. *Id.* at 11.

Even though it is no longer useful for nuclear power, SNF poses a dangerous, long-term health and environmental risk. It will remain dangerous "for time spans seemingly beyond human comprehension." *Nuclear Energy Inst., Inc. v. Envtl. Prot. Agency*, 373 F.3d 1251, 1258 (D.C. Cir. 2004) (per curiam). Determining how to dispose of the growing volume of SNF, which may reach 150,000 metric tons by the year 2050, is a serious problem. *See* Blue Ribbon Commission, *supra*, at 14. Yet despite years of "blue ribbon" commissions, congressional hearings, agency reports, and site investigations, the United States has not yet developed a permanent solution. That failure, declared the most recent "blue ribbon" panel, is the "central flaw of the U.S. nuclear waste management program to date." *Id.* at 27. Experts agree that the ultimate solution will be a "geologic repository," in which SNF is stored deep within the earth, protected by a combination of natural and engineered barriers. *Id.* at ix, 29. Twenty years of work on establishing such a repository at Yucca Mountain was recently abandoned when the Department of Energy decided to withdraw its license application for the facility. *Id.* at 3. At this time, there is not even a prospective site for a repository, let alone progress toward the actual construction of one.

Due to the government's failure to establish a final resting place for spent fuel, SNF is currently stored on site at nuclear plants. This type of storage, optimistically labeled "temporary storage," has been used for decades longer than originally anticipated. The delay has required plants to expand storage pools and to pack SNF more densely within them. The lack of

progress on a permanent repository has caused considerable uncertainty regarding the environmental effects of temporary SNF storage and the reasonableness of continuing to license and relicense nuclear reactors.

In this case, petitioners challenge a 2010 update to the NRC's Waste Confidence Decision ("WCD"). The original WCD came as the result of a 1979 decision by this court remanding the Commission's decision to allow the expansion of spent-fuel pools at two nuclear plants. *Minnesota v. NRC*, 602 F.2d 412 (D.C. Cir. 1979). In *Minnesota*, we directed the Commission to consider "whether there is reasonable assurance that an off-site storage solution [for spent fuel] will be available by . . . the expiration of the plants' operating licenses, and if not, whether there is reasonable assurance that the fuel can be stored safely at the sites beyond those dates." *Id.* at 418. The WCD is the Commission's determination of those risks and assurances.

The original WCD was published in 1984 and included five "Waste Confidence Findings." Briefly, those findings declared that: 1) safe disposal in a mined geologic repository is technically feasible, 2) such a repository will be available by 2007–2009, 3) waste will be managed safely until the repository is available, 4) SNF can be stored safely at nuclear plants for at least thirty years beyond the licensed life of each plant, and 5) safe, independent storage will be made available if needed. Waste Confidence Decision, 49 Fed. Reg. 34,658, 34,659–60 (Aug. 31, 1984). The Commission updated the WCD in 1990 to reflect new understandings about waste disposal and to predict the availability of a repository by 2025. *See* Waste Confidence Decision Review, 55 Fed. Reg. 38,474, 38,505 (Sept. 18, 1990). The Commission reviewed the WCD again in 1999 without altering it. *See* Waste Confidence Decision Review: Status, 64 Fed. Reg. 68,005, 68,006–07 (Dec. 6, 1999).

In 2008, the Commission proposed revisions to the Waste Confidence Findings, and, after considering public comments, made revisions in 2010. Waste Confidence Decision Update, 75 Fed. Reg. 81,037 (Dec. 23, 2010). That decision, under review in this case, reaffirmed three of the Waste Confidence Findings and updated two. First, the Commission revised Finding 2, which, as of 1990, expected that a permanent geologic repository would be available in the first quarter of the twenty-first century. As amended, Finding 2 now states that a suitable repository will be available "when necessary," rather than by a date certain. *Id.* at 81,038. In reaching that conclusion, the Commission examined the political and technical obstacles to permanent storage and determined that a permanent repository will be ready by the time the safety of temporary on-site storage can no longer be assured. *Id.*

Finding 4 originally held that SNF could be safely stored at nuclear reactor sites without significant environmental effects for at least thirty years beyond each plant's licensed life, including the license-renewal period. *Id.* at 81,039. In revising that finding, the Commission examined the potential environmental effects from temporary storage, such as leakages from the spent-fuel pools and fires caused by the SNF becoming exposed to the air. Concluding that previous leaks had only a negligible near-term health effect and that recent regulatory enhancements will further reduce the risk of leaks, the Commission determined that leaks do not pose the threat of a significant environmental impact. *Id.* at 81,069–71. The Commission also found that pool fires are sufficiently unlikely as to pose no significant environmental threat. *Id.* at 81,070–71. As amended, Finding 4 now holds that SNF can be safely stored at plants for at least sixty years beyond the licensed life of a plant, instead of thirty. *Id.* at 81,074. In addition, the Commission noted in its final rule that it will be developing a plan for longer-term storage and will conduct a full assessment

of the environmental impact of storage beyond the sixty-year post-license period. *Id.* at 81,040. Based on the revised WCD, the Commission released a new Temporary Storage Rule ("TSR") enacting its conclusions and updating its regulations accordingly. *See* Consideration of Environmental Impacts of Temporary Storage of Spent Fuel after Cessation of Reactor Operation, 75 Fed. Reg. 81,032 (Dec. 23, 2010); 10 C.F.R. § 51.23(a). Petitioners challenge the amended 10 C.F.R. § 51.23(a) based on both Finding 2 and Finding 4.

II. The Commission's Obligations Under NEPA

The National Environmental Policy Act of 1969 ("NEPA"), 42 U.S.C. § 4321 *et seq.*, requires federal agencies such as the Commission to examine and report on the environmental consequences of their actions. NEPA is an "essentially procedural" statute intended to ensure "fully informed and well-considered" decisionmaking, but not necessarily the best decision. *Vermont Yankee Nuclear Power Corp. v. NRDC*, 435 U.S. 519, 558 (1978). Under NEPA, each federal agency must prepare an Environmental Impact Statement ("EIS") before taking a "major Federal action[] significantly affecting the quality of the human environment." 42 U.S.C. § 4332(2)(C). An agency can avoid preparing an EIS, however, if it conducts an Environmental Assessment ("EA") and makes a Finding of No Significant Impact ("FONSI"). *See Sierra Club v. Dep't of Transp.*, 753 F.2d 120, 127 (D.C. Cir. 1985); *see also Theodore Roosevelt Conservation P'ship v. Salazar*, 616 F.3d 497, 503–04 (D.C. Cir. 2010) (explaining NEPA procedures in detail). The issuance or reissuance of a reactor license is a major federal action affecting the quality of the human environment. *See New York v. Nuclear Regulatory Comm'n*, 589 F.3d 551, 553 (2d Cir. 2009).

The parties here dispute whether the WCD itself constitutes a major federal action. To petitioners, the WCD is a major federal action because it is a predicate to every decision to license or relicense a nuclear plant, and the findings made in the WCD are not challengeable at the time a plant seeks licensure. The Commission contends that because the WCD does not authorize the licensing of any nuclear reactor or storage facility, and because a site-specific EIS will be conducted for each facility at the time it seeks licensure, the WCD is not a major federal action. To the Commission, the WCD is simply an answer to this court's mandate in *Minnesota* to ensure that plants are only licensed while the NRC has reasonable assurance that permanent disposal of the resulting waste will be available. The Commission also contends that the WCD constitutes an EA supporting the revision of 10 C.F.R. § 51.23(a), and because the EA found no significant environmental impact, an EIS is not required.

We agree with petitioners that the WCD rulemaking is a major federal action requiring either a FONSI or an EIS. The Commission's contrary argument treating the WCD as separate from the individual licensing decisions it enables fails under controlling precedent.

We have long held that NEPA requires that "environmental issues be considered at every important stage in the decision making process concerning a particular action." *Calvert Cliffs' Coordinating Comm., Inc. v. Atomic Energy Comm'n*, 449 F.2d 1109, 1118 (D.C. Cir. 1971). The WCD makes generic findings that have a preclusive effect in all future licensing decisions—it is a pre-determined "stage" of each licensing decision. NEPA established the Council on Environmental Quality ("CEQ") "with authority to issue regulations interpreting it." *Dep't of Transp. v. Public Citizen*, 541 U.S. 752, 757 (2004). The CEQ has defined major federal actions to include actions with

"[i]ndirect effects, which are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable." 40 C.F.R. §§ 1508.8, 1508.18; *Public Citizen*, 541 U.S. at 763; *see also Andrus v. Sierra Club*, 442 U.S. 347, 358 (1979) (holding that the CEQ's NEPA interpretations are entitled to substantial deference); *accord CTIA-Wireless Ass'n v. FCC*, 466 F.3d 105, 115 (D.C. Cir. 2006). It is not only reasonably forseeable but eminently clear that the WCD will be used to enable licensing decisions based on its findings. The Commission and the intervenors contend that the site-specific factors that differ from plant to plant can be challenged at the time of a specific plant's licensing, but the WCD nonetheless renders uncontestable general conclusions about the environmental effects of plant licensure that will apply in every licensing decision. *See* 10 C.F.R. § 51.23(b).

Petitioners' argument continues by suggesting that the WCD lacks an EIS and must be reversed on that basis. Not necessarily. No EIS is required if the agency conducts an EA and issues a FONSI sufficiently explaining why the proposed action will not have a significant environmental impact. *Public Citizen*, 541 U.S. at 757–58. Though we give considerable deference to an agency's decision regarding whether to prepare an EIS, the agency must 1) "accurately identif[y] the relevant environmental concern," 2) take a "hard look at the problem in preparing its EA," 3) make a "convincing case for its finding of no significant impact," and 4) show that even if a significant impact will occur, "changes or safeguards in the project sufficiently reduce the impact to a minimum." *Taxpayers of Michigan Against Casinos v. Norton*, 433 F.3d 852, 861 (D.C. Cir. 2006) (internal quotation omitted). An agency's decision not to prepare an EIS must be set aside if it is "arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law." *Public Citizen*, 541 U.S. at 763 (quoting 5 U.S.C. § 706(2)(A)).

III. Availability of a Permanent Repository

With these NEPA obligations in mind, we turn to the Commission's conclusion that a permanent repository for SNF will be available "when necessary." In so concluding, the Commission examined the historical difficulty—now measured in decades rather than years—in establishing a permanent facility. *See, e.g.*, Waste Confidence Decision Update, 75 Fed. Reg. at 81,049. Though a number of commenters suggested that the social and political barriers to building a geologic repository are too great to conclude that a facility could be built in any reasonable timeframe, the Commission believes that the lessons learned from the Yucca Mountain program and the Blue Ribbon Commission on America's Nuclear Future will ensure that, through "open and transparent" decisionmaking, a consensus would be reached. *Id.* Further, the Commission noted that the Nuclear Waste Policy Act mandates a repository program, demonstrating the continued commitment and obligation of the federal government to pursue one. The scientific and experiential knowledge of the past decades, the Commission explained, would enable the government to create a suitable repository by the time one is needed. *Id.*

A.

Petitioners argue that the Commission's conclusion regarding permanent storage violates NEPA in two ways: First, it fails to fully account for the significant societal and political barriers that may delay or prevent the opening of a repository. Second, the Commission's conclusion that a permanent repository will be available "when necessary" fails to define the term "necessary" in any meaningful way and does not address the effects of a failure to establish a repository in time. Petitioners further contest the Commission's claim that the WCD constitutes an EA for permanent disposal, let alone the

EIS they contend is required here.

The Commission responds by contending that it "candidly acknowledged" the societal and political challenges, and crafted the WCD to account for those risks. Overcoming political obstacles is not the responsibility of the Commission, it contends, and the NRC's conclusion that institutional obstacles will not prevent a repository from being built is entitled to substantial deference. The Commission contends that the selection of a precise date for Finding 2 is not required by NEPA or any other laws governing the NRC, and the Commission used the "when necessary" formulation as far back as 1977. *See NRDC v. Nuclear Regulatory Comm'n*, 582 F.2d 166, 170, 175 (2d Cir. 1978).

As for examining the environmental effects of failing to establish a repository, the Commission contends that the WCD is an EA supporting the revision of 10 C.F.R. § 51.23(a). No EIS is necessary regarding permanent disposal because, the Commission argues, the WCD is not a major federal action, and conducting an EIS for this issue would be the sort of "abstract exercise" the Supreme Court declined to require in *Baltimore Gas and Electric Company v. NRDC*, 462 U.S. 87, 100 (1983). Further, the Commission's existing "Table S-3" already considers the environmental effects of the nuclear fuel cycle generally and found no significant impacts. Therefore, the Commission believes, no EIS is required.

B.

The Commission's "when necessary" finding is already imperiled by our conclusion that the WCD is a major federal action. We hold that the WCD must be vacated as to its revision to Finding 2 because the WCD fails to properly analyze the environmental effects of its permanent disposal conclusion.

While we share petitioners' considerable skepticism as to whether a permanent facility can be built given the societal and political barriers to selecting a site, we need not resolve whether the Commission adequately considered those barriers. Likewise, we need not decide whether, as the Commission contends, an agency's interpretation of the political landscape surrounding its field of expertise merits deference. Instead, we hold the WCD is defective on far simpler grounds: As we have determined, the WCD is a major federal action because it is used to allow the licensing of nuclear plants. *See supra* Part II. Therefore, the WCD requires an EIS or, alternatively, an EA that concludes with a finding of no significant impact. The Commission did not supply a suitable FONSI here because it did not examine the environmental effects of failing to establish a repository.

Even taking the Commission's word that the WCD constitutes an EA for the permanent storage conclusion, *see* Waste Confidence Decision Update, 75 Fed. Reg. at 81,042, the EA is insufficient because a finding that "reasonable assurance exists that sufficient mined geologic repository capacity will be available when necessary," *id.* at 81,041, does not describe a probability of failure so low as to dismiss the potential consequences of such a failure. Under NEPA, an agency must look at both the probabilities of potentially harmful events and the consequences if those events come to pass. *See, e.g.*, *Carolina Envtl. Study Grp. v. U.S.*, 510 F.2d 796, 799 (D.C. Cir. 1975). An agency may find no significant impact if the probability is so low as to be "remote and speculative," or if the combination of probability and harm is sufficiently minimal. *See, e.g.*, *City of New York v. Dep't of Transp.*, 715 F.2d 732, 738 (2d Cir. 1983) ("The concept of overall risk incorporates the significance of possible adverse consequences discounted by the improbability of their occurrence."). Here, a "reasonable assurance" that permanent storage will be available is a far cry

from finding the likelihood of nonavailability to be "remote and speculative." The Commission failed to examine the environmental consequences of failing to establish a repository when one is needed.

The Commission argues that its "Table S-3" already accounts for the environmental effects of the nuclear fuel cycle and finds no significant impact. Not so. Table S-3, like the Commission itself, presumes the existence of a geologic repository. Therefore, it cannot explain the environmental effects of a failure to secure a permanent facility. The Commission also complains that conducting a full analysis regarding permanent storage would be an "abstract exercise." Perhaps the Commission thinks so because it perceives the required analysis to be of the effects of the permanent repository itself. But we are focused on the effects of a *failure* to secure permanent storage. The Commission apparently has no long-term plan other than hoping for a geologic repository. If the government continues to fail in its quest to establish one, then SNF will seemingly be stored on site at nuclear plants on a permanent basis. The Commission can and must assess the potential environmental effects of such a failure.

IV. Temporary On-Site Storage of SNF

In concluding that SNF can safely be stored in on-site storage pools for a period of sixty years after the end of a plant's life, instead of thirty, the Commission conducted what it purports to be an EA, which found that extending the time for storage would have no significant environmental impact. *See* Waste Confidence Decision Update, 75 Fed. Reg. at 81,074. This analysis was conducted in generic fashion by looking to environmental risks across the board at nuclear plants, rather than by conducting a site-by-site analysis of each specific nuclear plant. Two key risks the Commission examined in its

EA were the risk of environmental harm due to pool leakage and the risk of a fire resulting from the fuel rods becoming exposed to air. *See id.* at 81,069–71. We conclude that the Commission's EA and resulting FONSI are not supported by substantial evidence on the record because the Commission failed to properly examine the risk of leaks in a forward-looking fashion and failed to examine the potential consequences of pool fires.

A.

Petitioners challenge the finding of no significant impact on two bases: First, petitioners argue that a generic analysis is simply inappropriate and that the Commission was required to look at each plant individually. A site-by-site analysis is necessary, petitioners argue, because the risks of leaks and fires are affected by site-specific factors such as pool configuration, leak detection systems, the nature of SNF stored in the pool, and the location of the pool within the plant. Overall, petitioners argue that NEPA requires the Commission to fully analyze the environmental effects of on-site storage, and a generic analysis cannot fulfill that statutory mandate.

Second, petitioners argue that even if generic analysis is appropriate, the Commission's generic EA in this case was insufficient. They maintain that the Commission did not adequately account for leaks from on-site pools because the Commission only looked at past leaks to see if they caused environmental damage, rather than examining the risks of future leaks. Also, as petitioners point out, the Commission's own studies have shown that previous leaks "did, or potentially could, impact ground-water resources relative to established EPA drinking water standards." NRC, *Liquid Radioactive Release Lessons Learned Task Force Final Report* 13 (2006). Petitioners also argue that the Commission's analysis of the

effects of pool fires was deficient because the Commission declined to examine the consequences of pool fires due to the low probability of such an occurrence. In petitioners' view, the Commission could only avoid examining the consequences of pool fires in a full EIS if it found the risk so low as to be "remote and speculative"—a finding the Commission did not make. Finally, Petitioners contend that the Commission completely failed to look at non-health environmental factors such as effects on the Prairie Island Indian Community's homeland, which is located near one of the plants governed by the rule.

The Commission responds by stating that its examination of past leaks properly demonstrated that the potential for environmental harm from leakage is negligible. The Commission argues that the effects of past leaks have been shown to be quite minimal, and the Commission's leakage task force has recommended twenty-six specific measures to minimize the risk even further. Also, the NRC exercises oversight over the pools and will ensure that they do not become unsafe over the sixty-year period. With regard to fires, the Commission contends that it engaged in an "exhaustive consideration" of the risk and found that such an event is extremely unlikely. In the Commission's view, a site-by-site analysis of pool-fire risk is unnecessary because the Commission relied on studies which accounted for all of the variations cited by petitioners and essentially looked at the most dangerous combinations of site-specific factors. Even looking to a worst-case scenario, the Commission says, the risk of fires was still extremely low.

Responding to petitioners' argument that the Commission failed to determine that the risk of fires was "remote and speculative," the Commission suggests that it did not dismiss the risk out of hand as "remote and speculative" but rather examined

it thoroughly and found it to be so low that the consequences could not possibly overcome the low probability. Therefore, the Commission did not need to conduct a full EIS for pool fires. Finally, the Commission argues that petitioners did not raise the issue of non-health impacts during the rulemaking, and thus they cannot raise that issue on petition now.

B.

Both the Supreme Court and this court have endorsed the Commission's longstanding practice of considering environmental issues through general rulemaking in appropriate circumstances. *See, e.g.*, *Baltimore Gas*, 462 U.S. at 100 ("The generic method chosen by the agency is clearly an appropriate method of conducting the hard look required by NEPA."); *see also Minnesota*, 602 F.2d at 416–17. Though *Baltimore Gas* dealt with the nuclear fuel cycle itself, which is generally focused on things that occur outside of individual plants, we see no reason that a comprehensive general analysis would be insufficient to examine on-site risks that are essentially common to all plants. This is particularly true given the Commission's use of conservative bounding assumptions and the opportunity for concerned parties to raise site-specific differences at the time of a specific site's licensing. Nonetheless, whether the analysis is generic or site-by-site, it must be thorough and comprehensive. Even though the Commission's application of its technical expertise demands the "most deferential" treatment by the courts, *Baltimore Gas*, 462 U.S. at 103, we conclude that the Commission has failed to conduct a thorough enough analysis here to merit our deference.

1.

The Commission admits in the WCD Update that there have been "several incidents of groundwater contamination

originating from leaking reactor spent fuel pools and associated structures." 75 Fed. Reg. at 81,070. The Commission brushes away that concern by stating that the past leaks had only a negligible near-term health impact. *Id.* at 81,071. Even setting aside the fact that near-term health effects are not the only type of environmental impacts, the harm from past leaks—without more—tells us very little about the potential for future leaks or the harm such leaks might portend. The WCD Update seeks to extend the period of time for which pools are considered safe for storage; therefore, a proper analysis of the risks would necessarily look *forward* to examine the effects of the additional time in storage, as well as examining past leaks in a manner that would allow the Commission to rule out the possibility that those leaks were only harmless because of site-specific factors or even sheer luck. The WCD Update has no analysis of those possibilities other than to say that past leaks had "negligible" near-term health effects. *Id.* A study of the impact of thirty additional years of SNF storage must actually concern itself with the extra years of storage.

The Commission also notes that a taskforce has made recommendations for improvements to spent-fuel pools, which the NRC "has addressed, or is in the process of addressing." *Id.* But those improvements are thus far untested, and we have no way of deferring to the Commission's conclusion that they will ensure the absence of environmental harm. Finally, the Commission refers to its monitoring and regulatory compliance program as a buffer against pool degradation. *Id.* That argument is even less availing because it amounts to a conclusion that leaks will not occur because the NRC is "on duty." With full credit to the Commission's considerable enforcement and inspection efforts, merely pointing to the compliance program is in no way sufficient to support a scientific finding that spent-fuel pools will not cause a significant environment impact during the extended storage

period. This is particularly true when the period of time covered by the Commission's predictions may extend to nearly a century for some facilities.

Despite giving our "most deferential" treatment to the Commission's application of its technical and scientific expertise, we cannot reconcile a finding that past leaks have been harmless with a conclusion that future leaks at all sites will be harmless as well. The Commission's task here was to determine whether the pools could be considered safe for an additional thirty years in the future. That past leaks have not been harmful with respect to groundwater does not speak to whether and how future leaks might occur, and what the effects of those leaks might be. The Commission's analysis of leaks, therefore, was insufficient.

2.

Even though the Commission engaged in a more substantial analysis of fires than it did of leaks, that analysis is plagued by a failure to examine the consequences of pool fires in addition to the probabilities. Petitioners, citing *Limerick Ecology Action, Inc. v. Nuclear Regulatory Commission*, 869 F.2d 719, 739 (3d Cir. 1989), argue that the Commission could only avoid conducting an EIS if it found the risk of fires to be "remote and speculative." The Commission, citing *Carolina Environmental Study Group v. United States*, 510 F.2d at 799, argues that it did not need to examine the consequences of fires because it found the risk of fires to be very low.

We disagree with both parties. As should be clear by this point in our opinion, an agency conducting an EA generally must examine both the probability of a given harm occurring *and* the consequences of that harm if it does occur. Only if the harm in question is so "remote and speculative" as to reduce the

effective probability of its occurrence to zero may the agency dispense with the consequences portion of the analysis. *See Limerick Ecology Action, Inc.*, 869 F.2d at 739. But, contra petitioners, the finding that the probability of a given harm is nonzero does not, by itself, mandate an EIS: after the agency examines the consequences of the harm in proportion to the likelihood of its occurrence, the overall expected harm could still be insignificant and thus could support a FONSI. *See Carolina Envtl. Study Grp.*, 510 F.2d at 799 ("Recognition of the minimal probability of such an event is not equatable with nonrecognition of its consequences."). Here, however, the Commission did not undertake to examine the consequences of pool fires at all. Depending on the weighing of the probability and the consequences, an EIS may or may not be required, and such a determination would merit considerable deference. *C.f.*, *City of New York*, 715 F.2d at 751–52 (deferring to an agency's weighing of a "catastrophic" harm against an "infinitesimal probability"). But unless the risk is "remote and speculative," the Commission must put the weights on both sides of the scale before it can make a determination.

3.

As for petitioners' remaining argument that the Commission did not consider non-health environmental effects, we agree with the Commission that petitioners did not properly raise those issues in the rulemaking. Petitioners essentially present two non-health impacts: decrease in property values and risk of harm to the Prairie Island Indian Community's homeland. The Tribe did mention its small size and close proximity to the Prairie Island Nuclear Generating Plant, but it did not assert specifically how it might be harmed by either the rulemaking itself or the licensing the rulemaking enables. With regard to property values, petitioners point to a study considering the economic impact of the Indian Point plant. But that study actually

assumes a diminution in values caused by current plant operation and simply extends it mathematically—it in no way asserts whether or how any harm to property values might occur nor how that harm is related to a change in the physical environment. Petitioners' failure to raise these objections to the agency waives them. *See Public Citizen*, 541 U.S. at 764. We note, as did the Supreme Court in *Public Citizen*, that primary responsibility for compliance with NEPA lies with the Commission, not petitioners; nonetheless, the non-health effects alluded to here are not "so obvious that there is no need for a commentator to point them out." *Id.* Given, however, that we are invalidating the Commission's conclusions as a whole, petitioners will have the opportunity to properly raise and clarify these concerns on remand.

* * *

Overall, we cannot defer to the Commission's conclusions regarding temporary storage because the Commission did not conduct a sufficient analysis of the environmental risks. In so holding, we do not require, as petitioners would prefer, that the Commission examine each site individually. However, a generic analysis must be forward looking and have enough breadth to support the Commission's conclusions. Furthermore, as NEPA requires, the Commission must conduct a true EA regarding the extension of temporary storage. Such an analysis must, unless it finds the probability of a given risk to be effectively zero, account for the consequences of each risk. On remand, the Commission will have the opportunity to conduct exactly such an analysis.

V. Conclusion

We recognize that the Commission is in a difficult position given the political problems concerning the storage of spent

nuclear fuel. Nonetheless, the Commission's obligations under NEPA require a more thorough analysis than provided for in the WCD Update. We note that the Commission is currently conducting an EIS regarding the environmental impacts of SNF storage beyond the sixty-year post-license period at issue in this case, and some or all of the problems here may be addressed in such a rulemaking. In any event, we grant the petitions for review, vacate the WCD Update and TSR, and remand for further proceedings consistent with this opinion.

So ordered.

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June 8, 2012

Re: May 22, 2012 Nevada Commission on Nuclear Projects letter to the Nevada Congressional Delegation

Senator Reid
Senator Heller
Congresswoman Berkley
Congressman Heck
Congressman Amodei

Each of you recently received the subject letter from Richard H. Bryan, chairman of the State of Nevada Commission on Nuclear Projects. It transmitted an article from the Journal of Radiological Protection, written by Dr. M. C. Thorne, a technical advisor to the State of Nevada.

Chairman Bryan notes that the article: (1) *"...refutes the argument, repeatedly advanced by Yucca Mountain proponents, that Nevada's opposition is based purely on politics and irrational fears"*; (2) argues *"...that no other repository program in the world is developing a site with the unfavorable conditions present at Yucca Mountain"*; and (3) concludes that *"Yucca Mountain is an unsuitable and unsafe site...."* Nye County takes exception to each of these points.

Based on a review of Dr. Thorne's article by Nye County Nuclear Waste Repository Project Office technical staff, a critique that refutes Dr. Thorne's assertions has been prepared, and a copy is attached. It is important that you understand that there are credible technical arguments that refute Dr. Thorne's position. The Nuclear Regulatory Commission review of the Yucca Mountain License application is currently suspended; if and when it restarts, it will address Dr. Thorne's assertions, which are at the core of Nevada's contentions to the license application.

We would welcome an opportunity to discuss any of these issues with you at a time and place of your convenience. Our point of contact for these matters is Mr. Darrell Lacy, Director, Nye County Nuclear Waste Repository Office; email; llacy@co.nye.nv.us, phone: (775) 727-7727.

Sincerely,

Lorinda A Wichman

Lorinda Wichman, Chair
Nye County Board of County Commissioners

Attachment: Nye County Critique of the paper, *Is Yucca Mountain a Long-Term Solution for Disposing of U.S. Spent Nuclear Fuel and High-Level Radioactive Waste?*, by M.C. Thorne, June 2012

CC: Nevada Commission on Nuclear Projects
Nye County Board of County Commissioners
Nye County Manager
Nye County NWRPO

A Critique of the paper by M.C. Thorne, *Is Yucca Mountain a Long-Term Solution for Disposing of U.S. Spent Nuclear Fuel and High-Level Radioactive Waste?*

The paper, *Is Yucca Mountain a Long-Term Solution for Disposing of U.S. Spent Nuclear Fuel and High-Level Radioactive Waste?*, by M.C. Thorne, published in the Journal of Radiological Protection, volume 32 (2012) pages 175 to 180, presents once again the State of Nevada's arguments about the adequacy of the Yucca Mountain site. This time, they are presented in the context of assumptions that do not recognize the need to change the Nuclear Waste Policy Act to implement the recommendations of the Blue Ribbon Commission. The paper is similar to other presentations that Dr. Thorne has given in that it questions whether or not an adequate post closure safety case can be developed for the Yucca Mountain facility. He questions why an unsaturated environment should be preferred over other geological contexts that exist in the U.S., and that are more akin to those being studied and developed in other countries. As is the case with much of the criticism of the Yucca Mountain project that comes from European scientists, there is a complete lack of appreciation for the intent of the Nuclear Regulatory Commission regulations, whether 10 CFR part 63 which was developed specifically for Yucca Mountain, or 10 CFR part 60 which is generically applicable.

Thorne's perspective on the Blue Ribbon Commission report is that the existing waste management programs in the United States are tied to the fate of the Yucca Mountain site, which is described as having been troubled for decades and is now almost entirely broken down. That premise is inconsistent with statements in the Blue Ribbon Commission report, ("*We recognize 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*" p. xii) added subsequent to the draft version of the report, that acknowledged that the Yucca Mountain site is the existing law of the land. In that context, the Commission's report ought to be viewed as focusing as much on the development of a second repository as in eliminating the Yucca Mountain repository from consideration.

In describing the implementation of the Blue Ribbon Commission's recommendations, Thorne argues that under the recommendations the host state and affected tribal and local governments would all have had to agree to the terms of the site study and what was to be built prior to the submission of a license application. When the studies were complete, a license application would be prepared, and the Blue Ribbon Commission recommendations are interpreted as recommending that the host state and affected tribal local government should be given the opportunity to sign off on it before submittal. While that may be an appropriate interpretation of the Blue Ribbon Commission recommendations, it is completely inconsistent with the policy developed in the Nuclear Waste Policy Act. Examination of the history of the development of the Act indicates that Congress was quite sensitive to the issue of state vetoes, and addressed it not by allowing state intervention at the time of the license application submittal, but rather, allowing the state to submit a notice of disapproval, at the time the site recommendation, which would then have to he overridden by both houses of Congress. A more appropriate interpretation of the Nuclear Waste Policy Act is that while the state and affected unit of local government would be given an opportunity to participate in a licensing hearing, neither would be given veto authority.

Thorne also believes that the Nuclear Waste Policy Act Amendment of 1987 was predicated upon a deteriorating political situation in a growing recognition that the original timeline set up in the Nuclear Waste Policy Act, and the associated costs assumptions were unrealistic. It is inappropriate to refer to the Congress's concern with the increasing costs of the program as a deteriorating political situation. Most of Thorne's paper is devoted to his assessment of the technical adequacy of the Yucca mountain site. The argument starts with a premise, notably, *"Worldwide, there is broad agreement that deep geological disposal is the preferred option for spent fuel and high-level waste disposal, with the intent being that the geological environment will provide long-term protection of the waste packages from degradation, and will limit the transport of radionuclides to the human environment in the event of container failure."* That premise is inconsistent with the Nuclear Waste Policy Act and the Nuclear Regulatory Commission regulations. In fact, when raised in the United States Court of Appeals for the District Of Columbia Circuit by the state of Nevada at the time of the site recommendation lawsuits, it was found to not have merit. Furthermore, Thorne contradicts his own premise by noting that, for example, in Sweden and Finland, their proposal is to dispose of spent fuel in copper canisters in a geological environment in which significant degradation of the packages would not be expected on a time scale of 1 million years or longer. In other words, total reliance on the engineered barriers system and not the geological system. While the thrust of his arguments are against disposal in a unsaturated zone site, his conclusion that a typically suitable repository environment for disposal displays properties such as long-term (millions of years) geological stability and low groundwater content and flow at repository depths is not an argument against an unsaturated zone disposal site.

It is interesting that the argument for long-term stability of a geologic repository uses Sweden as an example. Mörner, (Mörner, Nils-Axel, 2001, *In absurdum: Long-term predictions and nuclear waste handling,* Engineering Geology, v 61, pp 75-82) has noted that while the Fennoscandian Shield has been claimed to offer exceptionally stable bedrock conditions over immense time periods, the last deglacial phase, some 10,000 years ago, had a totally different situation from that of today. He notes that at that time, Sweden (Fennoscandia) was a high seismic area, due to exceptionally high rates of uplift, was characterized by exceptionally high seismic activity in both amplitude and frequency, and that those conditions will be repeated in future Ice Ages. He regards this "super seismicity" as a characteristic phenomenon of deglaciation deformation and probably glaciation deformation as well. He concludes that in such an environment the Fennoscandian bedrock cannot offer any safe repository for periods entering into and passing through a future Ice. In the absence of true long-term safety for a repository in bedrock he recommends utilization of a dry rock deposit method. The dry rock deposit method refers to an artificially drained bedrock repository, where the waste is placed under constant control, and where it remains accessible, stored in the bedrock under dry conditions, under constant control and monitoring, accessible for maintenance and possible future methods of rendering the waste harmless and even removal.

What is most interesting about this concept is that the solution is to create, artificially in the Swedish bedrock, that which exists naturally at Yucca Mountain.

Building from the state's argument the geology is to be the principal barrier, Thorne refers to the state of Nevada tests at Catholic University to conclude that it has been demonstrated experimentally that the waste package materials could not maintain their physical integrity in the environment that would be present in a repository at Yucca Mountain. The presentation of those results to independent experts by the state of Nevada did not result in the same conclusions that Thorne draws in his paper.

Thorne concludes that the fundamental problem with the Yucca Mountain facility is its position above the water table, where he believes infiltrating water would be rendered corrosive and aggressive to the waste containers by the water rock reaction that would occur at the high temperatures projected in the vicinity of the repository. This avoids the obvious facts that when the temperatures are high, the water would be diverted away from the repository, and if the rock is as freely draining as he assumes, the water would not be sitting above the repository as the wastes cool. Incidentally, the full-scale heater tests conducted in the Exploratory Studies Facility showed that water did not pond above the experiment room. Rather, the water drained to the side of the heated rock zone, an attribute that is relied on in the Yucca Mountain repository safety assessments and implemented in the design by limiting mid-pillar temperatures

To Thorne, the fact that no other countries propose to locate a repository above the water table means that the issues that face the Yucca Mountain project are not being addressed by research and development activities elsewhere in the world. This does not make them technically incorrect or weak. The U.S. approach to looking at potential repository sites in the unsaturated zone began with U.S. Geological Survey suggestions that disposal in the unsaturated zone would offer advantages in deep geologic disposal of high-activity waste, the thought being that a site with limited water flux downward would be a benefit to repository performance (see, for example, Roseboom, Eugene H. Jr. 1983, *Disposal of High-Level Nuclear Waste Above the Water Table in Arid Regions* U.S. Geological Survey Circular 903, or earlier papers by I.J. Winograd). The deep water table and thick unsaturated zone at Yucca Mountain were thought to be indications of a very low infiltration rate and therefore a negligible downward flux; advective transport by water was, and still is, considered the most serious threat to mobilizing nuclear waste. Whether or not the Department of Energy ended up taking credit for all of them in the license application, the fact remains that U. S. Geological Survey scientists identified multiple natural barriers in the unsaturated zone, including low flux, high transmissivities, the presence of zeolite minerals, and air circulation through the unsaturated zone. The Nuclear Regulatory Commission regulations allow the applicant to determine those barriers upon which reliance for performance is based; there is no requirement placed on any single barrier.

The U.S. Nuclear Waste Technical Review Board, in their 2011 report, *Technical Advancements and Issues Associated with the Permanent Disposal of High-Activity Wastes: Lessons Learned from Yucca Mountain and Other Programs*, was unequivocal in their endorsement of the unsaturated zone as a suitable medium for geologic disposal. They noted (page iii): "*[c]onsiderable methodology and evidence have been developed to indicate the technical feasibility of isolating nuclear waste in an unsaturated zone of the subsurface that involves an oxidizing environment, thus expanding the options for siting a repository.*" They further note (page 69) that the "*Yucca Mountain program has contributed significantly to the technical knowledge base for developing a geologic disposal facility for high-activity waste,*" that "...

major advances were made in assessing the performance of engineered barriers and the natural system associated with geologic disposal," and that *"[a]dvances were made in modeling water flow in unsaturated fractured rock in semiarid zones, understanding the role of matrix diffusion in transporting radionuclides, and using analog information as evidence for assessing hydrogeologic behavior of geologic units."* They concluded that the *"Yucca Mountain program developed considerable data, methodology, and evidence to indicate the technical feasibility of isolating high-activity waste in an unsaturated, oxidizing environment."*

Thorne's conclusion that the safety analysis conducted by the Department of Energy has shown that without the additional protection of the titanium trip shields, disposal of the waste package in the proposed repository design for Yucca Mountain would give rise to radiation doses to members of the local population far in excess of the federal standard for Yucca Mountain repository, appears to be derived from analyses presented by Gilinsky; one is based on a neutralization analysis presented in the TSPA-SR, which was driven by admittedly unrealistic climate scenarios, and the other was a calculation using probabilistic results supporting the license application that was applied inappropriately. Specifically, releases in the Yucca Mountain safety assessment depend upon an assumption of infiltrating water contacting the most susceptible waste package and forcing that package failure to immediately release radionuclide content. What Gilinsky did was take probabilistic aspects of this problem and treat them as a worst case deterministic problem. The license application calculation hinges on an assumed number of fast paths; the probability of a fast pathway intersecting each waste package is very low. The probability of each waste package being the worst case for release (it is actually the high-level radioactive waste packages that lead to the worst case releases for early failure) is also low. Rather than treating the problem as a conditional probability, Gilinsky appears to have simply multiplied the number of waste packages by the release from a single failed waste package to arrive at the number Thorne is referring to here.

Thorne next turns to the issue of drip shield installation and presents the state of Nevada argument that it is unlikely that a comprehensive installation of the drip shields could be achieved even if the political will to undertake that installation could be relied upon. Thorne argues that it is surely not acceptable to base public safety of such a technically risky and politically uncertain proposition. This is an example of turning a technical issue into a sociopolitical issue. It is literally no different from arguing that future societies might chose to not fund performance confirmation monitoring (or, more to the point, to leave nuclear waste sitting at reactor sites in spite of a legal policy and contracts for the government to remove the wastes)

Thorne's principal conclusion begins with the statement that the problems in developing a safety case for Yucca Mountain have arisen essentially from selection of an inappropriate site and an invalid disposal concept. Thorne's argument that the large quantities of water that are in the unsaturated rock at Yucca Mountain can percolate rapidly downward to the saturated zone is totally inconsistent with the scientific evidence developed for the Yucca Mountain license application. His argument that the downward seeping water would enter the hot oxidizing environment of the waste tunnels and there promote rapid waste package corrosion, waste dissolution, and the migration of radionuclides to a major aquifer to an unacceptable degree is not proven by any scientific basis known to have presented by the state of Nevada. It is

predicated on assumptions, such as those found in the state of Nevada's contentions, which have not received technical peer acceptance in having technical merit; that lack of acceptance is due in large part to the state of Nevada not presenting credible technical analyses and publications to support their arguments.

While it is true that no other country is considering a repository with temperatures as high as those proposed for Yucca mountain, Thorne's argument neglects the facts of the higher relative amounts of wastes to be disposed at the U.S. repository site, the lack of a U.S. commitment to reprocessing, which would result in the disposal of high-level waste rather than spent nuclear fuel, and the fact that the U.S. policy has consistently avoided a long-term interim storage program. Those three conditions are so different from those being faced by any other country that it is completely inappropriate to try to compare the disposal approaches developed in the U.S. to those developed elsewhere. Thorne makes much of an International Atomic Energy Agency position on multi-barrier systems, but completely ignores the existing regulations in the United States. The U.S. regulations do not require complete reliance on the natural barrier system, nor do they specify what relative amounts of reliance should be placed on individual barriers, nor do they require a strict defense in depth argument. Rather, the risk-informed , probability-based nature of the high-level radioactive waste regulations of the U.S., which differ significantly from anything proposed anywhere else in the world, allow the applicant to demonstrate technically how the site will perform, including an analysis of the uncertainties associated with that calculation. Thorne's argument that the scientific and technical basis of the technical calculations supporting the Department of Energy license application are in question is of course correct; that is the purpose of the licensing hearing to be held following completion of the Safety Evaluation Report by the Nuclear Regulatory Commission staff.

The argument that three independent panels of Nuclear Regulatory Commission administrative hearing judges accepted over 300 potential safety, environmental, and legal the contentions from intervening parties that raised issues is specious at best, given that the Nuclear Regulatory Commission staff did not recognize sufficient technical merit in these contentions and had recommended against their adoption.

Thorne concludes by arguing that to date some $9 billion has been expended investigating the Yucca Mountain site and in developing a grossly inadequate license application that the U.S. administration is seeking to withdraw. First, there is no basis for the assumption that the license application is grossly inadequate. Conversely, all evidence points otherwise. The nature of the draft Safety Evaluation Report, as reflected in the Technical Evaluation Report published by the Nuclear Regulatory Commission staff, and the report of the House Committee on Science, Space, and Technology, which reviewed an unredacted copy of the draft Safety Evaluation Report, strongly support a conclusion that the Nuclear Regulatory Commission staff was prepared to go to the licensing hearings. As to the U.S. Administration seeking to withdraw the license application, it is clear that was politically motivated. In response to a challenge by Congress to provide technical evidence that the site was in fact unsuitable, the Secretary was unable to do so. It would seem that if the state of Nevada, supporting the Department of Energy's effort to withdraw the license application, had technical information that would have substantiated arguments of the supposed inadequacy of the license application they should have been brought forward at that time and given to Congress.

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OPINION

Is Yucca Mountain a long-term solution for disposing of US spent nuclear fuel and high-level radioactive waste?

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Abstract

On 26 January 2012, the Blue Ribbon Commission on America's Nuclear Future released a report addressing, amongst other matters, options for the managing and disposal of high-level waste and spent fuel. The Blue Ribbon Commission was not chartered as a siting commission. Accordingly, it did not evaluate Yucca Mountain or any other location as a potential site for the storage or disposal of spent nuclear fuel and high-level waste. Nevertheless, if the Commission's recommendations are followed, it is clear that any future proposals to develop a repository at Yucca Mountain would require an extended period of consultation with local communities, tribes and the State of Nevada. Furthermore, there would be a need to develop generally applicable regulations for disposal of spent fuel and high-level radioactive waste, so that the Yucca Mountain site could be properly compared with alternative sites that would be expected to be identified in the initial phase of the site-selection process. Based on what is now known of the conditions existing at Yucca Mountain and the large number of safety, environmental and legal issues that have been raised in relation to the DOE Licence Application, it is suggested that it would be imprudent to include Yucca Mountain in a list of candidate sites for future evaluation in a consent-based process for site selection. Even if there were a desire at the local, tribal and state levels to act as hosts for such a repository, there would be enormous difficulties in attempting to develop an adequate post-closure safety case for such a facility, and in showing why this unsaturated environment should be preferred over other geological contexts that exist in the USA and that are more akin to those being studied and developed in other countries.

[1] Technical advisor to the State of Nevada.

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1. The Report of the Blue Ribbon Commission

Two years ago, the US Secretary of Energy charged the Blue Ribbon Commission on America's Nuclear Futnre with reviewing policies for managing the back end of the nuclear fuel cycle and recommending a new plan. On 26 January 2012, the Commission fulfilled its duties with the release of a report [1] that includes recommendations covering topics such as the approach to siting future nuclear waste management facilities, the transport and storage of spent fnel and high-level waste, options for waste disposal, institntional arrangements for managing spent nuclear fuel and high-level wastes, reactor and fuel cycle technologies, and international considerations. The report also includes recommendations regarding critical changes needed in the handling of nuclear waste fees and of the Nuclear Waste Fund.

With respect to the existing waste management programme in the USA, the Blue Ribbon Commission report is forthright. That policy, which tied the entire US high-level waste management programme to the fate of the Yucca Mountain site, is described as having been troubled for decades and now to be almost entirely broken down. The report recommends a new approach that involves development of one or more geological repositories as the preferred option for disposal of spent nuclear fuel and high-level waste, coupled with the development of one or more consolidated interim storage facilities. In this new approach, site selection would be through a consent-based process involving local, tribal and state levels of government. Specifically, the Commission considers that 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 licence application. When studies were complete, a licence 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. This process is in strong contrast with the approach through which the Yucca Mountain site was selected. That process was initiated through the Nuclear Waste Policy Act (NWPA) of 1982 which provided for the selection of two repository sites and led, in 1986, to the Energy Secretary making the recommendation that the Hanford site in Washington State, Deaf Smith County in Texas, and Yucca Mountain in Nevada should be subject to detailed site characterisation as leading candidates for the first permanent high-level geologic waste repository. However, faced with a deteriorating political situation and growing recognition that the original timelines set out in the NWPA and the associated cost assumptions were unrealistic, Congress revisited the issue of nuclear waste management in 1987. The resulting NWPA Amendments Act of 1987 halted then ongoing research in crystalline rock of the type found in the Midwest and along the Atlantic coast, cancelled the second repository programme, nullified the selection of Oak Ridge, Tennessee as a potential interim waste storage site, and designated Yucca Mountain as the sole site to be considered for a permanent geologic repository. The decision was widely viewed as political and it provoked strong opposition in Nevada, where the 1987 legislation came to be known as the 'Screw Nevada' bill [1].

Anger at the politically motivated selection of Yucca Mountain in 1987 was increased by a new approach to regulation of Yucca Mountain imposed by Congress and subsequently adopted by the US Environmental Protection Agency (EPA) and Nuclear Regulatory Commission (NRC). This has resulted in there currently being two sets of federal regulatory standards for high-level radioactive waste disposal facilities—one set that was developed specifically for Yucca Mountain and another, earlier set that would, under current law, apply to all other sites. As the Commission comments [1, section 10.3], while there may be advantages to

developing standards and requirements that recognise the specific features and characteristics of a particular site, experience with Yucca Mountain indicates that this approach can create suspicions that regulations are being tailored to make a pre-selected site 'work'. The Commission considers that generally applicable regulations are more likely to earn public confidence and that a generic standard will also support the efficient consideration of multiple sites. The difficulties arising when standards are developed in a site-specific context is well illustrated by the chequered history of standards developed for Yucca Mountain. The process, which was initiated by the Energy Policy Act of 1992, involved a study by the National Academy of Sciences, multiple lawsuits, and another court remand that required EPA to reconsider certain provisions it had initially proposed. Thus, it was not completed until 2008 for the EPA rule and 2009 for the associated NRC rule, and still resulted in standards that were regarded, by some parties, as biased in favour of the Department of Energy's (DOE's) Yucca Mountain licencing case.

What then of the current status of Yucca Mountain as a potential location for the disposal of US commercial and naval spent fuel and high-level waste? The Blue Ribbon Commissiou makes it clear that it was not chartered as a siting commission. Accordingly, it did not evaluate Yucca Mountain or any other location as a potential site for the storage or disposal of spent nuclear fuel and high-level waste, nor did it take a position on the Administration's request to withdraw the licence application (a request that remains subject to legal challenge). Nevertheless, if the Commission's recommendations are followed, it is clear that any future proposals to develop a repository at Yucca Mountain would require an extended period of consultation with local communities, tribes and the State of Nevada. Furthermore, there would be a need to develop generally applicable regulations for disposal of spent fuel and high-level radioactive waste, so that the Yucca Mountain site could be properly compared with alternative sites that would be expected to be identified in the initial phase of the site-selection process.

2. The technical adequacy of Yucca Mountain

How would Yucca Mountain fare in such an evaluation, taking iuto account the expectations that have developed as to the requirements that should be placed on the performance of such a disposal facility? Worldwide, there is broad agreement that deep geological disposal is the preferred option for spent fuel and high-level waste disposal, with the intent being that the geological environment will provide long-term protection of the waste packages from degradation, and will limit the transport of radionuclides to the human environment in the event of container failure. Thus, for example, in Sweden and Finland, the proposal is to dispose of spent fuel in copper canisters in a geological environment in which significant degradation of the packages would not be expected on a timescale of one million years or longer (see, e.g. [2]). Typically, a suitable environment for deep disposal would display properties such as long-term (millions of years) geological stability, low groundwater content and flow at repository depths, stable geochemical or hydrochemical conditions at depth, mainly described by a reducing environment and a composition controlled by equilibrium between water and rock-forming minerals, and good engineering properties that readily allow construction and operation of the repository [3].

In contrast, the relatively young and volcanically active geological environment at Yucca Mountain does not contribute positively to the protection of the waste packages against degradation and would do little to limit the transport of radionuclides from those packages once they had degraded. Thus, the DOE has to argue for the long-term safety of the proposed facility based on projection of the performance of complex engineered materials and structures over

timescales of thousands to tens of thousands of years [4][2]. In contrast, the materials that they rely on have been used for engineering purposes only for, at most, a few decades. Furthermore, although resistant to degradation in some contexts, it has been demonstrated experimentally that these materials would not maintain their physical integrity in the environment that would be present in a repository at Yucca Mountain [5, see NEV-SAFETY-106][3].

A fundamental problem with the proposed Yucca Mountain facility is that it is positioned above the water table in a location where infiltrating water would be rendered corrosively aggressive to the waste containers by the water–rock reactions that would occur at the high temperatures projected in the vicinity of the repository. No other country is proposing to locate a spent fuel or high-level waste repository above the water table [3, section 4.6], so the coupled hydro-thermo-geochemical problems that arise are unique to the Yucca Mountain context and are not being addressed by research and development activities elsewhere in the world. Safety analyses conducted by the DOE have shown that without the additional protection of titanium drip shields (see below) disposal of waste packages of the proposed design at Yucca Mountain would give rise to radiation doses to members of the local population far in excess of the Federal Standard set for a Yucca Mountain repository by the EPA to protect public health. Furthermore, this situation is projected to occur within a few hundred years of repository closure, since groundwater transit times are short and the DOE takes no credit for waste canister performance in its safety assessment.

Faced with this fundamental obstacle to demonstrating the safety of the proposed repository, the DOE Licence Application [4] introduced an additional design feature. It posited the existence of titanium alloy 'drip shields', one 5 ton drip shield over each of the 11 500 waste packages, to ward off the corrosion-promoting water. However, these extremely expensive drip shields are not part of the current waste installation plan, but are intended to be installed by a yet-to-be-designed, remote-controlled robotic mechanism about one hundred years after the wastes have been emplaced. Taking account of the high temperature (above boiling point), high radiation, physically degraded environment that would exist at that time, it seems unlikely that efficient and comprehensive installation of the drip shields could be achieved, even if the political will to undertake that installation could be relied upon. It is surely not acceptable to base public safety on such a technically risky and politically uncertain proposition.

The problems in developing a safety case for Yucca Mountain have arisen essentially from selection of an inappropriate site and an invalid disposal concept. Although located in a desert region, the unsaturated rock at Yucca Mountain contains large quantities of water that can percolate rapidly downward to the saturated zone, where it is then carried away horizontally towards the residential and agricultural area of Amargosa Valley. The downward seeping water would enter the hot, oxidising environment of the waste tunnels and there promote rapid waste package corrosion, waste dissolution and the migration of radionuclides to a major aquifer and hence to Amargosa Valley, contaminating groundwater resources there to an unacceptable degree. No other country is considering a repository attaining temperatures as high as those proposed at Yucca Mountain. Nor are other proposed repositories located in unsaturated, oxidising environments where reliance has to be placed entirely on the predicted performance of complex engineered materials and structures to achieve safety.

[2] See also: First Update to the Yucca Mountain Repository License Application (LA) for Construction Authorisation transmitted from the Office of Civilian Radioactive Waste Management, Department of Energy to the Office of Nuclear Material Safety and Safeguards, US Nuclear Regulatory Commission, February 2009.

[3] Individual contentions within this document are supported by references to underlying documents that were placed on the Licensing Support Network and are available from the State of Nevada Agency for Nuclear Projects, www.state.nv.us/nucwaste/. Responses to this Petition by DOE and NRC are also available, as is a rebuttal of those responses by the State of Nevada.

This heavy reliance on a single engineered barrier is inconsistent with international standards, because those standards include the requirement that the design should incorporate multiple barriers that act in concert, initially to contain the radionuclides, therefore allowing them to decay, and then to limit their releases to the accessible environment. A combination of engineered and geological barriers is generally known as a multi-barrier system and the IAEA considers that the geological formation in which the waste is emplaced, referred to as the 'host rock', generally constitutes the most important isolation barrier [3, Section 2.1], where isolation includes both protection of the engineered system from degradation and limitation of the migration of radionuclides if any degradation of that engineered system does occur. This concept of multiple barriers acting in concert is similar to the defence-in-depth approach that is a basic feature of nuclear power reactor safety as regulated by the NRC. Defence-in-depth does not exist in the proposed Yucca Mountain repository design, as compliance with Federal Safety Standards depends critically on the installation and performance of the drip shields, neither of which cau be assured at the time of licencing.

The foregoing general objections apply even if the results of calculations presented by the DOE in the Yucca Mountain Licence Application [4] are accepted. However, the scientific and technical bases of these calculations are open to question. Three independent panels of NRC judges comprised of lawyers and scientists have accepted contentions from intervening parties that the Licence Application raises approximately 300 significant safety, environmental and legal issues that would have to be fully adjudicated and satisfactorily resolved in a sequence of oral hearings before any licence could be issued. These issues include [5]:

- The appropriate representation of future climate in the area.
- The selection of models to characterise water flow.
- The chemical composition of the water that would contact the drip shields (if installed) and waste packages.
- The corrosion resistance and failure mechanisms of drip shields and waste packages.
- The sorption of radionuclides to minerals in the rock.
- The behaviour of radionuclides in the biosphere.

Further issues relate to vulnerabilities of surface facilities to military aircraft crashes and the overall vulnerability of the site to future volcanic events [5].

The unprecedented number, scope and technical depth of the admitted contentions relating to these issues suggests that, taken together, they could not all reasonably be expected to be resolved in favour of the proposed repository. In addition, even the evaluation of these issues through a sequence of hearings could be expected to be a very protracted undertaking, and would be likely to imply considerable expenditure of resources in performing additional scientific and technical studies to resolve the matters under dispute. Indeed, some of the matters raised could only be resolved by new field studies or by the development of complex new computational models. To date, some nine billion dollars have been expended in investigating the Yucca Mountain site and in developing a grossly inadequate licence application that the US Administration is seeking to withdraw. Therefore, it is suggested that it would be imprudent to include Yucca Mountain in a list of candidate sites for future evaluation in a consent-based process for site selection. Even if there were a desire at the local, tribal and state levels to act as hosts for such a repository, there would be enormous difficulties in attempting to develop an adequate post-closure safety case for such a facility, and in showing why this unsaturated environment should be preferred over other geological contexts that exist in the USA and that are more akin to those being studied and developed in other countries.

References

[1] Blue Ribbon Commission on America's Nuclear Future 2012 *Report to the Secretary of Energy* January 2012, available from www.brc.gov

[2] Svensk Kärnbränslehantering AB 2011 Long-term safety for the final repository for spent nuclear fuel at Forsmark *Main Report of the SR-Site Project Volumes I to III* (Stockholm: Swedish Nuclear Fuel and Waste Management Co.) SKB Report TR-11-01

[3] International Atomic Energy Agency 2003 *Scientific and Technical Basis for the Geological Disposal of Radioactive Wastes, IAEA Technical Reports Series No.* 413 (Vienna: International Atomic Energy Agency)

[4] US Department of Energy, Office of Civilian Radioactive Waste Management 2008 *Yucca Mountain Repository License Application, DOE/RW-0573* Rev. 0, June 2008

[5] State of Nevada 2008 *Petition to Intervene as a Full Party in the matter of US Department of Energy (High Level Waste Repository), Docket No. 63-001, December 2008*

NATIONAL CONFERENCE *of* STATE LEGISLATURES

The Forum for America's Ideas

June 21, 2012

The Honorable Harry Reid
Majority Leader
Capitol Building, S-221
Washington, DC 20510-7020

The Honorable Mitch McConnell
Minority Leader
Capitol Building, S-230
Washington, DC 20510-7010

Dear Senator Reid and Senator McConnell:

The National Conference of State Legislatures (NCSL) urges the Senate to support section 312 of the Energy and Water Development and Related Agencies Appropriations Act, 2013 (S. 2465), as reported by the Senate Appropriations Committee that would create a pilot program within the Department of Energy to license, construct, and operate consolidated interim storage facilities as needed for spent nuclear fuel and high level radioactive waste.

Additionally, NCSL urges that the siting of such facilities be the result of a consent based approach that involves all affected levels of government, including state legislatures. NCSL also supports use of the Nuclear Waste Fund to provide interim storage financing mechanisms and incentives to voluntary host communities.

Enactment of the pilot project will help advance national efforts to address spent fuel storage and high level radioactive waste management thereby ensuring that nuclear power remains an integral part of a national energy plan as long term storage plans are developed.

NCSL has a long history of working on issues related to nuclear waste management and welcomes the opportunity to work with Congress to continue to advance the conversation forward. Please feel free to contact NCSL staff Ben Husch (ben.husch@ncsl.org) or Tamra Spielvogel (tamra.spielvogel@ncsl.org) for more information.

Sincerely,

Senator Stephen R. Morris
Senate President, Kansas
President, NCSL

Delegate Sally Young Jameson
Maryland House of Delegates
Chair, NCSL Nuclear Legislative Workgroup

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Nye County

Nuclear Waste Repository Project Office

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12-075-DL (L)

June 25, 2012

Nye County, Nevada, Nuclear Waste Repository Project Office (NWRPO) Comments on NRC Draft Report for Public Comment, "*Identification and Prioritization of the Technical Information Needs Affecting Potential Regulation of Extended Storage and Transportation of Spent Nuclear Fuel, May 2012*"

Overarching Comments:

1. This plan is for a period many decades, and perhaps centuries, into the future. As such, it is inconsistent with a recent court ruling regarding the deficiency of the current Nuclear Regulatory Commission (NRC) waste confidence decision. The ruling states:

   "We further hold that the Commission's evaluation of the risks of spent nuclear fuel is deficient in two ways:

   - First, in concluding that permanent storage will be available "when necessary," the Commission did not calculate the environmental effects of failing to secure permanent storage—a possibility that cannot be ignored.
   - Second, in determining that spent fuel can safely be stored on site at nuclear plants for sixty years after the expiration of a plant's license, the Commission failed to properly examine future dangers and key consequences."

2. Current dry cask storage systems for used nuclear fuel are very large and will require repackaging for disposal. The Yucca Mountain disposal program was predicated on the disposal of very large containers, possible because of the unique capability of Yucca Mountain to allow emplacement of such containers via a gently sloping ramp under the mountain. The Yucca Mountain program also included large Transportation, Aging, and Disposal canisters (TADs) that could be direct disposed, but neither the current / planned inventory of large storage canisters or TADs will be directly disposable in any other repository than Yucca Mountain. This means that repackaging into much smaller canisters before disposal will be required.

   Because of this repackaging requirement, it is imperative that NRC maintain its requirement for the cladding integrity and retrievability of used fuel in storage canisters – especially since storage for more than 100 years and repackaging (perhaps multiple rounds of repackaging) will be required with the abandonment of the Federally mandated Yucca Mountain repository.

3. The Yucca Mountain Final Environmental Impact Statement included a no-action alternative that assumed repackaging of used fuel in dry storage would be required every 100 years if a repository was not available. Apparently, the NRC now believes such a no action scenario is foreseeable. In addition to the technical study of long-term extended storage, detailed technical and cost studies of

extended storage are necessary to provide necessary information to Congressional decision makers and other stakeholders. These studies of extended storage must analyze the cost and impacts of repackaging including worker exposure, disposal of used containers, etc. The acceptability of such costs and impacts should not be merely assumed.

Specific Comments:

1. p. iv, Executive Summary, paragraph 1 – This opening paragraph states the Commission is planning these technical studies "in expectation of continued use of dry storage for extended periods of time . . . over periods beyond 120 years." This has several direct unacceptable implications. First, this must mean that the Commission does not expect a nuclear waste repository to be available for at least 120 years. Without a repository, a logical conclusion that follows from this is that, the Commission does not have confidence that a repository will be available "when necessary" as stated in its most recent waste confidence decision. With the NRC abandoning the Yucca Mountain Repository licensing process, and absent Congressional direction on how to proceed, the Commission cannot possibly know what will happen to used nuclear fuel. Clearly this is an unacceptable set of circumstances.

2. p. iv, Executive Summary, paragraph 3 – This paragraph states the period of evaluation beyond 120 years could be up to 300 years. The statement is made that, "this period is defined for analytical purposes only, and does not imply that storage is anticipated for any particular period." The preceding statement is unbelievable. Clearly, the Commission believes storage for at least 120 years will be necessary or the proposed technical studies would not be necessary.

3. p. v, Executive Summary, list of assumptions – The assumptions listed are reasonable and the constraints assumed in the study should not be lessened, particularly in light of the fact that the ultimate disposition of used nuclear fuel is totally unknown. Specifically, the assumption should be retained that, "current regulatory requirements for cladding integrity and ready retrieval of spent nuclear fuel assemblies during storage apply for extended storage." Any exception to such requirements should only be considered if, as part of an ultimate disposal solution, cladding integrity and retrieval are not required. For example, the Transportation, Aging, and Disposal canisters (TADs) proposed for Yucca Mountain could be considered for such an exception because cladding integrity is not assumed and there is no intent to retrieve the fuel in the TADs before disposal emplacement.

4. p. 1-1, Introduction, Section 1.1, paragraph 2 – It is stated that the basis for the current licensing and safety findings regarding "low burnup SNF" are based on technical studies of 15-year-old low burnup fuel. The Commission's most recent waste confidence decision regarding the safe storage of SNF for at least 60 years beyond reactor operating life is purportedly based on these same studies. Nye County applauds the NRC for planning studies of higher burnup older used nuclear fuel because we view the current technical basis for the waste confidence finding as inadequate. Results of the planned studies should have been available before the current Commission declaration in that waste confidence finding.

5. p. 1-2, Section 1.2, last paragraph – It is stated, "In addition, the data will be used to support NRC evaluation of aging management plans provided by ISFSI licensees as part of applications for license renewal." This appears to be the real urgency for beginning the proposed technical studies within the next few years. The current Commission declaration

regarding safe storage for at least 60 years after reactor operating life needs a technical basis that does not yet exist. Otherwise, the results of the planned studies would not be necessary for many decades into the future and would not be necessary at all if a used fuel repository program is operating before then.

6. p. 1-2, Section 1.3, last paragraph on page – It is stated that, "...the staff is currently re-examining the role of cladding integrity and alternate design solutions in the licensing of storage casks as part of its ongoing efforts to re-examine the regulatory framework for extended storage and transportation." NWRPO urges the NRC to retain the current regulatory requirements for cladding integrity and retrieval. The only exception should be for implementation of a specific disposal option that does not require cladding integrity or retrieval from the storage canister.

7. Sections 3 and 4. NWRPO applauds the NRC staff in its thorough and well thought out prioritization of technical information needs. NWRPO offers no suggestions for improvement.

8. Section 5. Again, the NRC technical staff is to be applauded. NWRPO agrees with the NRC staff prioritization for further research regarding used nuclear fuel. The results will prove useful and necessary in determining whether storage licenses can be extended over the next 60 to 100 years. They may also be necessary if a used fuel disposition program is not in operation within the next 80 years.

9. Section 6. NWRPO agrees with the NRC staff conclusions except we believe the study results will be at least as useful to determining the safety of storage licenses over the next 100 years as they will be for longer periods.

Thank you,

Darrell Lacy, Director
Nye County NWRPO

STATE OF MAINE
OFFICE OF THE GOVERNOR
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AUGUSTA, MAINE
04333-0001

Paul R. LePage
GOVERNOR

28 June 2012

The Honorable Olympia Snowe
United States Senate
154 Russell Senate Office Building
Washington, D.C. 20510

The Honorable Susan Collins
United States Senate
413 Dirksen Senate Office Building
Washington, D.C. 20510

The Honorable Chellie Pingree
United States House of Representatives
1318 Longworth House Office Building
Washington, D.C. 20515

The Honorable Michael Michaud
United States House of Representatives
1724 Longworth House Office Building
Washington, D.C. 20515

Dear Senators Snowe and Collins and Representatives Michaud and Pingree:

After two years of fact-finding and intense study, on January 26 the Blue Ribbon Commission on America's Nuclear Future (BRC) released its used-fuel management initiatives. I am writing in support of expedited Congressional action to implement the priority recommendations of the BRC, including (1) immediate access to the funds nuclear utility ratepayers are providing for the purpose of nuclear waste management; and (2) prompt efforts to develop one or more consolidated storage facilities.

Maine Yankee ratepayers paid about $65.5 million into the Nuclear Waste Fund from 1983-1996 when Maine Yankee ceased operations. Commercial nuclear power plants pay a tenth of a cent per kilowatt hour generated into the Nuclear Waste Fund to pay for the disposal of their fuel by the U.S. Department of Energy. For fuel used prior to 1983 when the *Nuclear Waste Policy Act* was enacted, a trust fund was established through State of Maine legislation which has a current balance of about $165 million. It was partially drawn down to help pay for the construction of the Independent Spent Fuel Storage Installation but will be fully funded in October of 2013.

The safe storage, processing, transportation and disposal of nuclear fuel, waste and materials derived from nuclear activities is imperative to a sound energy security policy. The Maine Yankee site and its storage facility is one of nine spent fuel storage sites which no longer have operating nuclear power plants affiliated with the ISFSIs. I support the timely, safe, and cost-effective storage and disposal of spent nuclear fuel and high-level radioactive waste in consolidated storage facilities and, eventually, in a permanent repository, and reform of the distribution of the Nuclear Waste Fund such that ratepayer contributions are used for their intended purpose.

From an economic policy perspective, prompt removal of spent nuclear fuel from decommissioned sites like Maine Yankee and consolidating the nuclear spent fuel will not only reduce the number of sites, it will likely result in cost efficiencies that flow through to ratepayers by relieving them of the cost burden of maintaining sites that no longer generate electricity. Billions of dollars have been spent examining interim and permanent storage options for nuclear spent fuel and waste. Despite decades of research and development activities associated with Yucca Mountain, that project has been terminated with no clear direction for an alternate repository. Meanwhile, Maine Yankee is responsible for storing spent nuclear fuel in accordance with Nuclear Regulatory Commission (NRC) regulations regarding security, emergency planning, radiological monitoring and oversight, quality assurance, inspections and reporting.

I recognize that Maine Yankee is safely and securely storing the more than 550 metric tons of spent nuclear fuel at the ISFSI site and can likely continue to do so while private or government-owned candidate sites for consolidation of used nuclear fuel are identified. However, a comprehensive spent nuclear fuel management program with centralized facilities and rigorous transportation and storage requirements is necessary. It is likely safer to collect materials from these multiple sites and put them in a central location that is designed, managed and operated for that purpose. Ratepayers in Maine and other states continue to pay millions of dollars each year in storage fees, taxes, security and insurance to support the operation of spent fuel storage installations at shutdown reactor sites. Continued storage of spent nuclear fuel at decommissioned plants imposes additional costs on ratepayers and prevents economic reuse of the site. This type of system levies an opportunity cost on Maine and its communities.

The country needs to begin solving this problem. These recommendations of the BRC provide a thoughtful and sensible road map for doing just that. I hope you will act expeditiously to engage the Congressional Leadership and relevant committees to take the necessary policy steps to enable consolidated storage to be constructed, access to the waste fund for that and other waste management functions and, for the long run, establish a non-government corporation for long term management of used nuclear fuel.

Sincerely,

Paul R. LePage

Paul R. LePage
Governor

NUCLEAR ENERGY INSTITUTE

Rod McCullum
DIRECTOR
USED FUEL PROGRAMS
NUCLEAR GENERATION DIVISION

June 29, 2012

Mr. Christian J. Jacobs
Project Manager, Division of Spent Fuel Alternative Strategies
Office of Nuclear Material Safety and Safeguards
U.S. Nuclear Regulatory Commission
Mailstop EBB-2B2
Washington, DC 20555-0001

Subject: Industry Comments on the NRC Draft Report on Identification and Prioritization of the Technical Information Needs Affecting Potential Regulation of Extended Storage and Transportation of Spent Nuclear Fuel

References:
1. Letter, Rubenstone to Kokajko, Issuance of Draft Report on Identification and Prioritization of the Technical Information Needs Affecting Potential Regulation of Extended Storage and Transportation of Spent Nuclear Fuel, May 2, 2012 (ML120580123)
2. Used Nuclear Fuel Storage and Transportation Data Gap Prioritization, U.S. Department of Energy (DOE), FCRD-USED-2012-000109, PNL-21360, April 30, 2012
3. Extended Storage Collaboration Program (ESCP) Progress Report and Review of Gap Analyses, Electric Power Research Institute (EPRI) Technical Report 1022914, August 2011
4. Letter, Kessler to Jacobs, EPRI comments on the NRC draft report "Identification and Prioritization of the Technical Information Needs Affecting Potential Regulation of Extended Storage and Transportation of Spent Nuclear Fuel," June 14, 2012

Project Number: 689

Dear Mr. Jacobs:

The Nuclear Energy Institute (NEI)[1] commends the NRC for its efforts to examine the technical needs and potential changes to the regulatory framework that may be necessary to support

[1] NEI is the organization responsible for establishing unified industry policy on matters affecting the nuclear energy industry. NEI's members include all entities licensed to operate commercial nuclear power plants in the United States, nuclear plant designers, major architect/engineering firms, fuel fabrication facilities, nuclear material licensees, and other organizations and entities involved in the nuclear energy industry.

continued licensing of used nuclear fuel storage over extended time periods. The subject draft report (Reference 1) is an important early step towards addressing the regulatory challenges of extended used nuclear fuel storage, and we welcome the opportunity to comment on this report.

We note that the NRC's efforts to prioritize technical information needs are being conducted in parallel to similar efforts by the U.S. Department of Energy (DOE) as described in Reference 2 and separately by the Electric Power Research Institute (EPRI), under the auspices of EPRI's Extended Storage Collaboration Program (ESCP) as described in Reference 3. While these parallel efforts are identifying many of the same needs, there remains additional work to be done to bring them more fully into agreement. In this respect, we endorse the EPRI comments on this report (Reference 4) that pointed out differences in R&D needs ranking criteria that should be resolved. Similarly, our comments in the attachment to this letter recommend clarifications to the NRC's approach, which, if adopted, would be additionally helpful towards establishing consensus on the prioritization of technical information needs.

We believe that agreement between the various prioritization approaches is vital to establishing a strong regulatory framework for extended storage. It is important that this framework consider the implications of the DOE's used fuel disposition plans, opportunities to benefit from the DOE's research programs, and the experience that already exists with used nuclear fuel storage both in the U.S. and internationally (as reflected in the ESCP program). To this end, we encourage the NRC to continue to engage the DOE and the industry through the ESCP program.

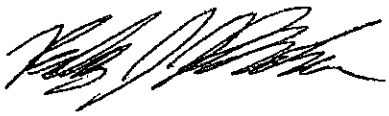
There are several aspects of the draft report that we find to be valuable towards building the consensus needed to further develop the technical basis for extended storage. Three areas are particularly noteworthy:

1. The NRC's "Methodology for Identifying and Prioritizing Potential Technical Information Needs" (section 2 of the draft report), if effectively applied, would appropriately focus the scope of technical basis development efforts based on the six assumptions and five uses for the information identified therein. In the attachment to this this letter, we make recommendations for further clarification of these assumptions and uses to ensure effective application.
2. The NRC's approach to identifying "Potential Technical Information Needs" (section 3 of the draft report) appropriately focuses on both level of knowledge and regulatory significance. It also recognizes and describes the distinct roles of the licensee and the regulator in a highly useful fashion. We agree with the manner in which the NRC has addressed these roles and offer specific comments to provide further clarification in the attachment to this letter.
3. The NRC, in sections 4 and 5 of the draft report, appropriately considers the regulatory significance and potential impact on safety as the key considerations in the overall prioritization for further research. However, we believe the identification of the regulatory

significance and potential impact to safety could be further improved and have provided specific comments to address such improvements in the attachment to this letter.

We believe that the exchange of information between the industry, the DOE and the NRC concerning the technical and regulatory aspects of extended storage of used nuclear fuel has been useful. We encourage the NRC to continue to engage the DOE and participate in the EPRI ESCP program to forge consensus approaches to addressing the technical and regulatory challenges of extended storage. We look forward to continued interaction with the NRC in this regard. If you have any questions, please do not hesitate to address them to me.

Sincerely,



Rod McCullum

c: Mr. Douglas W. Weaver, NMSS/DSFST, NRC
Mr. Lawrence E. Kokajko, NMSS/SFAS, NRC
Mr. Jim L. Rubenstone, NMSS/SFAS/STB, NRC

Attachment

Specific Comments on the NRC Draft Report on Identification and Prioritization of the Technical Information Needs Affecting Potential Regulation of Extended Storage and Transportation of Spent Nuclear Fuel

1. Role of Technical Information Needs (Sections 1&2)

The NRC's "Methodology for Identifying and Prioritizing Potential Technical Information Needs," if effectively applied, would focus the scope of the agency's technical basis development efforts based on the 6 assumptions and 5 uses for the information identified therein. We believe the intended uses and the assumptions could be further clarified in the following specific areas:

a) Reconciliation of the proposed methodology with the NRC's established policy on the regulatory approach for establishing technical bases and any necessary aging management of dry storage. This policy is explained in the Commission's Statements of Consideration for the 2011 rulemaking for 10 CFR Part 72 (76FR8876) wherein the Commission states "1) NRC staff expects very little to no fuel degradation at the end of an extended licensing period, 2) The NRC staff also expects limited degradation of other internal components because there are no significant corrosive influences in the inert environment, either for the fuel or for other components... 3) The other external components of the storage systems (which are exposed to weathering effects) would already be covered by an inspection and corrective action program, or routine maintenance." In keeping with NRC's statement on page 1-2 "...this report specifically assumes that the future licensing of spent fuel storage will follow current licensing practices," we recommend that the following areas of the report be revised to align with the established policy:

   i. When discussing the need for monitoring of components (identified as a cross-cutting issue in the report), the NRC should clarify which components or degradation mechanisms require additional monitoring or inspection. Consistent with the current licensing practices, the NRC should clarify that the fuel and cask internals would not be monitored or inspected during extended storage or transportation. The regulatory approach would be to establish guidance for EST to preclude degradation mechanisms based upon design features or operating limits. For degradation mechanisms that could not be precluded, the storage term limit would be identified based upon the timing of the degradation mechanisms of concern. This would establish the basis of EST to periods up to 300 years, or up to some shorter time period depending on whether there are age-limiting fuel or internal degradation mechanisms that could not be reasonably precluded.

   ii. It is noted that on page 3-6 the NRC states "For many of the degradation phenomena listed in Table 3-1, there are no existing capabilities for in-service inspection and monitoring of operating storage systems..." and on page 3-7 "Such methods would be valuable tools for confirming model predictions and for aging management." Similar statements are made on page 5-4. These statements should

be clarified to communicate that they only advocate for developing monitoring and inspection for external degradation mechanisms and are not advocating for monitoring or inspection of cask internal or fuel degradation mechanisms.

iii. On page B1-1, the NRC makes the assumption that monitoring techniques have been developed to determine the conditions inside the system. This is not consistent with the current regulatory approach, and should be revised to incorporate the first two principles from the NRC's statements of consideration on the 2011 rulemaking for 10 CFR Part 72.

iv. In Table 3-1, the "Monitoring or Inspection Capability" is defined as "No" for the fuel and cask internal degradation mechanisms. This should be clarified as "N/A."

b) Application of the existing regulatory approach should be proposed to determine whether regulations are adequate or if regulatory changes or alternatives are necessary. This includes the role of clad integrity, which was appropriately identified in the report as an NRC policy issue. Therefore, implementation of comment #1a is important to determine whether changes to NRC regulations or policy are warranted for extended storage periods.

c) Clarification as to whether the NRC intends to retrofit guidance for systems within the first 80 years based upon potential degradation mechanisms that only become relevant beyond 80 years. We agree with the statement in the draft report that "The current regulatory framework supports at least the first 80 years of dry cask storage..." and that the current guidance is sufficient to ensure regulatory compliance for the first 80 years. However, on page 2-2, the NRC states that one purpose is to "Enhance regulatory guidance...," which on page 1-2 is characterized as "These data will also help determine whether current NRC staff guidance...should be revised for use in longer term storage." This is further emphasized on page 5-4, which states: "...some of the phenomena may have more direct implications for changes is system fabrication or design." We believe that any enhancements to guidance necessary for storage beyond 80 years should not be compulsory for storage up to 80 years. This recognizes the low likelihood of storage beyond 80 years for any system, and even if it is needed, it would only be for a small population of casks. Therefore, imposition of more strict guidance within the first 80 years that is only necessary to address degradation mechanisms beyond 80 years would impose unnecessary burdens on a large number of casks. We believe that these decisions should be made by the Commission as a matter of policy when it evaluates whether there is a potential need for changes to the regulations for EST.

2. Approach to Determining "Potential Technical Information Needs" (Section 3)

The NRC's approach to identifying "Potential Technical Information Needs" appropriately focuses on both level of knowledge and importance to safety. It also recognizes and describes the distinct roles of the licensee and the regulator in a highly useful fashion. In this context, the report, on page 2-2, clearly identifies that the NRC's need for technical information is to develop guidance for cask systems, provide a technical basis for reviewers, and develop inspection guidance. On page 6-5, the

NRC further notes that "A low priority ranking only indicates that enough information is available for regulatory considerations." We agree with these statements, and we further observe that the NRC frequently provides guidance on one or more acceptable approaches, and/or acceptable design or operating limits, that would address technical concerns. This includes age-dependent degradation mechanism. It is important that this approach, in practice, be implemented in the efficient manner implied by these statements. In this regard, we recommend the following:

a) The NRC should address the role that regulatory guidance and generic issue resolution will play in regulating extended storage. In the ACRS Sub-committee meeting on June 5th, 2012, the NRC staff made comments suggesting considerable uncertainty in this area. These statements indicated that the staff was only concerned with identifying whether a phenomenon was a concern or not and that the NRC expected the industry to determine how to address the phenomenon. We recognize industry's role in identifying and resolving technical issues. However, if the NRC intends only to go so far as to determine that a phenomenon is or could be an issue, it is not fulfilling its role in ensuring regulatory efficiency by addressing the resolution of issues generically, nor through establishing clear guidance that articulates the agency position. Indeed, the NRC typically goes beyond just identifying whether a technical issue is a concern and pursues resolution of the technical issues with the goal of establishing guidance for generic resolution of the issue. A case in point is the NRC's program from 1998 to the early 2000s that comprehensively investigated high burnup issues related to reactor, storage and transportation issues, ultimately resulting in clear guidance and generic resolutions. In this respect, the level of knowledge rankings in Table 3-1, as determined in Appendix A, should be clarified. For example, we note that on page A1-10, the NRC identifies the need for additional data related to phenomenon of hydride reorientation for reasonable assurance of transportation, yet it rates the level of knowledge as high. We further note that current NRC guidance in this area lacks generic criteria for providing reasonable assurance for transportation and establishes that it will be addressed on a case-by-case basis. We encourage the NRC to ensure that the ranking for level of knowledge also identify, where appropriate, actions to develop generic guidance that communicates an acceptable approach.

b) The NRC should clarify the ranking of level of knowledge, which, in the draft report, is focused mainly on three questions: 1) when degradation initiates, 2) how fast it proceeds, and 3) when it concludes. While we agree with these, we also believe that the following is a key consideration on ranking the level of knowledge "Does the NRC have enough information to either 1) determine it is not an issue out to 300 years, or 2) establish guidance to either a) preclude the phenomenon from occurring out to 300 years, or b) identify the maximum timeframe for which it could be precluded and whether there are appropriate aging management techniques beyond this timeframe up to 300 years." This key consideration will ensure that the results can be readily applied in 1) determining the maximum timeframe for which the NRC has reasonable assurance for extended storage and transportation, and 2) identify the time limiting degradation mechanism for the purposes of identifying whether there may be potential rule changes that could extend the maximum timeframe for which the NRC has reasonable assurance.

c) The NRC should refine its prioritization of degradation mechanisms. We commend the NRC for compiling an exhaustive list of degradation mechanisms that could potentially be applicable to dry storage systems beyond 80 years and up to 300 years. We recognize that identifying this exhaustive list is the appropriate first step in identifying and prioritizing gaps and technical needs. However, we note that the degradation mechanisms vary from those that have a high likelihood of occurrence all the way to those that are theoretical and somewhat speculative as to whether they would occur. In this respect, placing a higher ranking on the phenomenon for which there is greater likelihood of occurrence would appropriately focus future R&D plans. This may also be partially accounted for in the NRC's cross-cutting issues, which could serve the purpose of providing early information that could later screen-out phenomena that are not potentially applicable to EST. For example, the NRC's approach to focus on the thermal profiles will provide clarity on whether temperature-based phenomena are applicable.

3. Approach to Determining "Regulatory Significance" and "Overall Prioritization" (Sections 4 & 5)

The NRC appropriately considers the regulatory significance and potential impact on safety as the key considerations in the overall prioritization for further research. However, we believe the identification of the regulatory significance and potential impact to safety could be further improved. Specifically, we recommend:

a) The rankings in table 4-1 and Appendix B should be expanded to go beyond just identifying which of the six areas for regulatory review they impact. This should appropriately consider the safety significance of the function and the safety significance of the degradation itself. In addition to the safety functions of confinement, sub-criticality and shielding affected, there should be a new column that ranks the safety significance as "high," "medium" or "low." Ideally, the safety significance could be quantified and evaluated against the NRC-established criteria for "no significant risk" such that those which are not risk significant could be screened-out.

b) In Appendix B, the report does evaluate the relative impact of a degradation mechanism on the functions evaluated. However, the form in which they are reported requires extensive analysis to determine whether the mechanism has a relative high, medium or low safety significant. It is recommended that the table be augmented with the H, M or L designations in each box for which there is an indicated effect, and that an overall column be included that considers the safety significance of all of the effects.

4. Differences Between the NRC's Ranking Approach and That of the EPRI Extended Storage Collaboration Program (ESCP)

Both the NRC draft report and the ESCP gap analysis appropriately base their priority firstly on the importance of a feature or function to maintaining safety. The NRC prioritization then primarily focuses on the level of knowledge known at the time about the process or issue while EPRI expands its consideration beyond the amount of knowledge known about the issue at that time to also take

into account whether significant research is currently being conducted on the issue and how "easy" it would be to initially detect and consequently mitigate the degradation of a safety function that has been affected. Based on the resulting criteria for specific phenomena which could occur, the NRC and EPRI both ranked certain phenomena differently. The table below highlights some of the key differences:

Component	Phenomena	NRC's ranking	EPRI's ranking
Cladding	Stress Corrosion Cracking (SCC)	High	Low
	Delayed hydride cracking	High	Medium
	Hydride reorientation	Low	Medium
	Low temperature creep	High	Low
	Low temperature annealing of radiation damage	Not ranked	Medium
	Propagation of existing flaws	High	Not ranked
Fuel assembly hardware	Stress corrosion cracking (SCC)	High	Low
	Metal fatigue caused by temperature fluctuation	High	Low
Bolts	All	High	Medium
Welded canister	Micro-biologically influenced corrosion (MIC)	High	Low/Medium
Concrete Overpack	All	High	Low

We believe that agreement between the various prioritization approaches is vital to establishing a strong regulatory framework for extended storage. It is important that this framework consider the implications of the DOE's used fuel disposition plans, opportunities to benefit from the DOE's research programs, and the experience that already exists with used nuclear fuel storage both in the U.S. and internationally (as reflected in the ESCP program). To this end, we encourage the NRC to continue to engage the DOE and the industry through the ESCP program.

5. The NRC's Conclusions About Areas That Should Receive the Highest Priority (Section 6 of the Report)

We do not agree that the issue of "effects of residual moisture after normal drying" should be given "first priority" as indicated on page 6-5 of the draft report. There are no existing or expected licensing issues surrounding the presence of water in dry storage systems. Also, research programs to quantify the amounts of water that might remain in casks would be of little value as existing information derived from industry experience drying casks in compliance with NRC regulations should provide a sufficient basis for any moisture-related degradation analysis that might be needed. We continue to believe that there is a strong basis to conclude that, given current drying practices, there is very low likelihood there is any moisture of any kind in the canister.

BRIAN SANDOVAL
Governor

STATE OF NEVADA

ROBERT J HALSTEAD
Executive Director

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June 29, 2012

Chief, Rulemaking Branch
Division of Administrative Services
Office of Administration
Mail Stop: TWB-05-B01 M
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

RE: Request for 60-Day Extension to Comment on Draft Report NUREG-2125
Docket ID NRC-2012-0108

Dear Sir:

The State of Nevada Agency for Nuclear Projects requests a 60-day extension of the public comment period for Spent Fuel Transportation Risk Assessment, Draft Report for Comment, NUREG-2125, published May 2012. The Federal Register notice published May 14, 2012, announced a 60-day comment period ending July 13, 2012. We received the paper copy and CD in our office on May 23, 2012.

We have been reviewing this document for the past five weeks and request additional time for review and comment for the following reasons:

- The length of the report (almost 500 pages), the scope of the report, and the complexity of the subject matter in and of themselves justify a longer comment period;

- Specific technical issues, such as the selection of shipping cask designs for analysis (and the decision not to include two currently licensed casks, the NAC LWT and the IF-300); assumptions about spent fuel burn up history and cooling time; selection of origin-destination pairs, routes, and buffer distances used for routine dose and accident risk analyses; and consequence analyses for transportation accidents resulting in release of radioactive materials, have required that our agency contract with an outside technical reviewer to assist us in preparing our comments; and

- The subject report references in its bibliography, but apparently does not actually include in its analyses, a number of recent NRC sponsored studies of transportation accidents involving long-duration, high-temperature fires, requiring additional time to evaluate possible contradictions between those NRC studies and the findings of NUREG-2125.

A comprehensive and objective review of NUREG-2125 is extremely important in relation to current efforts at the Commission to evaluate the risks and impacts of extended spent fuel storage and transportation and current efforts at the U.S. Department of Energy to develop an implementation strategy for the recommendations of the Blue Ribbon Commission on America's Nuclear Future. We ask that you grant our request for additional time to review and comment so that we may more fully consider the assessment of transportation risks in NUREG-2125.

Respectfully,

Robert J. Halstead
Executive Director

cc: Division of Spent Fuel Transportation and Storage, Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission