

MAINE STATE LEGISLATURE

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April 4, 2016

MEMORANDUM

TO: Senator Michael Thibodeau, President of the Senate, and Representative Mark Eves, Speaker of the House

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

SUBJECT: State Nuclear Safety Inspector's September through December 2015 Monthly Reports 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 reports focus on activities at the site and include highlights of the national debate on storing and disposing of the used nuclear fuel. For your convenience, highlights of local and national events are captured in the executive summary of the reports.

The enclosed reports provide 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.

MCM/klv

Enclosure

cc: Mark Lombard, U.S. Nuclear Regulatory Commission
Monica Ford, U.S. Nuclear Regulatory Commission, Region I
J. Stanley Brown, Independent Spent Fuel Storage Installation Manager, Maine Yankee
David Sorensen, Senior Health Policy Advisor
Kenneth Albert, Director, Maine Center for Disease Control and Prevention
Paul Mercer, Commissioner, Department of Environmental Protection
Timothy Schneider, Maine Public Advocate
Lieutenant Scott Ireland, 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

December 2015 Monthly Report to the Legislature

Executive Summary

The report covers activities at the Maine Yankee Independent Spent Fuel Storage Installation (ISFSI) facility, including the State's ongoing environmental radiation surveillance and provides updates on the national effort to license and construct a consolidated interim storage facility and/or a permanent geologic repository for the disposal of spent nuclear fuel. Maine's goal is to move the ISFSI waste stored at Maine Yankee to one of these facilities. The report's highlights assist readers to focus on the significant activities that took place both locally and nationally during the month.

Local

- Maine Yankee submitted its updated Decommissioning Funding Plan to the Nuclear Regulatory Commission (NRC). The Plan listed the costs for managing the spent nuclear fuel and Greater Than Class C Waste and decommissioning the ISFSI through 2033. The Decommissioning Cost Estimate submitted as part of the Plan appraised the total cost for decommissioning the ISFSI at \$27.4 million with the radiological portion costing about \$21.6 million.

National:

- The Department of Energy's (DOE) Office of Inspector General released an audit report of the Nuclear Waste Fund, which showed a balance of \$34.4 billion with the Fund earning over \$1.5 billion in interest in Fiscal Year 2015. Since the federal government's 1998 default on its contracts with nuclear utilities to take the spent nuclear fuel, the report highlighted that taxpayers have paid \$5.3 billion to date in awards to utilities with an estimated federal liability of \$23.7 billion remaining. The Fund is used for the ultimate disposal of the nation's spent fuel stockpile.
- The Western Governors' Association issued a Policy Resolution on the transportation of radioactive waste, radioactive materials, and spent nuclear fuel. The resolution stressed the federal government's role in ensuring "early coordination and communication with state, tribal, and local governments" and emphasized the "responsibility of the federal government and the generators of spent nuclear fuel to pay for all transportation costs" borne by states, tribes, and local governments.
- DOE published in the Federal Register its intent to seek public comment on what elements should be contained in a consent-based process for the siting of nuclear waste storage and disposal facilities. To facilitate involvement DOE provided five questions to start the discussion on designing a process.

Introduction

As part of the Department of Health and Human Services' long standing oversight of Maine Yankee's nuclear activities under Title 22, Maine Revised Statutes (MRS) §666 (2), 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 ISFSI facility located in Wiscasset, Maine.

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 ongoing, 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.

Independent Spent Fuel Storage Installation (ISFSI)

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

There were no fire-related impairments for the month. However, there were four security incident reports logged for the month. Two of the incident reports were written to provide compensatory measures to support a system maintenance activity, while a third was to support snow removal. The fourth report involved a degradation security system due to an offsite equipment malfunction which required compensatory measures until the system was repaired and restored later that day.

There were twenty-two condition reports¹ (CR) for the month and they are described below.

- 1st CR: Documented a potential tripping hazard on the second floor of the building. The area was evaluated and caution tape and signage was added.
- 2nd CR: Documented that one radio channel was not working when contacting Lincoln County. Troubleshooting determined that the problem was with the Lincoln County's radio set. The radio was repaired.
- 3rd CR: Documented an outside light was turning off and then back on at different times during the night. The light was observed for three weeks with no repeat occurrence. If the problem recurs, the ballast will be replaced.
- 4th CR: Documented an evaluation of the Maine State Police notification protocol during an Unusual Event. The evaluation recommended that the protocol be discussed with the State to determine which State agency should take ownership of the protocol.
- 5th CR: Documented a potential procedure non-compliance regarding weapons storage requirements. Personnel were briefed on the weapons storage and availability requirements.
- 6th CR: Documented two suspect phone calls on the same day. The first caller phoned several times requesting to speak to a staff member but would not say why. The second caller asked to speak to a person not employed by Maine Yankee. Since the phone calls did not meet the suspicious activity definition, the NRC was not notified. However, a courtesy notification was made to the Maine Information and Analysis Center.
- 7th CR: Documented that some wooden planks covering the gaps between cask pads had come loose. The planks were reattached with new screws.
- 8th CR: Documented the identification of some chipping of concrete along the bottom edge of several concrete casks. These were previously identified and found acceptable. Their condition will be tracked for any further degradation.
- 9th CR: Documented that during movement of file cabinets, a fire door was received a small dent. The door was assessed to be functional with no impact to its fire rating. The dent was repaired.
- 10th CR: Documented that an earthquake had occurred in Waldoboro. No movement was felt or seen at the site. Nevertheless, a site inspection was performed as a precaution.
- 11th CR: Was written to track recommendations from the Independent Management Assessment performed in November. The Assessment made twelve recommendations including training on a safety conscious work environment, enhancing procedure change tracking, and modifying the condition report process. The CR will remain open pending evaluation of each recommendation.
- 12th CR: Documented a procedural weakness with vehicle control. The procedure did not contain an

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 Control Program's website.

- expiration date column and a company vehicle's access authorization form had expired.
- 13th CR: Documented that a trouble alarm was received in an alarm system. Compensatory measures were put into place. A vendor representative was brought in to troubleshoot. The problem was determined to be due to an offsite vendor's equipment. The equipment was repaired and the system was tested satisfactorily later that day.
- 14th CR: Documented the notification of a vendor informing Maine Yankee of a trouble alarm received at their end from the previous day. The system was working satisfactorily.
- 15th CR: Documented a battery pack/emergency light was not listed in Attachment D of a fire protection procedure. The procedure was updated to reflect the equipment.
- 16th CR: Documented an additional comment from the Independent Management Assessment. Two CRs written in 2015 were suggested for possible re-opening based on the corrective actions. Both CRs were reviewed and determined to be closed appropriately.
- 17th CR: Documented a repeat issue with the Lincoln County's radio system identified earlier in the month. Lincoln County switched to their back-up radio and eventually replaced their primary radio.
- 18th CR: Documented a log entry was missing for the inventory of two computer thumb drives. The inventory records were correct but the initiating log entry was not made.
- 19th CR: Documented that a heater had failed in an equipment cabinet, even though the cabinet temperatures met procedural requirements. A heater was ordered and the failed unit replaced.
- 20th CR: Documented that a Digital Video Recorder (DVR) had lost its recording capability. All security systems were operational. The DVR was re-booted and restored to normal operation.
- 21st CR: Documented the results of the annual Fire Protection Program review. The review noted that one of the fire protection procedures required a revision to delete a reference to transient combustibles permits. All document changes were completed.
- 22nd CR: Documented the receipt of a sewer pump trouble alarm. The cause of the alarm was due to high groundwater in the sewer vault. The alarm was cleared when the vault was pumped out.

Other ISFSI Related Activities

1. On December 15, Maine Yankee submitted to the NRC their seventh revision to their Emergency Plan. The eight changes were mostly administrative in nature. They included reformatting, renumbering pages, deleting a note in one of the tables, adding one reference, and title changes such as Emergency Coordinator to Emergency Director, General Employee Training to ISFSI Access Training, and updated titles to the Fire Protection and Physical Security Plans. The remaining two changes dealt with radiation protection issues. The first involved removing the specific location where potentially contaminated individuals would be monitored and leaving it up to the radiation protection personnel to decide where the monitoring and decontamination, if necessary, would be performed. The second radiation issue designated the Radiation Protection Contractor as responsible for providing the appropriate personnel protective equipment to work in contaminated areas.
2. On December 16, Maine Yankee submitted its updated Decommissioning Funding Plan to the NRC. The Plan updated the costs for managing the spent nuclear fuel and Greater Than Class C (GTCC) Waste and the ISFSI Decommissioning Cost Estimate (DCE) through 2033. The DCE appraised the total cost for decommissioning the ISFSI at \$27.4 million for 2015. The radiological decontamination portion was estimated at \$21.6 million for 2015 with the remaining \$5.8 million for the non-radiological decontamination costs. The submittal included a certificate of financial assurance that funds would be available to perform the ISFSI decontamination and decommissioning and that funds for decommissioning were segregated from the funds for ongoing management of the stored spent nuclear fuel and GTCC wastes.

Environmental:

There is no environmental data to report on this month.

Other Newsworthy Items:

1. On December 1, DOE's Office of Inspector General released an audit report, entitled, "Department of Energy Nuclear Waste Fund's Fiscal Year 2015 Financial Statement Audit." The report outlined the independent audit conducted on the Fund's financial statements and noted that the accounting complied with generally accepted government auditing standards with no instances of non-compliance or deficiencies with laws or regulations. The balance sheets illustrated the assets and liabilities as of September 30, 2014 and 2015. According to the audit report cumulative billings from fees to nuclear generating utilities, the Defense Nuclear Waste Disposal Appropriations, and investment interest earnings totaled \$48.8 billion as of September 30, 2015 whereas the cumulative expenditures were \$11.4 billion leaving a Fund balance of \$34.4 billion. Since the federal government's 1998 default on its contracts with nuclear utilities to take the spent nuclear fuel, the report highlighted that taxpayers have paid \$5.3 billion in awards to utilities with an outstanding, estimated federal liability of \$23.7 billion. The web link for the report can be accessed by positioning the cursor over the underlined text and following the directions.
2. On December 3, the House Subcommittee on Environment and the Economy held a hearing on "The Nuclear Waste Fund: Budgetary, Funding, and Scoring Issues." The Subcommittee's background document provided an insightful historical perspective on "the formation and implementation of the Nuclear Waste Fund (NWF)" and how Congress enacted several laws that reduced the funding flexibility initially envisioned in the Nuclear Waste Policy Act. The laws enacted spending and revenue controls that made the Fund dysfunctional and prevented the Fund from being used for its intended purpose. Three witnesses were asked to testify before the Subcommittee. One was from the Congressional Research Service (CRS), another from the Congressional Budget Office (CBO), and one from the National Association of Regulatory Utility Commissioners (NARUC). The CRS testimony centered on explaining the budgetary framework of the NWF (how receipts are treated and how the Fund is invested in U.S. Treasury securities) and the status of the NWF with an expectation of receiving \$1.53 billion in interest in FY 2015 with a current balance of \$34.3 billion as of November 2015. The CBO testimony focused on the federal government's responsibilities and liabilities under the Nuclear Waste Policy Act, financing the costs for disposing of civilian and defense-related nuclear waste, and the budgetary impacts of activities related to nuclear waste management from a historical perspective to projections to a long-term outlook. The NARUC testimony emphasized three points. "America needs, and consumers have paid for, a permanent solution to nuclear waste disposal." "The NWF is a self-funded, special-purpose program and it should be treated as such." "Congress should establish an independent body that has the single-minded mission of nuclear waste disposal and has access to the billions ratepayers have contributed for this purpose." The web link for the Subcommittee background document can be accessed by positioning the cursor over the underlined text and following the directions. The testimonies can be accessed by positioning the cursor over the underlined texts above.
3. On December 4, the Western Governors' Association issued Policy Resolution 2016-03 on the transportation of radioactive waste, radioactive materials and spent nuclear fuel. The resolution listed twelve objectives that must be maintained and continued to ensure for the safe and uneventful transport of such material with all modes of transportation. The resolution stressed the federal government's role in ensuring "early coordination and communication with state, tribal, and local governments" and receiving "the full commitment and cooperation from the rail industry in implementing best practice transport." The policy resolution also emphasized the "responsibility of the federal government and the generators of spent nuclear fuel and high-level waste to pay for all costs associated with assuring safe transportation and responding to accidents and emergencies that may occur." The web link for the resolution can be accessed by positioning the cursor over the underlined text and following the directions.

4. On December 9, AREVA issued a press release that they were awarded a \$9.5 million contract by DOE to design and fabricate railcars for spent nuclear fuel and high-level waste shipments. The railcars will include transport cask cars and buffer cars as spacers between the cask cars and the locomotive. The prototype cars are expected to be designed, tested, and delivered to DOE in 2019. AREVA is a French multinational firm specializing in nuclear and renewable energy that is headquartered in Paris. It is the largest nuclear company in the world. The web link for the news release can be accessed by positioning the cursor over the underlined text and following the directions.
5. On December 9-10, the Southern States Energy Board held a joint meeting of the Radioactive Materials Transportation Committee and the Transuranic Waste Transportation Working Group. The Board received updates from various federal programs that included an NRC's overview of their ongoing activities (the Yucca Mountain license application, spent fuel storage and transportation, and interim storage), the status and preliminary results of the states' involvement in a mock grant process with DOE for training local responders in preparation for a national, spent fuel shipping campaign, the U.S./Canadian shipping campaign of highly enriched uranium from the Chalk River Laboratories in Canada to the Savannah River Site in South Carolina, tribal perspectives on emergency response and radioactive materials, and DOE's reviews and updates of the world's first geologic repository (Waste Isolation Pilot Project) near Carlsbad, New Mexico, the status of the reactor shutdown sites available transportation infrastructure, and the nuclear fuels storage and transportation planning project. The agenda, the meeting summary, and all the presentations can be accessed at the following web link: <http://www.sseb.org/news-and-events/past-events/>. Although all the presentations were valuable, the states' mock grant exercise, the NRC, and the three DOE's presentations were especially useful in depicting the current status of national efforts to move spent nuclear fuel.
6. On December 11, the NRC Chairman responded to Nevada Senators Reid's and Heller's six requests they raised on additional information on packages that the NRC has approved for the transportation of spent nuclear fuel and high-level radioactive waste (SNF/HLW). The Chairman included responses to three of the requests and deferred the other three to a later date when that information becomes available. The Chair informed the Senators that the NRC has 19 packages that are under review or have been certified to transport SNF/HLW. Two of the 19 packages were designed by the Naval Reactors Program and were classified as "Confidential – Restricted Data." Consequently, information on these two packages was not included, but the NRC staff could brief appropriately cleared individuals from the Senators' staffs. The Chair included two attachments with the enclosure that responded to three of the requests. The first attachment provided a physical description of each packaging under review or certified along with a physical description of the impact limiters, the design waste volumes, and the approved modes of transportation such as rail, truck, or boat. None of the packages were approved for air transportation. The second attachment explained the "three main safety criteria for package performance: maintaining package radiation dose rates, maintaining release of radioactive material below the maximum allowable limits, and ensuring the contents remain subcritical (unable to sustain a chain reaction)." The second attachment not only described the specific radiation levels, but also the types of testing the package must meet for normal conditions of transport as well as for hypothetical accident conditions. The web links for the letter, enclosure, and attachments 1 and 2 can be accessed by positioning the cursor over the underlined texts and following the directions.
7. On December 16-17, the Northeast High-Level Radioactive Waste Transportation Task Force, a subsidiary of the Eastern Regional Conference's Council of State Governments, held its fall meeting in Portsmouth, New Hampshire. The Task Force received several updates from DOE on their railcar award, their training and planning activities, the status of their geologic repository in New Mexico, and their transportation related activities for environmental clean-up at sites across the country. Additional updates were provided by Maine Yankee on the modes of transportation available at the three Yankee sites along with the current landscape of congressional activity and by Pennsylvania on their participation in the DOE's mock grant process for funding emergency preparedness training for local

responders for spent fuel shipments. Tribal perspectives on transportation of radioactive material were also shared with the Task Force. Two firms competing for constructing an interim storage facility, one in Texas and one in New Mexico, shared their views on why their proposals merited attention. Holtec discussed their efforts and strengths in obtaining an NRC license for the New Mexico site, based on their previous experience with a storage facility in Utah that was licensed by the NRC, an underground storage system, and 53% of the dry storage systems used in the U.S. for operating reactors are manufactured by Holtec. In addition, Holtec also coupled their presentation with an international shipper who recommended barging the spent fuel casks from Maine Yankee, Connecticut Yankee and Yankee Rowe in Massachusetts to Texas as the most effective transportation mode. Likewise, Waste Control Specialists (WCS) demonstrated their enhanced approach to low-level waste disposal and highlighted their strengths with proven programs and a strong infrastructure for rail access for managing radioactive materials such as irradiated hardware and large components. WCS also shared their efforts to submit a license application to the NRC to construct consolidated interim storage facility by April of 2016. All the presentations can be accessed at the following web link: <http://www.csg-erc.org/policy-radioactive-transportation/> and by scrolling down and clicking on the appropriate presentation.

8. On December 18, DOE responded to the Council of State Governments October 6 letter, which expressed frustration over sharing and receiving documents. The Acting Assistant Secretary informed the Co-Chair that his staff was required to adhere to federal laws, which could add to delays. However, he noted that his staff had made significant strides in 2015 in improving DOE's internal processes by releasing from their backlog six technical documents and 27 conference papers. The web link for the letter can be accessed by positioning the cursor over the underlined text and following the directions.
9. On December 22, the NRC voted on the staff's paper, "Historical and Current Issues Related to Disposal of Greater Than Class C (GTCC) Low-Level Radioactive Waste." The staff's paper proposed three options on whether an Agreement State such as Texas can license a GTCC disposal facility. NRC Chairman Burns voted in part to approve the staff's recommendations on initiating a rulemaking to address inconsistencies in the regulations on transuranic waste and developing generic criteria for disposal of GTCC waste. He considered the jurisdictional issue on this as premature. Commissioner Svinicki approved the staff's position provided the NRC develops a process that that would allow an Agreement State to exercise its authority to license such a facility. Since Texas has experience in licensing a low-level waste disposal facility, then the NRC could benefit from the technical exchange. Commissioner Ostendorff agreed that an Agreement State would have the authority to license such a facility under the Atomic Energy Act as amended. Since the current regulations do not address specific requirements for GTCC disposal, the Commissioner opted for the staff to develop a rulemaking to establish what forms of GTCC waste that could be disposed in a near-surface facility. Commissioner Baran took issue with the staff's position that an Agreement State could license a GTCC waste disposal facility. He cited portions of the Low-Level Waste Policy Amendments Act which states that any low-level waste in concentrations exceeding the Class C limits would be regarded as a federal responsibility and, therefore, required federal licensing. On the transuranic waste issue the Commissioner agreed that the NRC staff should initiate a rulemaking to include transuranic waste disposal as part of its regulations. Since no GTCC facilities have ever been licensed and GTCC waste by its very nature contains high concentrations of radioactive material, the presumption is that GTCC waste can only be disposed in a deep geologic repository. (Maine Yankee has four concrete casks containing GTCC material.) The web link for the voting record can be accessed by positioning the cursor over the underlined text and following the directions.
10. On December 23, DOE published in the Federal Register its intent to seek public comment on what elements should be contained in a consent-based process for the siting of nuclear waste storage and disposal facilities. To facilitate public involvement DOE listed five questions to the public to elicit a response. The five questions were:
 - a) How can the Department of Energy ensure that the process for selecting a site is fair?

- b) What models and experience should the Department of Energy use in designing the process?
- c) Who should be involved in the process for selecting a site, and what is their role?
- d) What information and resources do you think would facilitate your participation?
- e) What else should be considered?

The intent of the questions was to start the discussion on designing a process. DOE was planning on holding a number of public meetings to receive feedback. The Federal Register notice can be accessed at the following link: <https://www.federalregister.gov/articles/2015/12/23/2015-32346/invitation-for-public-comment-to-inform-the-design-of-a-consent-based-siting-process-for-nuclear>.

11. In December, the International Atomic Energy Agency published a final report on coordinated research conducted between 2011 and 2015. The report was entitled, "Evaluation of Conditions for Hydrogen Induced Degradation of Zirconium Alloys during Fuel Operation and Storage." The report evaluated the delayed hydride cracking (DHC) in several types of reactors and the zircaloy-4 cladding that houses the nuclear fuel. The types of reactors included pressurized water reactors, like Maine Yankee, boiling water reactors, Canadian reactors (CANDU), pressurized heavy water reactors, and the Russian pressurized water and graphite reactors (VVER and RBMK). The research was performed by representatives from 13 laboratories from all over the world and involved such countries as Argentina, Brazil, Canada, India, Japan, South Korea, Lithuania, Pakistan, Romania, Russia, Sweden, Switzerland, and Ukraine. The DHC issue is important as several components have failed by this degradation mechanism. "Zirconium alloys are susceptible to embrittlement (loss of a material's ability to stretch under stress) by hydrogen when hydrides (hydrogen combining with another element) are precipitated." The hydrogen follows the stress to a flaw where hydrides form a nucleus and grow slowly. When the hydrides reach a critical point, they fracture and extend the crack and the process begins again. "DHC is important in dry storage of spent nuclear fuel since the temperature history is ideal for such cracking." Therefore, it is crucial to understand the conditions under which the DHC will initiate cracking, what conditions are necessary to propagate the crack, and whether the crack will affect the cladding's structural integrity, which would be an important consideration for transporting spent nuclear fuel. The web link for the report can be accessed by positioning the cursor over the underlined text and following the directions.