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**MEMORANDUM**

**TO:** Senator Michael D. Thibodeau, President of the Senate  
Representative Sarah Gideon, Speaker of the House  
Senator David Woodsome, Co-Chair of the Joint Standing Committee on Energy,  
Utilities and Technology  
Representative Seth Berry, Co-Chair of the Joint Standing Committee on Energy,  
Utilities and Technology

**FROM:** Ricker Hamilton, Commissioner   
Department of Health and Human Services

**SUBJECT:** 2016 Report to the Legislature on the State Nuclear Safety Inspector's Oversight  
Activities of the Maine Yankee Independent Spent Fuel Storage Installation (ISFSI) in  
Wiscasset, Maine

Legislation enacted in the spring of 2008 requires the State Nuclear Safety Inspector, in cooperation with the Director of the Division of Environmental Health in the Maine Center for Disease Control and Prevention, to prepare an annual report of the State Inspector's activities to the Legislature. The report must be submitted annually to the Legislature with oversight from the Joint Standing Committee on Energy, Utilities and Technology by the 1st of July. The report focuses on activities at the site and includes highlights of the national debate on storing and disposing the used nuclear fuel.

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 123<sup>rd</sup> Legislature.

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

RH/klv

Enclosure

cc: Nick Adolphsen, Acting Senior Health Policy Advisor, Governor's Office  
Dr. Bruce Bates, Director, Maine Center for Disease Control  
Paul Mercer, Commissioner, Department of Environmental Protection  
Barry Hobbins, Maine Public Advocate  
Lieutenant Scott Ireland, Special Services Unit, Maine State Police



*Paul R. LePage, Governor*      *Ricker Hamilton, Acting Commissioner*

**2016 Report to the Legislature-**  
on the  
**State Nuclear Safety Inspector's Oversight Activities**  
of the  
**Independent Spent Fuel Storage Installation (ISFSI)**  
at the  
**Maine Yankee Site in Wiscasset, Maine**

*Prepared for*  
**Joint Standing Committee on  
Energy, Utilities, and Technology**  
Pursuant to 22 MRS §666(2)

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## Executive Summary

The storage of the high level waste in Wiscasset is an important issue to the State. It creates an undue burden to the local community and State by not being able to reuse or redevelop prime, coastal real estate. Moreover, it sets up a potential terrorist target that could result in future unintended consequences. Furthermore, the Obama Administration's decision to withdraw the Department of Energy's (DOE) license application before the Nuclear Regulatory Commission (NRC) effectively terminated the Yucca Mountain repository and potentially imposed on our citizens a de facto high-level nuclear waste dump site in Maine.

The following report details the State Nuclear Safety Inspector's (SNSI) oversight activities for the calendar year 2016 performed at Maine Yankee's Independent Spent Fuel Storage Installation (ISFSI) in Wiscasset. Section 2 of the report describes the activities undertaken. The report also includes highlights of national and global developments.

Locally, Maine Yankee had some notable achievements for the year. First, the Federal Appeals Court awarded Maine Yankee \$24.6 million as part of its third successful litigation of the federal government's breach of contract for not taking title and possession of the spent nuclear fuel stranded in Wiscasset. Maine Yankee also paid off their long outstanding pre-1983 obligation of \$186.4 million to the Nuclear Waste Fund. Furthermore, Maine Yankee conducted a successful cask-lid lift and gained notoriety by performing the first robotic camera inspection of a canister's externals. Sandia National Laboratories reported that their analyses of Maine Yankee's samples revealed very low concentrations of salts, which meant that the likelihood of chloride-induced stress corrosion cracking of the canister welds was very remote at the Maine Yankee site.

There was very little movement on the national scene this year to move the spent nuclear fuel stored at Maine Yankee, or other reactor sites throughout the country. Congress was still deadlocked over the management of spent fuel with the House supporting the resumption of the Yucca Mountain Project and the Senate focused on developing consolidated interim storage facilities. However, there were two interesting congressional initiatives on the House side for interim storage facilities, namely the "Interim Consolidated Storage Act of 2016" and the "Stranded Nuclear Waste Accountability Act of 2016." The Storage Act would have allowed DOE to take title of commercial spent nuclear fuel and enter into storage contracts with private firms, such as Waste Control Specialists (WCS). Under the Accountability Act DOE would have received \$100 million a year to reimburse communities with shutdown reactor sites that store spent nuclear fuel. Under this plan Wiscasset would have received \$8.1 million for seven years.

The past year had more activity than previous years. For example, after President Obama approved in 2015 an integrated waste management plan for a defense-only high-level radioactive waste repository, DOE pursued in 2016, a deep borehole concept to dispose of certain types of highly radioactive defense-wastes three miles deep into the earth's crust. As part of the Obama Administration's nuclear waste management strategy, DOE also solicited public input at several locations nationwide on developing a national consent-based siting process and later published the highlights from those public discussions. Finally, as part of their preparations for a national shipping campaign for spent nuclear fuel, DOE received the first of three reports on the design and prototype fabrication of cask and buffer railcars that would meet the Association of American Railroads' requirements' for the transport of high-level radioactive materials.

WCS submitted in April 2016 their license application to the NRC for a consolidated interim storage facility in West Texas. In addition, the NRC agreed to WCS' request to expedite the licensing process by formally starting the environmental assessment on WCS' license application. Besides finalizing their Supplemental Environmental Impact Statement on Yucca Mountain's groundwater, the NRC continued with its Yucca

Mountain licensing proceedings while making publicly available nearly 3.7 million documents available from the Yucca Mountain Project.

Internationally, Finland became the first country in the world to start the construction of a permanent geologic repository to house the disposal of spent nuclear fuel for 100,000 years or more.

## 1.0 Introduction

### 1.1 Historical Perspective

The State had one nuclear power plant, called the Maine Yankee Atomic Power plant (Maine Yankee), and it was located in Wiscasset, Maine. It operated from the fall of 1972 to December 1996. Maine Yankee was initially rated at about 825 megawatts electric or 2440 megawatts thermal and by the end of its life the Maine Yankee plant was producing slightly over 900 megawatts of electricity.

At the time of its final shutdown in December 1996, the plant owners were facing some major issues, principally cable separation and the aftermath of the Nuclear Regulatory Commission's (NRC) Independent Safety Assessment Team (ISAT) findings pertaining to plant safety systems, such as the failure to adequately test safety related components, the undiscovered deficient conditions of the service water and auxiliary feed water systems, post-trip reviews that lacked rigor and completeness and ineffective corrective actions leading to repetitive problems to name a few. Although the NRC considered the overall performance adequate for operation, the weaknesses stemmed from economic pressures to contain costs and poor problem identification. The State was also a participant in the ISAT process and a member of the Independent Safety Assessment Team.

In 1997, the plant owners decided that the likelihood of operating at a profit was non-existent in light of Maine's electric restructuring act passed that same year. With the availability of cheaper power from Canada, the plant was no longer considered economically viable. In May 1997, Maine Yankee's owners announced that it would either sell or close the plant if there were no buyers. Despite a serious assessment performed by Philadelphia Electric Company to purchase Maine Yankee, in July 1997, both parties could not come to an agreement and in August 1997, the Board of Directors voted to shut down the plant permanently and commence the immediate dismantlement of the nuclear facility. The planning process for the site's decommissioning began shortly after the official closure and the decommissioning lasted nearly eight years from 1997 to 2005.

When the Nuclear Waste Policy Act (NWPA) was enacted in 1982, Congress assumed that a national repository would be available by 1998 for the disposal of the spent fuel. The NWPA mandated the Department of Energy (DOE) to take title and possession of the nation's spent nuclear fuel in 1998. Since the high level waste repository at Yucca Mountain in Nevada had experienced significant licensing and construction delays, DOE was unable to take title and possession of the nation's spent fuel and consequently breached its legal contracts with all the nation's nuclear power utilities.

Because the DOE was unable to fulfill its contractual obligations to accept the spent nuclear fuel by January 1998, Maine Yankee was compelled to construct an ISFSI in Wiscasset to store the high level waste in casks until a consolidated interim facility is constructed to store the waste, or a national repository becomes available to dispose of the used nuclear fuel. The ISFSI stores the 1434 spent fuel assemblies that were previously housed in the spent fuel pool in the plant, into 60 storage casks on-site. Another four casks contain some of the more radioactive components of the reactor internals that were cut up during decommissioning, because their radioactive concentrations were too high to dispose of at a low level radioactive waste disposal facility. These are expected to be shipped along with the spent fuel to a deep geologic repository when one becomes available sometime in the future.

Consequently, Maine Yankee filed a lawsuit against the federal government to recoup its ISFSI costs. However, Court precedent dictated that damage awards can only cover costs that have been incurred. Maine Yankee was therefore required to submit periodic filings to recover their costs for the construction and operation of the ISFSI. The initial lawsuit covered the period from 1998 through 2002 and after 14 years of litigation the Courts' awarded Maine Yankee \$81.7 million. The second lawsuit covered the years through 2008. Again the Court decided in 2013 in Maine Yankee's favor and awarded it \$35.7 million. Maine Yankee filed a third lawsuit in 2013 for the years 2009 through 2012 and was finally awarded \$24.6 million in 2016. Maine Yankee has stated that it will continue its periodic filings until the spent nuclear fuel is removed from the Wiscasset site.

Although President Bush recommended to Congress and Congress approved the Yucca facility as the nation's federal repository for spent nuclear fuel in 2002, the DOE did not submit a license application until June of 2008, which was accepted for review by the NRC in September of 2008. Since then, the Obama Administration and Energy Secretary Chu had advocated for the termination of the Yucca Mountain site as they no longer considered it a viable option. Thus, in March 2010, without any technical or safety merits, the DOE submitted a motion to the NRC's Atomic Safety and Licensing Board to withdraw its Yucca Mountain license application. Energy Secretary Chu then assembled a Blue Ribbon Commission of experts to review alternative strategies for managing the nation's nuclear waste. The Commission issued a report in January 2012 that provided a blueprint on how the nation should manage its spent nuclear fuel. The Report contained eight essential key elements and proposed six legislative changes to affect its recommendations. Of the eight recommendations two would be critical in moving the used nuclear fuel from the Wiscasset facility. The first is the construction of one or more consolidated interim storage facilities. The second is the provision that decommissioned sites would receive first priority in the movement of their stranded spent fuel.

In January 2013, the DOE issued its strategy for the management and disposal of spent nuclear fuel and high-level radioactive waste. Their document incorporated some of the Blue Ribbon Commission's key principles such as a consent-based process and a storage and disposal framework that would include a pilot interim storage facility, a larger full-scale storage facility and a geologic disposal repository with priority given to shut-down reactor sites. However, congressional legislation would be required to enact portions of the Administration's integrated strategy. This has proven difficult as Congress is at an impasse with the House fixated on the Nuclear Waste Policy Act and the Yucca Mountain Project, while the Senate is more focused on moving beyond Yucca Mountain and enacting new legislation that would embody some of the Blue Ribbon Commission's key recommendations. Even with this stalemate there are some willing communities seeking to host spent nuclear fuel facilities, such as near Carlsbad, New Mexico and Andrews County in west Texas. Despite State opposition, Nye County in Nevada has reaffirmed their commitment to host the Yucca Mountain repository.

It became apparent that the Courts would have to weigh in and decide on the merits of lawsuits brought against the federal government. In August 2013, the U.S. Court of Appeals for the District of Columbia Circuit issued its long-awaited decision and ruled in favor of the writ of mandamus ordering the Nuclear Regulatory Commission to resume the terminated Yucca Mountain Licensing Process. In November 2013, the Appeals Court followed suit and issued an Order for the Energy Department to cease collecting the Nuclear Waste Fund fee from nuclear utilities until such time Yucca Mountain is revived or Congress authorizes an alternative waste management plan. The DOE officially ceased collecting fees in May 2014.

## 1.2 Law

The spent fuel at Maine Yankee is likely to be stored in Wiscasset for decades to come. In March of 2008, in the second regular session of the 123<sup>rd</sup> Legislature, the Legislature enacted and the Governor signed into law the establishment of the State Nuclear Safety Inspector Office within the Department of Health and Human Services to provide independent oversight of the Maine Yankee ISFSI. The law also mandated that an Oversight Group, comprised of various state agencies, Maine Yankee and an independent expert in radiological and nuclear engineering, meet on a quarterly basis to discuss the protection of public health and safety at the ISFSI site and be involved in national activities that would hasten the timely removal of the spent nuclear fuel from the site. The law went into effect June 29, 2008. After much discussion, the Oversight Group chose not to hire an independent expert since the Group collectively possessed the necessary expertise and reported this decision in its 2009 annual report to the Legislature.

## 2.0 State Nuclear Safety Inspector Activities

The State Nuclear Safety Inspector's (SNSI) oversight role includes the following tasks:

- Reviews daily the operational and security reports from the on-site security staff;
- Performs environmental surveillance of the Maine Yankee environs to include field measurements of the local radiation levels;
- Participates in the biennial Nuclear Regulatory Commission inspection of the facility;
- Participates in the ISFSI's annual emergency plan exercise;
- Reports activities monthly and annually to the Legislature;
- Provides an annual accounting to the Legislature of the funds received and disbursed out of the Interim Spent Fuel Storage Facility Oversight Fund;
- Interfaces with various state agencies also performing oversight functions at the ISFSI;
- Reviews and comments, if appropriate, on Maine Yankee submittals to the Nuclear Regulatory Commission;
- Participates in regional and national organizations involved in the Yucca Mountain project in Nevada and the development of a national transportation network for moving used nuclear fuel to consolidated interim storage sites; and
- Investigates and monitors websites to keep abreast of national developments on spent nuclear waste management and research.

The following sections contain the SNSI'S activities for the 2016 calendar year under certain broad categories covering the ISFSI, environmental surveillance around the Maine Yankee site, regional and national activities, and noteworthy items on the national repository situation.

### 2.1 Independent Spent Fuel Storage Installation (ISFSI)

#### 2.1.1 Annual Inspection

On April 19, the Nuclear Regulatory Commission (NRC) performed an on-site inspection of Maine Yankee's storage facility with two regional inspectors. One inspector reviewed the following programs - Radiation Protection, Emergency Plan, Fire Protection, Surveillances, Environmental Monitoring, and Quality Assurance. The other inspector focused solely on Maine Yankee's security procedures, physical barriers and detection system, compensatory measures, security training and Maine Yankee's response to the NRC's Part 37 regulations to physically protect highly radioactive sources from theft or diversion. Both inspectors informed Maine Yankee at the exit briefing that they would receive two reports and related that they found no

issues, deficiencies, violations, or findings of significance during their inspection. The State Inspector observed the NRC inspection and participated in some of the inspection activities.

### 2.1.2 Annual Drills and Exercises

On an annual basis Maine Yankee is required to perform an emergency plan drill, a radiological drill, a medical drill and a fire drill.

On May 18, Maine Yankee held its annual fire and medical drill. The medical drill portion had to be rescheduled as the Wiscasset Ambulance Service had a real life emergency call at the time of the drill and could not attend. The fire drill scenario involved power equipment that was used extensively during the day shift on the second floor of the Security and Operations Building. A fire started when the lingering heat of the power equipment came in contact with combustibles on the floor, such as wood shavings and sawdust. A Security Officer was dispatched to the scene when a fire alarm went off. The fire escalated when the fire made contact with residual oil on the floor from a slow leak from an overhead crane. The Security Officer attempted to put out the fire with a fire extinguisher, but left the scene when he noticed that he was succumbing to the smoke. Upon leaving the scene, he tripped and fell down the stairs. The fire extinguisher landed on the Security Officer's head leaving him unconscious. The Wiscasset Fire Department was contacted and dispatched at the time of the initial fire alarm. The Fire Department responded and sent in a search and rescue team for the injured Security Officer. The Fire Department then extinguished the fire. During the debrief, two issues were raised, one on the Statewide car to car radio and the other with installing an additional Public Address speaker to stairwell number 2. The car to car radio issue was later deemed to be operator error due to a new dispatcher being unfamiliar with the correct radio and the PA speaker was installed in the stairwell on July 6.

Since the Wiscasset Emergency Medical Service (EMS) was unable to attend the May 18 drill, a tabletop exercise was held on June 9 with the Wiscasset Ambulance staff and the Wiscasset Police Department's new Police Chief. This was done to ensure that the Ambulance Service could have satisfied the medical portion of the drill by demonstrating their capability to transport an injured worker offsite.

On October 5, Maine Yankee conducted its annual emergency plan training with state officials representing the Maine Emergency Management Agency, the State Radiation Control Program, the Maine National Guard Civil Support Team, and the Lincoln County Emergency Management Agency. Training included an overview of the expectations associated with the emergency action levels, who would be notified, and the expected radiation levels near the concrete casks. Also discussed were the projects that were completed this year and planned for next year and Maine Yankee's oil spill reporting criteria to the Department of Environmental Protection (DEP).

On October 19, Maine Yankee conducted an annual emergency plan drill. The scenario involved four armed intruders that gained access to one of the conference rooms within the Security and Operations Building. The intruders requested money and a helicopter. The State Police's Tactical and Crisis Negotiating Teams responded. Prior to their arrival, some of the intruders threw shaped charges over the security fence and damaged one concrete cask. The damage was minor as the on-site radiation levels remained the same. After the Tactical Team set up their perimeter, the State Police Crisis Negotiating Team was able to persuade the intruders to surrender and took them into their custody. After the exercise, some areas for improvement were noted and will be addressed.

### 2.1.3 Daily ISFSI Operations Pass-Ons

The on-shift Security Supervisor forwards the ISFSI Pass-On, three times daily, to the State Inspector. The Pass-On provides an overview per shift of the ISFSI status, the cask monitoring status, procedures/surveillances/work in progress, equipment out of service, alarm issues and team information. It is from these daily reports that the information is collected for condition reports, fire or security related impairments, security incident reports, spurious alarms, and discussed with the ISFSI Manager prior to its disclosure in the State Inspector's monthly reports to the Legislature.

### 2.1.4 Maine Yankee Reports to the Nuclear Regulatory Commission (NRC)

In January, Maine Yankee submitted their third revision to their Post-Shutdown Decommissioning Activities Report to the NRC to reflect the revised cost estimates that were previously forwarded to the NRC on decommissioning and managing the spent nuclear fuel and Greater Than Class C wastes stored at the Wiscasset facility through 2033.

In March, Maine Yankee submitted its yearly "Decommissioning Funding Assurance Status Report" to the NRC. The report estimated that about \$21.6 million would be required to decommission the ISFSI in 2032, when it is assumed that the DOE will remove the spent fuel and Greater Than Class C wastes. According to the report approximately \$29.6 million was available at the end of December 2015. The funds are segregated from the balance of the Nuclear Decommissioning Trust that is used primarily for the ongoing management of the storage facility.

Also in March, Maine Yankee submitted to the NRC their "Funding Status Report for Managing Irradiated Fuel and GTCC (Greater Than Class C) Waste." The report informed the NRC that Maine Yankee had accumulated \$93.3 million at the end of 2015 to cover their managing costs and projected \$167.4 million would be required through 2033. Maine Yankee's report noted that they had three possible options on how to cover their costs. The first involved their investment return on their Decommissioning Trust Fund, which had an assumed rate of return of 4.5% after fees and taxes. Second, they could collect funds from their power contracts and amendatory agreements with other utilities that own Maine Yankee. Finally, they could receive contract damages from DOE for the federal government's failure to take title and possession of the spent fuel in Wiscasset.

In April, Maine Yankee submitted to NRC its biennial report on any changes, tests, or experiments to safety-related structures, systems, or components as described in its Defueled Safety Analysis Report. Maine Yankee informed the NRC that from April 1, 2014, through March 31, 2016, "no changes were made to the facility or the spent fuel storage cask design or procedures, and no tests or experiments were conducted that required the performance of a safety evaluation." In addition, Maine Yankee submitted their annual Individual Monitoring Form 5 Report electronically to the NRC. There were no individuals in 2015 that received a radiation dose greater than or equal 100 mrem<sup>1</sup>. Consequently, no reports had to be sent to individuals in accordance with NRC regulations.

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<sup>1</sup> A mrem or millirem is a conventional unit that is based on how much of the radiation energy is absorbed by the human body multiplied by a quality factor that is a measure of its relative hazard. For a further explanation, refer to the glossary on the Radiation Program's website.

Also in April, Maine Yankee submitted their annual reports for radioactive effluent releases and radiological environmental monitoring. There were no planned or unplanned gaseous or liquid releases from the storage casks. Consequently, no assessment of the radiation dose was required to the most likely exposed person. Since there were no effluent releases from the casks, Maine Yankee was only required to monitor the direct radiation exposure from the facility, which it does with passive devices, called thermoluminescent dosimeters (TLDs)<sup>2</sup>. The environmental monitoring report explained that Maine Yankee has nine TLD stations in the vicinity of the ISFSI and one control station at the Wiscasset Fire Station. All nine stations were comparable to or in some cases slightly higher than the control station. However, there was one station that was noticeably higher than the other eight ISFSI stations. This location has been consistently high since March, 2005. Due to its distance from the bermed area, the higher values were assumed to be due to its line of sight and proximity to the ISFSI. Maine Yankee calculated an annual dose of 1.30 mrem at its highest TLD location, which was much lower than the Environmental Protection Agency's annual public limit of 25 mrem.

In September, Maine Yankee submitted its annual Special Nuclear Material (SNM) Report to the Department of Energy and the NRC. The report represents the material accountability for fissionable material, such as Uranium-233, Uranium-235, Plutonium-238, and Plutonium-239 on U.S. Government owned or non-U.S. owned nuclear fuel between beginning and ending inventories, radioactive decay differences, if any, and receipts of or removals of SNM. The report also includes source material such as natural Uranium and Thorium, and whether the Uranium is normal, depleted, or enriched.

#### 2.1.5 Security Plan

There were no changes to the Security Plan in 2016 that required a submittal to NRC.

#### 2.1.6 Interface with Other State Agencies

##### 2.1.6.1 Interim Spent Fuel Storage Facility Oversight Group

As part of the legislation's mandate, on a quarterly basis, the State Inspector and the Manager of the Radiation Control Program, met with State Police, the Public Advocate, the Department of Environmental Protection (DEP) and Maine Yankee to discuss oversight activities at the ISFSI. The quarterly meeting dates were January 12, April 12, July 19, and October 11. The Manager of the Radiation Control Program distributed the Group's 2015 Annual Report to the Legislature. At the meetings Maine Yankee provided a status of their activities followed by the State Inspector's update of his past, current and planned near term activities such as his participation in three national groups, with one focused on developing recommendations from states to the Department of Energy on emergency preparedness for local communities on spent fuel shipments traversing their jurisdictions, one ad hoc working group on communications, and a rail/routing group in preparation of a national transportation plan and shipment program. Discussions also centered on the Group's annual and financial reports to the Legislature, including the Inspector's initiative to further streamline his monthly reports, national and congressional efforts on spent fuel waste management, especially centralized interim storage at some away facility outside of New England such as Texas and New Mexico who are leading efforts in establishing consolidated interim storage facilities, the status of litigation efforts

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<sup>2</sup> Thermoluminescent Dosimeters (TLD) are very small, plastic-like phosphors or crystals that are placed in a small plastic cage and mounted on trees, telephone poles, etc. to absorb any radiation that impinges on the material. Special readers are then used to heat the plastic to release the energy that was stored when the radiation was absorbed by the plastic. The energy released is in the form of invisible light that is counted by the TLD reader. The intensity of the light emitted from the crystals is directly proportional to the amount of radiation that the TLD phosphor was exposed to.

in the Federal Energy Regulatory Commission rate case settlement cases pending before the federal Appeals Court, the State's environmental radiation monitoring data and its storage exposure assessment of the control TLDs at the State's Health and Environmental Testing Laboratory (HETL). Maine Yankee also informed the Group of the NRC's biennial inspection of the storage facility and no inspection findings, their successful cask lid lift and robotic demonstration project as part of their cask relicensing efforts, the replacement of their fence line radiation monitors, their fence enhancements to prevent wildlife intruders entering the cask area, and the group letter from the Community/Citizen Advisory Panels of Maine Yankee, Connecticut Yankee, Yankee Rowe in Massachusetts and Vermont Yankee to the New England congressional delegation requesting their assistance to break the impasse in Congress on a national solution to the storage and disposal of spent nuclear fuel. The Inspector noted the publication of his article into the Department of Energy's quarterly national newsletter on Maine Yankee's successful summer campaign on chloride testing, cask lid lift and robotic demonstration project. Other topics included Maine Yankee's periodic chemical sampling of 21 wells on-site for the extent of contaminants as part of DEP's Resource Conservation and Recovery Act mandates and their proposal to reduce the number of wells sampled. DEP acknowledged Maine Yankee's proposed well changes and concurred on 14 of the 21 wells proposed for abandonment and capping. The State Police reported that there were no intelligence issues affecting Maine Yankee and that were concentrating on infrastructure issues. They were pleased that their Tactical Team was able to participate in Maine Yankee's emergency preparedness exercise. The Public Advocate's Office remarked that it was preparing for the receipt of federal funds and a hearing in the spring of 2017 on the federal award of \$24.6 million to Maine Yankee for their successful lawsuit against the federal government. They anticipated that some of the funds would be earmarked for the Efficiency Maine Program.

#### 2.1.6.2 Department of Environmental Protection

In March, Maine Yankee informed DEP that it would implement the consensus agreement forged between DEP and its consultant, Ransom Consulting, on which wells and parameters would be monitored and which will not regarding the existing chemical groundwater monitoring program on Bailey Point in Wiscasset. Maine Yankee stated to the DEP that it will amend its Quality Assurance Project Plan and incorporate DEP's preferred test method for petroleum hydrocarbons as opposed to the older test method which DEP no longer uses.

In April, Maine Yankee submitted to the DEP its annual site inspection summary. The report indicated that Maine Yankee had two excavation activities in 2015. The first was on the southeast side of the Operations Building to apply foundation sealer to the foundation wall. The second was on the southwest corner of the Yard Area to replace a microwave foundation. In both instances samples were taken during the excavations and each time no evidence was found of any chemical contamination in the soils.

#### 2.1.6.3 State Radiation Control Program

In February, state officials and Maine Yankee met to discuss the Maine Yankee emergency notification tree. Most of Maine Yankee's notification procedure delineated internal State communications. The State agreed that internal communications during a declared emergency should be governed by the State and not dictated by Maine Yankee. The State seized the opportunity to simplify its own internal notification process.

In May, the State sent a letter to the NRC on their position on Maine Yankee's April 14, 2016 exemption request to the NRC. Maine Yankee expressed concern that a recent Technical Specification (Tech Spec) upgrade would compel them to off-load the entire contents of a cask of spent fuel assemblies should a situation arise whereby the average surface dose rates would exceed the Tech Spec and the design basis accident dose limits at the boundary of the owner controlled area. Maine Yankee postulated that it would take a very unlikely event, such as a "beyond" design basis accident, to force them into this situation. Since Maine Yankee was decommissioned in 2005, it currently has no means to safely remove the spent fuel, transfer it and place it into a safe condition. Because the State believed that the intent of the Tech Spec was to ensure that, when a cask was first loaded onto a concrete pad in the ISFSI, the cask surface dose rates would be within established criteria to meet the NRC's regulatory dose requirements. Additionally, due to Maine Yankee's inability to safely remove the cask contents, the State was supportive of Maine Yankee's exemption request to allow them to return to their original Tech Spec under the cask manufacturer's Certificate of Compliance's Amendment Number 2 to conform to their original loading specifications.

In July, the State observed Maine Yankee's removal of a cask lid on one of the vertical concrete casks that contained the cut up internals of the reactor pressure vessel. Maine Yankee's purpose was to perform some field testing of chlorides to determine the extent of any residual chlorides that may contribute to stress corrosion cracking of the stainless steel canisters that contain the spent nuclear fuel. Additional chloride testing was performed with swipes. All samples collected were sent to a laboratory for further analysis. Maine Yankee exploited this opportunity to use a robotic camera to demonstrate whether or not the technique could be used as an inspection technique for future canister inspections. The camera was inserted in all four top outlet vents and in three of those the camera was inserted the full length (approximately 14 feet) of the canister. The camera footage was recorded. Radiation surveys were also performed with the robot the full length of the canister from three of the four top vents. The highest reading obtained was 89.54 R/hr<sup>3</sup>. Additional camera footage was taken at two of the four bottom inlet vents. Chloride testing was also performed inside the inlet vents. Further chloride testing was performed on two nearby spent fuel vertical concrete casks with chloride testing performed on one inlet and one outlet vent for each spent fuel cask. Again, all samples taken would be sent to an offsite laboratory for further testing.

In September, at the prompting of the Project Director of the Council of State Governments' Northeast High-Level Radioactive Waste Task Force, the SNSI submitted an article on Maine Yankee's cask lid lift and robotic demonstration that was published in the Department of Energy's National Transportation Stakeholders Forum's December 2016 quarterly newsletter. The article, which is reproduced in Appendix D, featured Maine Yankee's efforts to inspect the bolted joint on the cask lid which keeps out unwanted moisture from inside the cask system, the numerous salt testing and samples taken to determine the extent of any salt residue, and the use of a robotic device installed with cameras to visually inspect the inside of the concrete cask liner and the outer surface of the steel canister that contained the high-level waste. Six photos were included to illustrate the lift, the salt testing, and the robotic demonstration.

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<sup>3</sup> A Roentgen per hour (R/hr) is a measurement of a high radiation exposure rate in the air. Typical environmental levels are on the order of one million times lower than this value. For a further explanation, refer to the glossary on the Radiation Program's website.

In October Maine Yankee responded to the State's Low Level Waste Questionnaire for 2015. The company noted that it did not produce or ship any low-level radioactive waste.

## 2.1.7 ISFSI Topics

### 2.1.7.1 ISFSI Status

The status of the ISFSI was normal for the whole year.

### 2.1.7.2 Security Related Incident Reports/Events/Impairments/

Although there were no spurious alarms due to environmental conditions, there were six security-related impairments for the year. There were 56 security incident reports (SIR) logged in 2016 as compared to 72 in 2015. This compares to 44 security events logged (SEL) and 16 SIRs in 2014, 70 SELs in 2013, 145 SELs in 2012 and 142 SELs in 2011. It should be noted that prior to October 2014 Maine Yankee employed a SEL tracking system. Except for the name change, there were no fundamental changes or differences in thresholds between the present and previous tracking systems.

Of the 56 SIRs, which includes the six impairments, nine were related to snow removal, seven were to support maintenance activities, five dealt with camera issues, four had to do with momentary losses of video signals, four included testing of the security detection system, three involved video system maintenance, three were necessary for the replacement of a radiation monitor, two involved the alarm system, two were for troubleshooting and maintenance on a security system, one involved a momentary loss of power, another had to do with a key broken in a lock, another a transient environmental condition, one included a failure of a logged attempt into the computer system, another a maintenance activity in the Security and Operations Building, one had to do with security keys being taken home inadvertently, another the replacement of a video monitor, one involved a security system degradation, another the pre-planned maintenance of a door, the cask lid lift project, the scheduled nuisance fence maintenance project, another the failure of a single security component, one included the security system being out of service during a surveillance testing, another the temporary malfunction of a security system, one involved a detection system issue, and finally environmental conditions causing alarms.

2016 proved to be an exceptional year in that there were no instances of any trespassers, photographers, or suspicious activity that would have prompted follow-up action with the Local Law Enforcement Agencies. Historically, there were five instances in 2015 as compared to four in 2014, three in 2013 to 15 in 2012, six in 2011 versus 15 in 2010 and only two in 2009.

### 2.1.7.3 Fire Related Events/Impairments

One fire-related impairment was reported in 2016 as compared to five in 2015, eight in 2014, ten in 2013, six in 2012, and eleven in 2011. The impairment occurred in June and involved a concrete penetration seal that was temporarily removed to route a small cable through. A fire watch was established during the work period. The fire seal was restored and the work was completed by the end of the shift.

### 2.1.7.4 Condition Reports

There were 182 condition reports (CR) written in 2016 as compared to 223 in 2015, 177 in 2014, 163 in 2013, 184 in 2012, and 80 in 2011. A CR promptly alerts management to potential conditions that may be adverse to quality or safety. An ISFSI facility worker

initiates the CR. The CR prompts management to activate a process to identify causal factors and document corrective and preventative measures. The majority of the CRs are administrative in nature. CRs are wide ranging. Examples include wasp nests inside outlet vents, water infiltrating the Maintenance Building, small hydraulic leaks from contracted and Maine Yankee trucks, computer issues, momentary loss of video signals, reaching the 25% Administration Limit on cask vent flow due to snowstorms to site industrial camera lenses experiencing fogging, tracking observations and recommendations from self-assessments, telephone equipment cooling fans making noise, security keys left inside the locked Armory, the wrong revision to a cover page used on several procedures, an old fence post protruding out of the ground, a diesel fuel spill to pavement, a coyote seen on-site, one of the parking light poles not working, a Fair Point outage of the land line system, finding a fire extinguisher overdue for its hydrostatic testing and an employee leaving their key card at home.

A complete list of CR's can be found in Appendix A. It should be noted that in May of 2012, Maine Yankee consolidated several programs into the CR System as an all-purpose tracking and documentation system. This change explains the sudden increase in CRs and the prevalence of multiple CRs for an issue.

#### 2.1.7.5 Other ISFSI Related Activities

In January, Maine Yankee informed the NRC of a change in their Board of Directors. Two members from the Canadian firm, Emera, were reappointed and replaced with two other individuals from the firm. Because they represent a foreign sponsor company, both individuals had previously signed certifications of foreign sponsor representatives to "ensure that Emera Maine will not exert control, domination, or influence over operational, safety or security matters at Maine Yankee." The previous certifications were still valid.

In February, Maine Yankee submitted to the NRC its annual notification on its foreign ownership, control, or influence status. Maine Yankee described the three separate occasions that member changes were made to the Board of Directors since the last annual notification. One of the changes did not contain a foreign certification since the sponsor company was a domestic corporation. The other two changes involved Emera, a Canadian firm that bought out Bangor Hydro Electric.

In February, Senator King responded to the Chair of the Maine Yankee Community Advisory Panel (CAP) thanking Dr. Donald Hudson for sharing his perspective on the government's handling of the nation's spent nuclear fuel management program. Senator King agreed that the government's approach was untenable and that he wished for a quicker resolution. He noted that he was now a member of the Senate Energy and Natural Resources Committee and would push for the implementation of an interim storage project.

Also in February, NRC issued an exemption to Maine Yankee's Technical Specifications on its cask inspection requirements for the inlet and outlet vents following off-normal, accident, or natural phenomena events. However, the NRC limited the scope of the events covered to specifically snow and icing events. Since the exemption met the categorical exclusion requirements of NRC's regulations, no environmental assessment and finding of no significant impact were issued.

In April, Maine Yankee submitted to the NRC an exemption request from their cask Technical Specifications. The request was on a very specific exemption from a one-time requirement on measuring the concrete cask average surface radiation dose rate when the casks were first loaded onto the concrete pads in the ISFSI. Maine Yankee performed the requirement under Amendment Number 2 of the NRC's Certificate of Compliance (CoC) for the casks, which required the surface radiation measurements to be performed during loading operations but prior to commencing storage operations. In 2011, in order to maintain current with the cask manufacturer's requirements, Maine Yankee adopted Amendment Number 5 to the NRC's CoC. Unbeknownst to Maine Yankee, one of the specific Tech Spec changes now required that the radiation surface measurements be performed during storage operations. Since Maine Yankee was now in storage operations, the NRC recently queried Maine Yankee on how it would meet this radiation requirement. With the casks in storage for over ten years with declining surface radiation dose rates and spent fuel heat loads, there were no credible events that could trigger the Tech Spec requirement, unless there was a beyond design basis accident. In such a very unlikely event where the concrete cask was compromised so that surface dose rates exceeded the Tech Spec requirement, Maine Yankee would be required by their Tech Spec to remove all the fuel assemblies from the cask within 30 days. Since Maine Yankee was decommissioned in 2005, it currently has no means to safely remove the spent fuel, transfer it and place it into a safe condition. Consequently, Maine Yankee was requesting the NRC to allow them to return to their original Tech Spec Amendment Number 2 to conform to their original loading specifications.

In May, the NRC staff informed Maine Yankee that they had received Maine Yankee's April 14, 2016 letter requesting an exemption from specific licensing requirements of an independent spent fuel storage facility and that there was adequate information for them to perform their evaluation.

In September, the SNSI provided a yearly update to Maine Yankee's Community Advisory Panel on Spent Nuclear Fuel Storage and Removal of his activities as part of his oversight function of the Maine Yankee storage facility in Wiscasset. The highlights of the overview included the status of the monthly and annual reports to the Legislature, participation in the Council of State Governments' Northeast Radioactive Waste Transportation Task Force and the DOE's National Transportation Stakeholders Forum (NTSF), participation in three national Ad-Hoc Working Groups for DOE's NTSF, NRC's biennial inspection of the Maine Yankee storage facility, Maine Yankee's cask lid lift and robotic demonstration, submission for publication of an article with photos on the cask lid lift and robotic demonstration project to DOE's NTSF newsletter, assessment of the radiation dosimeter controls for Maine Yankee, webcasts of national dialogue on consent-based siting for storage and disposal facilities for spent nuclear fuel, and attendance at DOE's meeting with Wiscasset officials and the public.

In September, at the urging of the NRC, Maine Yankee withdrew their exemption request on reinstating their initial Technical Specifications requirement on the concrete cask average surface dose rate from Amendment Number 2 of their Certificate of Compliance, which specified a one-time radiation measurement during loading operations as opposed to the current Amendment Number 5, which required the surface measurement to be performed during storage operations.

In October, Sandia National Laboratories published a report, entitled "Analysis of Dust Samples Collected from an In-Service Interim Storage System at the Maine Yankee Nuclear Site." The report presented the results from the dust samples that were collected last summer from the cask lid lift and robotic demonstration project. The samples included sponges and filter papers. Both were wetted to extract soluble salts from some of the surfaces. The filters collected both particles and salt while the sponges collected only soluble salts. The chemical analysis on the filter papers showed that the salts were high in calcium, sodium, sulfates, chlorine, with lesser amounts of potassium and minor amounts of magnesium and nitrates. The sponge samples' composition was similar to the filter papers. The salts represented a mixture of sea salts. The qualitative results appeared to be consistent, indicating that representative salt samples were collected. The sampling and robotic demonstrations were considered a success.

In November, Marge Kilkelly, Senior Policy Advisor to Senator Angus King, presented to the Wiscasset Board of Selectman a proposal to form an alliance with 13 other communities across the country storing spent nuclear fuel as an information-sharing network. The proposal would also include a transportation infrastructure analysis surrounding each storage facility to decide how to move the spent fuel to a permanent site. The Board did not immediately vote on the proposal.

Also in November Maine Yankee submitted to the NRC revision 36 of its Quality Assurance Program (QAP). The revisions were considered administrative improvements. One change was referred to an additional section of the QAP and the other, instead of referring to the Defueled Safety Analysis Report, defined the ISFSI pads as a Quality Category C component.

In December, Maine Yankee paid the federal government the full amount it owed, \$186.4 million, from the State's Spent Fuel Disposal Trust Fund for its pre-1983 spent fuel obligation, as mandated by the federal Nuclear Waste Policy Act of 1982. Under the Act, the Nuclear Waste Fund was established to construct and operate a geologic repository for the disposal of spent nuclear fuel and high level radioactive waste by assessing a fee of 0.1cents per kilowatt-hour generated by nuclear utilities starting in 1983. Prior to 1983, the Act allowed utilities to either pay their pre-1983 nuclear generation obligation or wait until the DOE fulfilled its obligation to begin removing the spent nuclear fuel or at some time prior to that of the utilities choosing.

Also in December, the DOE's National Transportation Stakeholders Forum featured in its national newsletter an article on Maine Yankee's cask lid lift project and a demonstration of a first of its kind robotic camera system to inspect dry storage canisters. Maine Yankee undertook the cask lid lift as part of its aging management program and in preparation for its upcoming license renewal application submittal to the NRC in 2020. Both the lid lift and the robotic demonstration were successful. Very little moisture and surface salt was found underneath the lid and in the vents, and the robot was able to move up and down the entire 14 foot length of the canister from three of its four top vents.

## 2.2 Environmental

### 2.2.1 Radiological Environmental Monitoring Program (REMP) Description and Historical Perspective

Since 1970, the State has maintained an independent, radiological environmental monitoring program of the environs around Maine Yankee. An extensive quarterly sampling and analysis program has been maintained over the years that included such media as salt and fresh water, milk, crabs, lobsters, fish, fruits, vegetables, and air. Since the decommissioning, the State's program has been reduced twice to accommodate decreased funds for sample analyses at the State's Health and Environmental Testing Laboratory and the decreased likelihood of any contaminating event from the Maine Yankee site.

In late December 2009, after 39 years, the State ceased its air sampling station at the Maine Yankee site. In reviewing the historical air data and taking into account the leak tightness of the spent fuel casks, it was determined that there was no technical basis to continue the air monitoring location at the old Bailey Farm House. Although the air sampling station at Maine Yankee was discontinued, the State still maintains an active air sampling station on the roof of the Health and Environmental Testing Laboratory that acts as a control for comparative purposes during Maine Yankee's operating and decommissioning years. The State's air sampler at HETL is also available for radioactive fallout situations from national or global events. That proved to be instrumental in the quantifying of the impact from the Fukushima reactor accidents in March and April of 2011.

In June of 2010, the State performed another review of its Radiological Environmental Monitoring Program at the Maine Yankee site. The review determined that the quarterly surveillance sampling of freshwater at Ward's Brook in Wiscasset, and the seawater and seaweed sampling at the Ferry Landing on Westport Island would be discontinued permanently after 40 years. Both sampling stations were originally set up to monitor gaseous and liquid releases from Maine Yankee. Because the ISFSI does not release gaseous or liquid radioactivity and adequate time had elapsed since the power plant was decommissioned in 2005 for statistical comparisons, there was no further technical justification for the continued sampling of the media at these stations.

In addition to the media sampling, over the years the State has maintained a robust TLD program to measure the radiation environment. The TLDs were initially placed within a 10 to 20 mile radius of the plant to measure the background radiation levels. Later, when the plant was operating, the initial results could be used as a baseline to compare with the TLD values recorded during the plant's operating years. Over time the number of TLDs more than doubled to over 90 to address public concerns over the clam flats in Bailey Cove after the steam generator sleeving outage in 1995-1996 and later, the construction of the ISFSI.

Although most of the REMP changes took place in prior years, in 2010 the State also implemented further reductions in the TLDs not only in the vicinity of the former nuclear power plant, but also in Bailey Cove. Of the nine remaining TLDs beyond the site's boundary, six were permanently discontinued after the second quarter's field replacement. The remaining three TLDs consisted of three controls, (one locally at the Edgecomb Fire Station, one near the site at the Ferry Landing on Westport Island, and one farther away on the roof of the State's Health and Environmental Testing Laboratory). At the time, this left 27 TLDs for the ISFSI and Bailey Cove. However, in late December of 2010, a final assessment was performed to consolidate the number of TLDs monitoring the ambient radiation levels near the ISFSI. Eight of the fourteen

TLD locations from Bailey Cove were removed from the monitoring program. Of the remaining six Bailey Cove TLDs, four were reassigned as ISFSI TLDs to ensure coverage for the sixteen points of the compass. The four new stations were identified as N, O, P, and Q. The last two Bailey Cove stations were co-located with the State's solar powered environmental radiation monitors on the Maine Yankee site. The TLD changes went into effect in the first quarter field replacement in January 2011.

## 2.2.2 Thermoluminescent Dosimeters (TLDs)

As outlined in the historical context and as part of its independent oversight, the State maintains a TLD program to measure the quarterly ambient radiation levels at Maine Yankee, both in proximity of the ISFSI and at various locations within a five mile radius. At the beginning of the year, the State's TLD program was focused on two areas - the ISFSI and its controls. The exceptions are the two co-located TLDs with the solar powered units. A future assessment on maintaining the solar powered units may be considered.

### 2.2.2.1 ISFSI TLDs

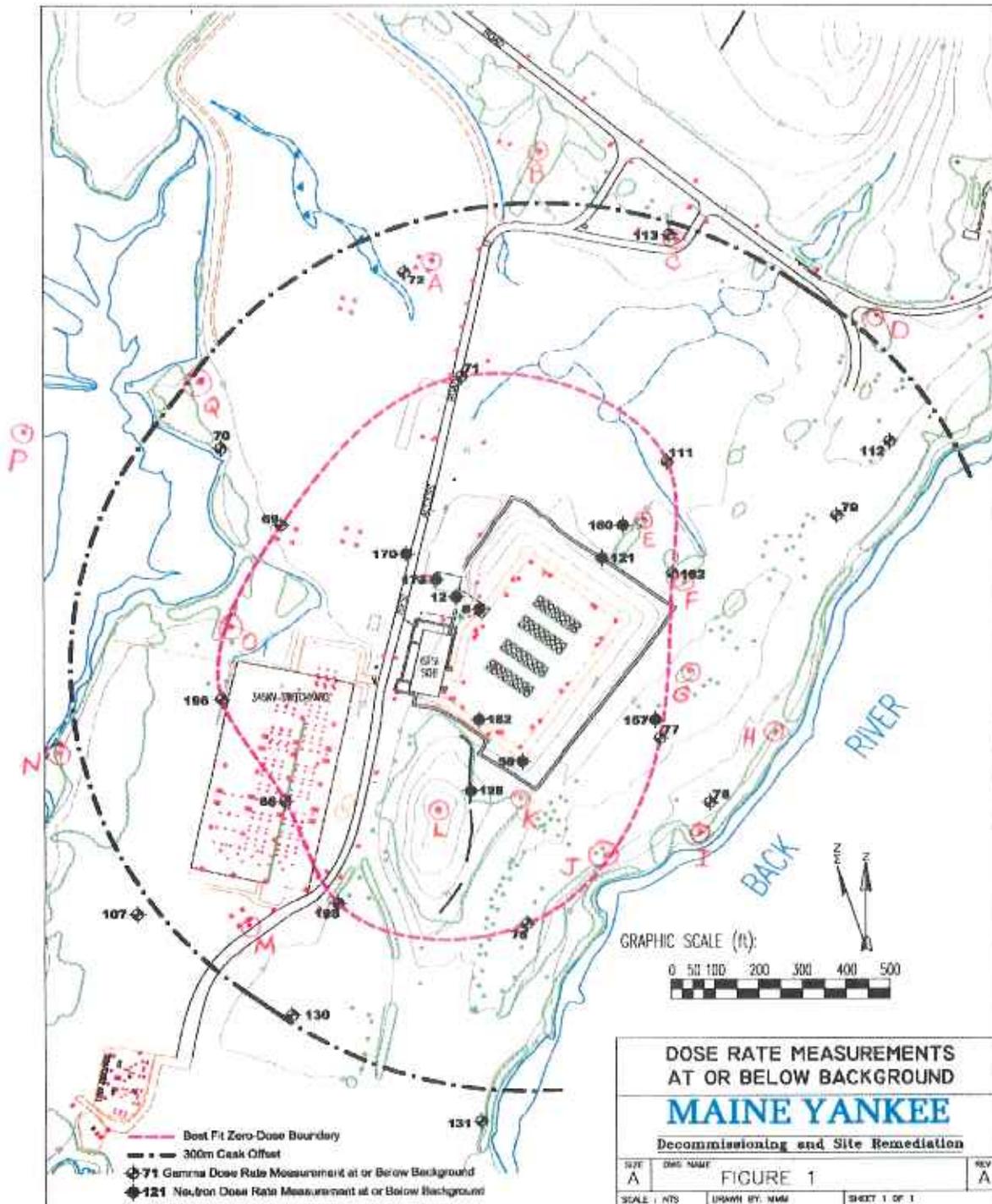
In October of 2000, in preparation for the spent nuclear fuel to be moved from the fuel pool and stored in concrete casks at the ISFSI, the SNSI, as part of his independent oversight, established 13 TLD locations to monitor the local radiation levels from the ISFSI. Since the spent fuel was projected to be moved in the fall of 2001, it was necessary to perform monthly TLD field replacements as opposed to quarterly in order to gather enough field data to establish a pre-operational baseline. The monthly regimen was converted to a quarterly frequency in the fall of 2004 after all of the spent nuclear fuel was transferred from the pool to the ISFSI in February of 2004.

Initially, some of the state TLD locations were co-located with some of Maine Yankee's TLDs for future comparative purposes. In 2008, Maine Yankee reconfigured its TLD locations leaving 2 stations co-located. Since then, some additional repositioning was made that resulted in only station M being co-located. To acquire statistical weighting for each location, two TLDs were placed at each location. Each TLD has three plastic-like phosphors that capture radiation.

As noted in the historical perspective earlier, the current seventeen locations are identified by the letters A through Q in Figure 1, (courtesy of Maine Yankee), on page 15 and Table 1 on page 16 listing the State's ISFSI results for the year. The average represents the mean of the six element phosphors and the range depicts the low and high values for the six crystals.

The ISFSI TLDs continued to demonstrate three separate groupings when it came to dose: elevated, slightly elevated and normal. Stations G and K continued to be high due to their proximity to the ISFSI. However, Station F was also in the elevated grouping in the first, third, and fourth quarters with station Q also elevated, except for the second, third, and fourth quarters. In addition, stations B and E were elevated in the third quarter while station L was elevated in the fourth quarter. Both stations E and F are located north of the ISFSI's bermed area near the old East Access Road. Station L is on top of the knoll south of the ISFSI. Station Q has historically been in the slightly elevated grouping with occasional periods in the elevated grouping. The location of Station Q is on top of a man-made ridge of rocks abutting the east side of Bailey Cove. The composition of the rocks natural radioactivity may explain the higher readings in comparison to other stations.

Figure 1



The results in Table 1 also clearly demonstrate the slightly elevated grouping of such Stations as E, F and L showing signs of influence from the ISFSI as seen in Figure 1 by their short distances from the ISFSI. Except for the elevated and slightly elevated groups, the remaining fourteen on-site stations exhibit normal background levels of radiation. At times, some of the stations may be grouped into the higher groupings, it is usually transitory, lasting in most cases for only one quarter. The radiation levels from the elevated (G and K) and the slightly elevated stations (E, F and L) are still fairly low with their levels rarely exceeding 40% of the other fourteen background stations.

Table 1 – ISFSI TLD Results

TLD Stations	Quarterly Exposure Period							
	1 <sup>st</sup> Quarter (Winter)		2 <sup>nd</sup> Quarter (Spring)		3 <sup>rd</sup> Quarter (Summer)		4 <sup>th</sup> Quarter (Fall)	
	Average (Range) (mrem)		Average (Range) (mrem)		Average (Range) (mrem)		Average (Range) (mrem)	
A	20.7	(20-21)	24.8	(22-28)	24.7	(23-29)	24.5	(22-28)
B	19.8	(19-20)	24.3	(23-25)	24.7	(24-25)	25.2	(24-26)
C	20.2	(19-21)	23.8	(22-27)	24.0	(23-25)	25.7	(25-26)
D	20.5	(20-22)	26.0	(24-28)	24.3	(23-26)	25.8	(24-28)
E	21.0	(20-22)	25.5	(24-27)	26.0	(23-27)	27.7	(27-29)
F	23.7	(21-26)	26.2	(25-27)	26.8	(26-29)	28.5	(27-29)
G	24.7	(24-27)	28.7	(27-31)	27.2	(26-29)	30.3	(28-35)*
H	19.2	(19-20)	23.3	(21-25)	21.3	(20-23)	25.5	(25-26)
I	20.0	(19-21)	25.5	(21-30)	22.3	(20-24)	26.2	(25-29)
J	21.0	(18-25)	24.7	(23-26)	22.7	(21-24)	27.7	(27-30)
K	25.5	(23-29)	27.8	(26-31)	26.7	(25-28)	29.8	(29-30)
L	21.3	(19-22)	26.8	(23-27)	24.5	(23-27)	30.5	(27-38)*
M	20.8	(20-22)	25.5	(23-27)	24.3	(23-26)	27.2	(26-28)
N	19.2	(18-20)	23.0	(22-24)	21.2	(20-22)	26.5	(25-27)
O	20.8	(20-21)	26.0	(24-32)*	24.7	(23-26)	27.7	(26-29)
P	19.7	(18-21)	24.8	(23-31)*	22.3	(22-23)	24.2	(23-27)
Q	22.5	(22-23)	27.2	(26-29)	27.8	(26-33)*	28.7	(28-30)

\* These stations had one data point that was considered an outlier that could have been rejected at the 95% confidence level. Only stations O and Q had data that could be rejected at greater than the 99% confidence level. The State will not consider rejecting any data unless the statistical test exceeds the 99% confidence level. Even though the State could have rejected two data points, it opted to retain all the questionable data.

The data normally validates the seasonal variation with the fall and winter values generally decreasing when the ground is frozen and covered with snow as it impedes the out gassing of the Radon gas from the soils. The deeper the snow cover is the more pronounced the decrease in the natural radiation levels. However, the seasonal fluctuations this year were very unusual. Instead of the normal low in winter with a high in the summer and declining values in the fall, the peaks this year were in the spring and fall with the fall values being more pronounced. The higher values were not related to

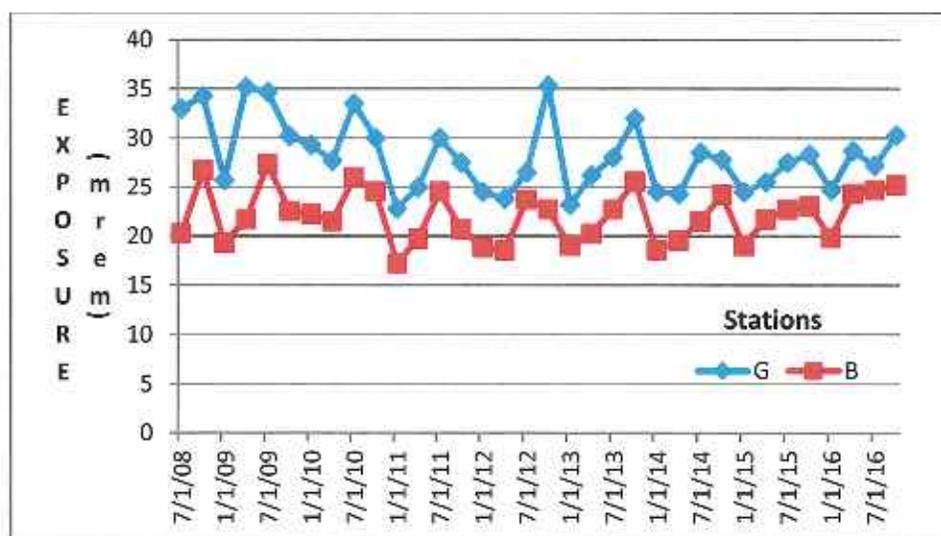
higher cosmic activity as the sun spot cycle was actually decreasing to an eight year low. Last year was an unusually dry year with localized drought conditions which may have accelerated the expected Radon outgassing that normally takes place in the summer for the spring, but it may not explain the higher than expected values for the fall as December experienced above normal precipitation. With above average precipitation and colder conditions, the expectation would have been to have lower values due to the impediments to Radon out gassing.

There appeared to be a lot of variability in results this year with competition between the spring and fall results as to what quarter was highest. Fourteen of the seventeen stations in the fall had higher values than the spring. Additional variability was also noticeable given that five stations had higher upper range values than normally expected and were denoted with asterisks. The variability was also noticeable in that there were five stations over the course of the year that had potential outliers. For example, both stations O and P in the second quarter could have been rejected at the 99% and 95% confidence levels, respectively. Neither of the two stations' data was rejected by the vendor or the State. Similarly, station Q for the third quarter could have been rejected at the 99% confidence level by the vendor or the State, but was not. As for stations G and L in the fourth quarter, both stations could have been rejected at the 95% confidence level. Even though the high values were rejected by the vendor as outliers, the State did not reject and maintained both results as part of the database.

It should also be noted that the values listed in Table 1 are the total readings from the vendor. Neither the vendor nor the State employ any corrections for exposures to the TLDs due to shipping from California to Maine and their return shipment to the vendor for evaluation, or for storage at the vendor and State offices prior to their use in the field.

Figure 2 below illustrates the difference between the elevated Station G and a normal Station B. The Station G data, which is impacted by the ISFSI, portrays a slightly downward trend over time as would be expected from material that is experiencing radioactive decay, whereas Station B, which is not influenced by the ISFSI, depicts a more stable or flat response with time which is more indicative of a background station.

Figure 2 – TLD STATIONS



### 2.2.2.2 Transit Controls

Since the values over-inflate the true ISFSI dose, the State embarked on a program to better quantify the transit and storage exposures that are not part of the true field exposure and therefore, the ISFSI's impact. The SNSI determined that a minimum of three years was necessary to gather enough quarterly data to develop the statistical power for assigning correction factors. Once these variables are quantified, then the State could employ the correction factors to its results.

The preliminary findings over the past four years indicate that the 10 day transit exposures for the TLDs may range from about 5 to 8 mrem with an estimated average of 6.5 mrem, which is significant when compared to the total values reported in the TLD tables. The transit or shipping exposures alone represent upwards of 20 to 40% of the dose reported. The results indicate that virtually all the transit data for the last four years fell within the range of the 95% confidence level. Therefore, the State has a high degree of confidence on the transit exposure.

Table 2 below illustrates the transit control results for the past four years.

Year	1 <sup>st</sup> Quarter	2 <sup>nd</sup> Quarter	3 <sup>rd</sup> Quarter	4 <sup>th</sup> Quarter
2012	7.1	5.7	6.4	14.5 (15.3)
2013	8.5	4.8	5.5	11.9 (7.1)
2014	7.6	7.0	6.9	5.9
2015	5.8	6.3	6.2	7.1

Since starting on this program in 2012, the fourth quarter results were at least twice the average of the three previous quarters. There appeared to be an obvious effect occurring in the fourth quarter. When queried, the TLD vendor was unable to explain the increases. The vendor reviewed the individual data and examined the crystals and could not find a reason for the additional exposures.

The 2012 fourth quarter value was much higher than expected. Possible explanations could include a longer transit time, longer storage in an area with a higher than average radiation background, or exposure either in transit or storage to a nearby radioactive package. However, the 2013 fourth quarter exposure was attributed to the storage of the TLDs. Six of the seven controls were held for an extra 27 days at the TLD vendor processor in California. The difference between the six TLDs held longer and the one control that was processed later amounted to 4.8 mrem. That is why all the TLDs, except for this one control, had higher fourth quarter readings.

For the last two years, the fourth quarter results were not higher as was experienced in the previous two years when adjustments were computed to demonstrate the resultant skewed seasonal variations. As compared to the previous two years, the fourth quarter transit badges were not returned immediately to the TLD vendor for their evaluation, but inadvertently kept in the storage vault at the State's Health and Environmental Testing

Laboratory along with the other controls. Even though there was no apparent explanation for one of the higher values, there was also no obvious explanation why the fourth quarter results were back to normal. Consequently, no adjustments were necessary to illustrate the expected seasonal variations.

#### 2.2.2.3 Storage Vault Controls

Because the State had a better understanding for the TLD transit exposure and what to expect for exposures, it shifted its attention to the final unknown, the storage exposure within the steel vault at the State’s Health and Environmental Testing Laboratory. The exposure determination will take about two years to complete with exposure measurements taken every six months. Two sets of measurements have been collected to date, with an additional six sets expected over the next year and a half.

#### 2.2.2.4 Bailey Cove TLDs

The Bailey Cove surveillance is a remnant of the operating days when the public had raised questions over the radiation levels in the Cove and its impact on clam and worm diggers from the extended shutdown due to the steam generator sleeving project in 1995. The number of TLD locations was reduced in January of 2008 from the initial 40 that covered both sides of Bailey Cove down to 14 and eventually down to 2 at the beginning of 2011. The TLD results for Bailey Cove for 2015 are illustrated in Table 3 below.

TLD Stations	Quarterly Exposure Period							
	1 <sup>st</sup> Quarter (Winter)		2 <sup>nd</sup> Quarter (Spring)		3 <sup>rd</sup> Quarter (Summer)		4 <sup>th</sup> Quarter (Fall)	
	Average (Range)		Average (Range)		Average (Range)		Average (Range)	
	(mrem)		(mrem)		(mrem)		(mrem)	
1	20.8	(19-22)	25.7	(22-30)	20.8	(20-22)	24.8	(22-28)
2	21.2	(19-23)	27.5	(24-32)	22.8	(21-25)	25.3	(25-26)

As with the ISFSI, the Bailey Cove TLDs experienced the same unusual variability with the peaks occurring in the spring and fall for all the TLDs, as compared with the natural expected seasonal fluctuations due to Radon excursions associated with weather conditions and seasonal effects, such as frozen ground and snow cover.

The Bailey Cove values are fairly comparable to the ISFSI results for the normal group. The background values remain typical for the coast of Maine, which can range from 13 to 25 mrem, with the lower values indicative of their proximity to the water’s edge. This effect is very evident at high tide with the water acting as a shield covering the natural radioactivity from the rocks and mud flats that are under water.

#### 2.2.2.5 Field Control TLDs

There are three field controls utilized by the State for comparative purposes (Refer to Table 4). All three are located off-site and beyond Maine Yankee’s Controlled Area of about 290 meters (approximately 950 feet). The closest is Station 110, Ferry Landing on

Westport Island, which is about 3 quarters of a mile from the ISFSI. The second control, Station 143, is located at the Edgecomb Fire Station, about three and a half miles away. The last control, Station 160, is the traditional one located on the roof of the State's Health and Environmental Testing Laboratory in Augusta, more than 21 miles away.

As with the ISFSI and Bailey Cove TLDs, the field controls experienced the same seasonal fluctuations due to Radon excursions associated with weather conditions and seasonal effects, such as frozen ground and snow cover. However, as previously noted, the seasonal fluctuations this year were unusual and exhibited some variability with the peaks occurring in the spring and fall.

Table 4 – Field Control TLD Results

TLD Stations	Quarterly Exposure Period							
	1 <sup>st</sup> Quarter (Winter) Average (Range) (mrem)		2 <sup>nd</sup> Quarter (Spring) Average (Range) (mrem)		3 <sup>rd</sup> Quarter (Summer) Average (Range) (mrem)		4 <sup>th</sup> Quarter (Fall) Average (Range) (mrem)	
110	21.3	(20-23)	27.2	(23-31)	23.5	(22-26)	28.2	(27-30)
143	23.5	(21-26)	31.5	(29-35)	27.0	(26-30)	28.3	(27-29)
160	19.8	(18-21)	28.5	(26-32)	20.3	(18-23)	23.7	(23-25)

### 2.2.3 REMP Air Filter Results

#### 2.2.3.1 State's Health and Environmental Testing Laboratory Roof Sampler

Table 5 below illustrates the quarterly air sampling results for the year.

Table 5 – HETL Air Filter Results\*

Positive Results	Quarterly Sampling Period			
	1 <sup>st</sup> Quarter (fCi/m <sup>3</sup> ) <sup>4</sup>	2 <sup>nd</sup> Quarter (fCi/m <sup>3</sup> )	3 <sup>rd</sup> Quarter (fCi/m <sup>3</sup> )	4 <sup>th</sup> Quarter (fCi/m <sup>3</sup> )
Gross Beta** (range)	(17.0 – 25.1)	(11.9 – 29.6)	(21.1 – 28.4)	(16.5 – 29.8)
Quarterly Composite (Be-7)	71.8	90.2	84.1	70.3

\* Control located on the roof of the State's Health & Environmental Testing Laboratory (HETL).  
 \*\* Gross Beta is a simple screening technique that measures the total number of beta particles emanating from a potentially radioactive sample. High values would prompt further analyses to identify the radioactive species.

The State's Health and Environmental Testing Laboratory analyzed the samples and employed various analytical methods to measure specific radioactive elements. All the

positive results reported highlight naturally occurring background levels and ranges in units of femto-curies per cubic meter (fCi/m<sup>3</sup>)<sup>4</sup>.

The only detectable radioactive element was Beryllium-7 (Be-7)<sup>5</sup>, which is naturally occurring. It is a "cosmogenic" element, which means it is continuously being produced from the high-energy cosmic rays bombarding the oxygen, carbon and nitrogen molecules in the upper atmosphere.

## 2.3 Maine Yankee Decommissioning

### 2.3.1 Background

The Maine Yankee plant was decommissioned over an eight year period which started in 1997 and was completed in the fall of 2005. At that time, the SNSI also commenced his final walk down survey of the site with a special emphasis on the transportation routes exiting the plant site, including both half-mile east and west access routes and the two thirds of a mile of the railroad track. In addition, nine specific areas, including the dirt road, were also examined as part of the final site walk down survey. With the discovery of three localized, elevated contaminated areas on the dirt road, further work was performed to bound the contamination. No new contamination was found and the State closed the issue in October of 2008. Even though some residual radioactivity remains, due to the localized nature of the contaminants and the restricted security access to the site, the contamination found did not present a public health threat.

With the closure of the Dirt Road, the only walk down survey remaining on-site was a roughly 600 foot section of the East Access Road adjacent to the ISFSI bermed area. The SNSI performed a final survey of the road in May of 2011. With the closure of the East Access Road survey, the State had officially ceased all its decommissioning survey activities pertaining to Maine Yankee.

In 2014, the State disposed over 1,000 decommissioning samples and moved over 150 boxes of archived documents that were in storage, pending the completion of the State's Confirmatory Summary Report on its decommissioning findings. The forced disposition was brought on by the sale of the storage building and the new owner wanting the storage space.

### 2.3.2 Confirmatory Report

A final draft of the State's verification measurements and findings from the decommissioning was completed and the Confirmatory Summary Report is under final management review.

## 2.4 Reports to the Legislature

### 2.4.1 Monthly

As mandated by legislation passed in the spring of 2008, the SNSI is required to submit monthly reports to the Legislature on its oversight activities of Maine Yankee's ISFSI located in Wiscasset. Since the law went into effect on June 29, 2008, the SNSI has provided monthly reports to a distribution that includes the President of the Senate, the Speaker of the House, the

<sup>4</sup> fCi/m<sup>3</sup> is an acronym for a femto-curie per cubic meter. It describes a concentration of how much radioactivity is present in a particular volume of air such as a cubic meter. A "femto" is a scientific prefix that is equivalent to one quadrillionth (1/1,000,000,000,000,000).

<sup>5</sup> Radioactive elements are usually represented by their chemical symbols and corresponding mass numbers. The mass number represents the total number of protons and neutrons in the nucleus of an atom. For Beryllium-7 the chemical symbol is Be and the mass number is seven with four protons and three neutrons in the nucleus.

NRC at their headquarters in Rockville, Maryland and NRC's Region I in King of Prussia, Pennsylvania, Maine Yankee, the Governor's Office, the Department of Health and Human Services, the Department of Environmental Protection, the Public Advocate and the State Police's Special Services Unit. The topics covered in the monthly reports are highlighted in sections 2.1.7, 2.2, 2.3, and 2.5 of this report.

In 2012, the monthly report format and distribution method were changed. To minimize the size of the reports along with their attachments, the SNSI published the reports in electronic format which included internet hyperlinks for each of the attachments. This provided flexibility for reviewers and greatly reduced the volume of paper used for distributing the reports. Hard copies of the reports are maintained at the Commissioner's Office and the SNSI's Office.

After the 2014 soil sample disposal project seriously delayed the 2014 monthly reports, the SNSI was able to issue the February through August reports and started on the September report by the end of 2014. All the 2014 reports were caught up by March 2015. By the end of 2015 the SNSI had completed the November report and had started working on the December report. Although the SNSI's monthly reports were nearly caught up at the end of 2015, the management reviews were backlogged. A commitment was made to the Commissioner to complete the internal reviews and submit the backlog reports to the Commissioner's Office as per the following schedule:

- o Forwarded the September through December 2014 reports by January 19, 2016,
- o Forwarded the January through October 2015 reports by January 30<sup>th</sup>,
- o Forwarded the November and December 2015 reports by February 19<sup>th</sup>, and
- o Committed to finalizing monthly reports by the end of the following month to the Commissioner's Office.

The above schedule was met. Since then, the reports have essentially been submitted on time to the Commissioner's Office.

The SNSI instituted another report format change in November of 2016 to expedite the review process. The format for the reports was changed to reflect only the local and national highlights. Previous information such as condition reports, ISFSI related activities, environmental surveillance results, and noteworthy items would be captured in the annual activities report due in July.

#### 2.4.2 Annual

Under 22 MRSA §668, as enacted under Public Law, Chapter 539 the SNSI prepares an annual accounting report of all the funds received into and all disbursements out of the Interim Spent Fuel Storage Facility Oversight Fund. This report is due the first Monday of February. In addition, the SNSI must annually report its activities to the Department of Health and Human Services' Manager of the Radiation Control Program for inclusion in the Manager's Annual Report of Oversight Activities and Funding to the Legislature. In addition to the above annual reports, the SNSI also prepares an annual report of his oversight activities that is due by July first of every year to the Legislature. The 2015 annual report was submitted for management review in June 2016 and issued by the Commissioner's in September 2016. The submittal of the 2015 report fulfilled the legislative mandate for July 1, 2016.

### 2.5 Other Activities

#### 2.5.1 Northeast High-Level Radioactive Waste Transportation Task Force (NEHLRWTF)

As the State's representative the SNSI has participated in periodic conference calls on the status of Yucca Mountain and transportation issues that could impact Maine. The Task Force normally meets twice a year, depending on funding resources. One meeting coincides with the DOE's annual National Transportation Stakeholders Forum (NTSF) in the spring, and the other in the fall.

In early June, the DOE held its seventh annual NTSF meeting in Orlando, Florida. The SNSI attended the DOE Forum, which highlighted DOE's status reports on environmental management, packaging, transportation, and the nuclear fuels storage project; the national laboratories involvement in security tracking and monitoring of transportation shipments; state and tribal perspectives and expectations on spent nuclear fuel shipments; federal, state, and tribal training and exercises to support a transportation incident response; NRC safeguards guidance on security sensitive information; and testing and certification for spent nuclear fuel transportation containers. Other topics included the status of the Waste Isolation Pilot Project recovery, tools for informing states, tribes, and the public about consent-based siting, stakeholders' perspectives on the transportation of low-level radioactive waste to the Nevada National Security Site, and a discussion on federal and state occupational disciplines for railroad safety inspectors.

The Forum also allowed the national Ad Hoc Working Groups on the Nuclear Waste Policy Act's Section 180 (c) on emergency preparedness for first responders, information and communications, the spent nuclear fuel rail routing group, and the four regional groups to meet and discuss their respective regional issues. The Northeast Regional Task Force focused on its state reports and participation in the national working groups. The SNSI provided a report to the Northeast Task Force on Maine's activities and his participation and involvement in three national working groups on the future state funding for spent fuel shipment emergency preparedness training, on information and communication activities, and spent fuel rail/routing efforts. The Task Force also heard several presentations on such topic areas as an update of three Yankces (Connecticut Yankee, Maine Yankee, and Yankee Rowe) and their successful litigation efforts against the federal government, a DOE regional training update, National Nuclear Safety Administration's status of its preparations for the foreign fuel shipments, and DOE's site visit to Vermont Yankee to gather information on the transportation infrastructure available for shipping spent nuclear fuel.

In November, the Task Force met in Atlantic City, New Jersey. The Task Force Director provided an update of his coordination activities with the NTSF working groups and the other three regional groups, a status of the Task Force's cooperative grant with DOE, and a discussion on communication to public, state officials, and legislators. Other topics included Maine Yankee's presentation on its cask lid lift and robotic demonstration, received updates from DOE's Offices of Nuclear Energy and Environmental Management, a cask transportation package performance assessment by Sandia National Laboratories, and a tribal perspective on transportation. The Task Force later compared the 2006 National Academy of Science's thirteen recommendations on transportation of spent nuclear fuel and high-level nuclear waste with the 2012 Blue Ribbon Commission's assessment of those recommendations and assigned each recommendation. The Task Force then assigned specific working groups and federal agencies to develop or monitor the activities associated with the recommendations.

The Task Force is an affiliate of the Eastern Regional Conference of the Council of State Governments. The purpose of the Task Force is to not only develop the safest and most efficient transportation route to ship spent nuclear fuel from the Northeast, but also to provide the States with direct involvement in formulating and establishing national policy in the design of a

national transportation system and development of any proposed geologic repository or consolidated interim storage facility. The Northeast Task Force is comprised of representatives from the six New England states, New York, Pennsylvania, New Jersey, and Delaware.

### 2.5.2 Yankee Federal Energy Regulatory Commission (FERC) Rate Case Settlement

The State participated in quarterly conference call briefings relevant to Yankee Rowe, Connecticut Yankee and Maine Yankee. The briefings provide updates to both state and private officials affected by the FERC settlements on the federal lawsuits over DOE's breach of contract to take possession of the spent fuel at Maine Yankee as mandated by the Nuclear Waste Policy Act of 1982, as amended in 1987. Maine Yankee was awarded \$24.6 million in 2016 as compared to \$35.7 million in 2013, and \$81.7 million in 2012.

In addition to the lawsuits, updates are also provided of other organizational activities, both on the regional and national levels, on spent fuel issues, whether they be the Yucca Mountain repository or focusing attention on local or centralized storage with Texas and New Mexico competing for storing the nation's nuclear stockpile, extended storage, legislation or appropriations, or efforts to implement the President's Blue Ribbon Commission's recommendations. These organizations include the White House, the Energy Department, the Blue Ribbon Commission on America's Nuclear Future, the NRC, Congress, the National Conference of State Legislatures, the Nuclear Waste Strategy Coalition, the Decommissioning Plant Coalition, the National Association of Regulatory Utility Commissioners (NARUC), the Council of State Governments, the New England Governor's Conference, the New England Council, the Coalition of Northeastern Governors, and the New England Conference of Public Utility Commissioners.

### 2.5.3 Nuclear Waste Strategy Coalition (NWSC)

The State is a member of the NWSC and participated in their bi-weekly status briefings. The briefings provided updates on

- Administration's strategy for the management of the back end of the nuclear fuel cycle;
- Congressional efforts on budgets, funding, proposed legislations, and hearings for the geologic repository at Yucca Mountain in Nevada;
- Consolidated storage facilities for spent nuclear fuel, including the submission of a license application for the construction and operation of a private consolidated interim storage facility in Texas;
- On-going research activities and reports;
- Resumption of the Yucca Mountain licensing proceedings;
- Publishing a supplemental Environmental Impact Statement for groundwater impacts and discharges at Yucca Mountain;
- Segregating some defense-related nuclear wastes for disposal in a separate, deep borehole repository;
- DOE's consent-based siting (CBS) initiative that included regional public meetings and the drafting of a report on the CBS process;
- NWSC's positions on consolidated interim storage, incentives for hosts, Yucca Mountain and permanent disposal, congressional linkage between storage and disposal facilities, transportation, funding reform, and issue briefs;
- Anticipation over President-Elect Trump's in-coming Administration's perspective on spent nuclear fuel and integrated waste management; and
- Impacts of Committee leadership changes in Congress from the Presidential election,

Some stakeholders, such as the Bipartisan Policy Center, are trying to resolve the stalemate between the House and Senate. Others, like the utilities and the environmental groups, promote their viewpoints and positions to Congress.

The NWSC is an ad hoc organization representing the collective interests of state utility regulators, state attorneys general, state radiation control programs, consumer advocates, electric utilities, local governments, tribes, and associate members on nuclear waste policy matters. NWSC's 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.

## Section 2.6 Summary of Significant National Activity Regarding Spent Nuclear Fuel and High-Level Waste

Five notable events occurred during the year. First, Maine Yankee conducted a successful cask-lid lift and robotic camera inspection demonstration. Second, the NRC published their Supplemental Environmental Impact Statement on the Yucca Mountain's groundwater and made publicly available 3.7 million documents on the Yucca Mountain Project. Next, DOE published a summary of their findings from their public solicitation of developing a national consent-based siting process. Waste Control Specialists submitted to the NRC their license application to construct and operate an interim storage facility for spent nuclear fuel in Texas. Finally, Finland became the first country in the world to start the construction of a permanent geologic repository for the disposal of spent nuclear fuel.

The Appendices capture some of these prominent events and other noteworthy events as noted below.

### 2.6.1 Appendices

Appendix A is a chronological list of condition reports for the year at the Maine Yankee facility.

Appendix B highlights NRC's issuance of their final environmental impact statement supplement on the effects to groundwater from radiological and chemical releases from a planned geologic repository at Yucca Mountain in Nye County, Nevada. The draft report concluded the impacts to the groundwater would be "small."

Appendix C contains Waste Control Specialists' (WCS) filing of their license application to the NRC to construct and operate a consolidated interim storage facility for spent nuclear fuel and high-level radioactive waste in Andrews County, Texas. WCS is expecting to receive a license from NRC in 2019 and begin operations in 2021.

Appendix D illustrates the DOE's National Transportation Stakeholders Forum Newsletter discussing Maine Yankee's cask-lid lift project and the first of a kind robotic camera system for inspecting dry storage canisters.

Appendix E contains the proposed legislation, "Interim Consolidated Storage Act of 2016," that was introduced in the House to amend certain provisions of the Nuclear Waste Policy Act of 1982 to allow the Secretary of Energy to take title of commercial spent fuel and enter into contract with any person that holds a license for the storage of spent nuclear fuel and high-level radioactive waste.

Appendix F displays the House initiative, “Stranded Nuclear Waste Accountability Act of 2016,” that would provide \$100 million to the DOE to provide payments to local communities that have a shutdown nuclear power plant with spent fuel stored on-site. The community would receive a payment of \$15 per kilogram of spent nuclear fuel stored at the site. For Wiscasset, that would translate into a payment of \$8.1 million a year for seven years for the 540 metric tons of spent nuclear fuel stored at Maine Yankee.

Appendix G provides a timeline of the other significant individual activities that transpired in 2016 that finally produced movement in communities in Texas and New Mexico to host interim storage facilities for spent nuclear fuel. The timing meshed well with DOE’s contract award for the fabrication of cask and buffer cars for transporting spent nuclear fuel and their initiative to develop a national consent-based siting process. For a more complete and comprehensive depiction of the highlights the reader is referred to the individual monthly reports that are available at the following website: <http://www.maine.gov/dhhs/mecdc/environmental-health/rad/hp-npow.htm>.

## Appendix A

### Condition Reports

<b>Date</b>	<b>CR #</b>	<b>Description</b>
1/4/2016	16-001	Camera experiencing fogging
1/4/2016	16-002	Small wasp nests inside several outlet vents
1/5/2016	16-003	Momentary loss of site power
1/5/2016	16-004	Key broke off in a lock
1/5/2016	16-005	Loss of internet connectivity with a vendor
1/11/2016	16-006	Water infiltration into generator room after heavy rains
1/11/2016	16-007	Detached ground wire found on one of the concrete cask pads
1/11/2016	16-008	Water infiltration into Maintenance Building after heavy rains
1/11/2016	16-009	Loss of internet connectivity with an outside vendor
1/12/2016	16-010	Loss of telephone/internet service - FairPoint Outage
1/13/2016	16-011	Loss of ID badge during snow removal activities
1/13/2016	16-012	Small hydraulic fluid leak from a plow truck
1/13/2016	16-013	Ice blockage of vent flow path – 25% admin limit reached on several concrete casks
1/14/2016	16-014	Computer device used to activate badges obsolete
1/16/2016	16-015	System degraded due to a transient environmental condition
1/16/2016	16-016	25% Vent flow path Admin Limit reached on several casks due to snow
1/19/2016	16-017	Tracking items from 2015 Training Program review and self-assessment
1/21/2016	16-018	Small rust hole in Gatehouse Door
1/21/2016	16-019	Computer software issues regarding cleared alarm events
1/23/2016	16-020	Tracking for a potential fitness-for-duty concern
1/23/2016	16-021	Central Alarm Station Phone no service for about one minute
1/25/2016	16-022	Potential issue with company records containing personal information at a vendor's facility
1/25/2016	16-023	Lockout/Tagout Coordinator signatures on Attachment A without proper qualifications
1/27/2016	16-024	Vehicle barrier system in one location had shifted
1/29/2016	16-025	Momentary loss of video while technician was shifting some electronics
1/30/2016	16-026	Individual mistakenly brought his personal TLD home
2/3/2016	16-027	Drain hole cover was missing
2/3/2016	16-028	Various cords and wires in Day Room presenting a tripping hazard
2/6/2016	16-029	Camera lens fogging
2/8/2016	16-030	25% Vent flow path Admin Limit reached during snowstorm on one cask
2/11/2016	16-031	VCC inlet screens degraded after snow removal activities
2/11/2016	16-032	Alarms noted on cellphone backup system
2/15/2016	16-033	Heating system for a ventilation unit not working properly
2/22/2016	16-034	Excessive engine noise from a utility vehicle
2/23/2016	16-035	Error message received while attempting to log into computer system
2/25/2016	16-036	Documented discrepancy with cask manufacturer's Technical Specification
2/25/2016	16-037	Telephone equipment cooling fan making abnormal noise
3/1/2016	16-038	Cask inlet screens - steel mesh thickness exceeds manufacturer's specifications
3/3/2016	16-039	Procedure enhancement regarding visitor access
3/3/2016	16-040	Temperature monitoring system's computer clock not on daylight savings time
3/9/2016	16-041	Temperature monitoring system unable to print
3/14/2016	16-042	New video monitor out for a few seconds
3/15/2016	16-043	Labelling of yard light poles did not match engineering drawing
3/15/2016	16-044	Improvement opportunity on use of procedure attachments

3/16/2016	16-045	2016 Training Plan assignment for Training Coordinator incorrect
3/16/2016	16-046	2014 and 2015 10CFR50.59 and 72.48 logs could not be located
3/16/2016	16-047	Camera experiencing clarity issues
3/17/2016	16-048	Open penetration discovered in Operations Building
3/18/2016	16-049	Exterior parking lot light out
3/18/2016	16-050	Video recording system shutdown unexpectedly
3/22/2016	16-051	Employee left their key card at home
3/23/2016	16-052	Tracking training recommendations
3/23/2016	16-053	10 CFR72.212 Evaluation report issued with incorrect information
3/23/2016	16-054	Patrols Not Completed in accordance with procedure guidance
3/24/2016	16-055	Review of training materials not performed prior to training
3/25/2016	16-056	Vent flow path 25% Admin Limit reached on several casks due to ice buildup
3/25/2016	16-057	Strong burning smell detected
3/30/2016	16-058	Alarm panel control box abnormality
4/1/2016	16-059	Safety Issue – steel bar protruding from the ground near construction pad
4/3/2016	16-060	Emergency Plan base radio was not charged up
4/5/2016	16-061	Short duration outage of video monitor
4/7/2016	16-062	Outgoing correspondence issues
4/7/2016	16-063	Firearm removed from service due to a mechanical malfunction
4/7/2016	16-064	Gatehouse Gate opening on its own
4/8/2016	16-065	Standing Water found in Maintenance Building
4/9/2016	16-066	Safety issue - exposed nails found between studs in Maintenance Building
4/11/2016	16-067	One of the parking light poles was not working
4/11/2016	16-068	One exterior power outlet in Maintenance Building not ground fault protected
4/11/2016	16-069	Alarm vendor indicated issues with a restore signal on alarm system
4/13/2016	16-070	Gatehouse Gate found open on its own
4/13/2016	16-071	Outlet vent Resistance Temperature Detectors ID Tags wedged in outlet screens
4/19/2016	16-072	Alarm vendor indicated similar issues with the alarm system
4/19/2016	16-073	Transposition error noted in GTCC waste decay calculation
4/20/2016	16-074	Licensing Basis Design Change Request review sheets filed with E-Plan revs
4/23/2016	16-075	Camera and detector map not properly updated with changes.
4/24/2016	16-076	Security keys inadvertently brought home
4/26/2016	16-077	Potential procedure issue during range qualifications
4/26/2016	16-078	25% Vent flow path Admin Limit reached during snowstorm on one cask
5/3/2016	16-079	Gatehouse gate not closing properly
5/3/2016	16-080	A set of keys were left in locked Armory
5/3/2016	16-081	Fire extinguisher overdue for hydrostatic testing
5/3/2016	16-082	Minor contact made between utility vehicle and personal vehicle.
5/4/2016	16-083	Possible procedure improvement on State Law over the use of force
5/5/2016	16-084	Two personnel TLD results higher than expected
5/6/2016	16-085	Radiation monitor system displayed error message
5/7/2016	16-086	Video monitor momentarily lost its video signal
5/8/2016	16-087	Video monitor momentarily lost its video signal
5/11/2016	16-088	2016 QA Audit findings on training program deficiencies
5/11/2016	16-089	2016 QA Audit findings on administrative controls
5/11/2016	16-090	2016 QA Audit observations on areas for training improvements
5/11/2016	16-091	2016 QA Audit observations on areas for administrative improvements
5/9/2016	16-092	Broken electrical connector on a Maine Yankee utility trailer
5/10/2016	16-093	Armory door alarm switch intermittently failed to clear
5/10/2016	16-094	Video monitor momentarily lost its video signal
5/14/2016	16-095	Evacuation guidance missing from Fire Protection series procedures

5/18/2016	16-096	Wrong revision of cover page used on several procedures
5/19/2016	16-097	State wide car to car channel failed to transmit during a fire drill
5/19/2016	16-098	Video monitor momentarily lost its video signal
5/23/2016	16-099	Unusual mail received via US Mail
5/26/2016	16-100	Procedure title did not match the procedure index
5/30/2016	16-101	Video monitor momentarily lost its video signal
5/31/2016	16-102	Small window on utility vehicle broken due to weed whacking
6/1/2016	16-103	Video monitor momentarily lost its video signal
6/2/2016	16-104	Recommendations from an electrical safety assessment
6/11/2016	16-105	Video monitor momentarily lost its video signal
6/11/2016	16-106	Evaluation of observations from 2016 Fire and Medical Drill
6/13/2016	16-107	Processes and programs effectiveness as a result of the events in Orlando shooting on 6/11/2016
6/14/2016	16-108	North Attic lighting deficiency
6/15/2016	16-109	Old fence post protruding out of ground
6/18/2016	16-110	Deficiency with a non-security video system controller
6/18/2016	16-111	Deficiency with a non-security video system controller
6/20/2016	16-112	Gap in a concrete cask inlet screen
6/20/2016	16-113	On-shift security personnel not carrying contingency weapon when required
6/21/2016	16-114	Weekly testing failure
6/21/2016	16-115	Old fence post protruding out of ground
6/21/2016	16-116	Potential issue with weapons program
6/22/2016	16-117	Recommended improvements for testing of security equipment
6/24/2016	16-118	Results and recommendations from training program self-assessment
6/28/2016	16-119	Only one of six data ports found blocked in security video recorder.
6/30/2016	16-120	Minor gasoline leak to dirt from personal vehicle
7/1/2016	16-121	Maintenance vehicle with a hydraulic leak to pavement
7/3/2016	16-122	Loss of video signal to a camera
7/5/2016	16-123	Security system degradation
7/5/2016	16-124	Minor oil leak from a contractor crane truck
7/6/2016	16-125	Minor oil leak from the same contractor crane truck
7/11/2016	16-126	Potential for loose screws on weapons holster
7/11/2016	16-127	Three unexpected Technetium-99 exempt radioactive sources were identified
7/12/2016	16-128	Building ventilation unit was not working properly
7/14/2016	16-129	Inspection findings from the concrete cask lid lift & camera inspection project
7/14/2016	16-130	Degraded access ramp to construction pad
7/17/2016	16-131	Industrial camera not working properly
7/18/2016	16-132	Area radiation monitor system out of service
7/23/2016	16-133	Operational procedure contained some minor errors
7/25/2016	16-134	Small trees damaged during path clearing
7/25/2016	16-135	Rifle's rear sight out of specification
7/26/2016	16-136	Few drops of an unknown substance on the access road
8/8/2016	16-137	Failure of a single security component
8/10/2016	16-138	Finding of wasp nests in the cask outlet vents
8/17/2016	16-139	ISFSI ground wires severed during excavation for nuisance fence maintenance project
8/18/2016	16-140	Oil leak to pavement.
8/18/2016	16-141	Diesel fuel spill to pavement
8/22/2016	16-142	Vehicle search identifies prohibited items on-site
8/22/2016	16-143	Found five ground water monitoring wells that were not abandoned
8/26/2016	16-144	Small hydraulic fluid leak to pavement
8/26/2016	16-145	Small mixed fuel spill to the soil
9/3/2016	16-146	Small metal scraps left behind from fence repair project

9/6/2016	16-147	Evaluated installing stop lines for vehicle approaches to Gatehouses
9/7/2016	16-148	Security system out-of-service during surveillance testing
9/8/2016	16-149	Found water on interior passenger side floor board of Maine Yankee truck
9/9/2016	16-150	Found unknown substance on pavement
9/15/2016	16-151	Computer for the radiation monitor cycled through an unexpected reboot
9/20/2016	16-152	Coyote seen on-site
9/21/2016	16-153	Found small cracks on Pad 2 stairway handrail
9/26/2016	16-154	Brief loss of backup telephone communication line during planned maintenance
9/28/2016	16-155	OSHA consultant assessment recommendations
10/2/2016	16-156	Temporary malfunction of a security system
10/8/2016	16-157	Small leak of a few drops from a hydraulic line from a rental skid steer
10/12/2016	16-158	Heating, ventilation, and air conditioning not working as designed
10/18/2016	16-159	Found exposed wire on the power cord to diesel generator unit's block heater
10/21/2016	16-160	Fair Point outage of the land line system
10/22/2016	16-161	Momentary loss of lighting
10/23/2016	16-162	After heavy rains water puddle found inside the Storage Maintenance Building
10/29/2016	16-163	Small water leak from heavy rains in the Security Operations Building
11/1/2016	16-164	Icing degradation of an industrial camera
11/1/2016	16-165	Failure of the Security Gator's driver door's hydraulic anchor assembly
11/11/2016	16-166	Momentary loss of communication on the cask temperature monitoring computer
11/16/2017	16-167	Momentary loss of the telephone system
11/28/2016	16-168	Security system degraded
11/29/2016	16-169	Loose door threshold in the Security Operations Building
11/30/2016	16-170	Suggested areas for improvement from the Emergency Plan exercise
12/7/2016	16-171	Uninterrupted Power Supply trouble alarm
12/8/2016	16-172	Safe Guards Information access list was not accurate
12/12/2016	16-173	Minor errors found on numerous closed Condition Reports.
12/15/2016	16-174	Contractor working on-site had not completed the Radiation Worker Training
12/15/2016	16-175	The USB access port on the Safe Guards Information laptop was not blocked
12/16/2016	16-176	Camera affected by environmental conditions
12/18/2016	16-177	Industrial fan with a noisy motor
12/18/2016	16-178	Surface water drainage issue in the northwest corner of the ISFSI
12/19/2016	16-179	Broken drain pipe access cover protruding from the ground
12/20/2016	16-180	Battery back-up emergency and exit lights failed test
12/21/2016	16-181	Evaluate if packages require search prior to being brought into Day Room
12/30/2016	16-182	Security system degraded caused by environmental conditions

## Appendix B – NRC Issues Final Groundwater Supplement to Yucca Mountain



No: 16-024

May 5, 2016

Contact: David McIntyre, 301-415-8200

### **NRC Issues Final Supplement to Yucca Mountain Environmental Impact Statement**

The Nuclear Regulatory Commission has published the staff's final environmental impact statement supplement on a proposed permanent repository for spent nuclear fuel and high-level radioactive waste at Yucca Mountain in Nevada. The supplement analyzes potential impacts on groundwater and surface groundwater discharges and determines all impacts would be "small."

The document supplements environmental impact statements the Department of Energy prepared on the proposed repository. DOE issued the final EIS in 2002, then supplemented it in June 2008 when it submitted a construction authorization application to the NRC. Under the Nuclear Waste Policy Act, the NRC is to adopt DOE's EIS to the extent practicable. The NRC staff recommended adoption of DOE's EISs in September 2008, but noted the need to supplement the study of groundwater effects in the Yucca Mountain aquifer beyond DOE's analyzed location at the site boundary. DOE ultimately deferred to the NRC to prepare the supplement.

The NRC published a draft of the supplement for public comment last August. During the 91-day comment period, NRC staff conducted public meetings to present the report and receive comments in Rockville, Md., and in Las Vegas and Amargosa Valley, Nev. Including comment letters and oral comments, the NRC received more than 1,200 comments on the draft supplement. The NRC staff's responses to these comments, and descriptions of changes made to the final report in response to comments, are in Appendix B of the supplement.

The supplement to the [Yucca Mountain EIS](#) is available on the NRC website.

## Appendix C –Waste Control Specialists License Application Filing



AMERICA'S NUCLEAR SOLUTION

**FOR IMMEDIATE RELEASE**

CONTACT: Chuck McDonald  
512-658-5958

### **WCS Files License Application with Nuclear Regulatory Commission (NRC) to Operate a Consolidated Interim Storage Facility (CISF) for Used Nuclear Fuel**

WASHINGTON, D.C. (April 28, 2016) - Waste Control Specialists LLC (WCS) submitted an application to the Nuclear Regulatory Commission (NRC) for a license to construct and operate a Consolidated Interim Storage Facility (CISF) for used nuclear fuel. The filing comes after a year of pre-application meetings with NRC and maintains the timeline WCS outlined in February 2015.

The application is being led by WCS, along with its partners AREVA and NAC International, both global industry leaders in the transportation and storage of used nuclear fuel.

"It's been a busy but productive year since we made our announcement in Washington in 2015 so I am very pleased that we are on time and on target, said WCS president & CEO Rod Baltzer.

"Thanks to the hard work of our partners at AREVA and NAC International, and input from NRC, we were able to deliver a very thorough, detailed license application this morning. As a result, I am confident that we will have a final license in approximately three years. This is a critical first step and I hope that legislative and DOE contractual matters can also be resolved in that period."

Baltzer said the license submittal puts WCS on track for completion of a CISF as early as 2021, if such steps are accomplished within our expected timeline.

Timely solutions for the used nuclear fuel challenge in the U.S. have proved elusive for more than 40 years. Now a private sector solution for secure storage has been proposed by a company with a proven track record for licensing success.

WCS is the only privately-owned and operated facility in the United States that has been licensed to treat, store and dispose of Class A, B and C low-level radioactive waste (LLRW). Located in an arid, isolated part of west Texas, WCS offers one of the most geologically characterized locations in the United States as a result of the multi-year licensing process for that facility.

(more)

[www.WCSstorage.com](http://www.WCSstorage.com)

"We believe we can provide a safe interim solution for this used nuclear fuel, which has been accumulating at nuclear power plants across the country and for which our nation has been struggling to develop a comprehensive waste management system," said Baltzer.

"What we are proposing is an initial 40 year storage license for 40,000 metric tons of heavy metal (MTHM) to be built in eight phases. Each of the eight storage systems will be able to accommodate 5,000 MTHM for an eventual capacity of 40,000 MTHM. Our proposal includes opportunities for 20 year renewals after the initial license period," added Baltzer.

The primary operations performed at the site will be transferring the sealed canisters of used fuel from a transportation cask into an engineered interim fuel storage system where it will be monitored until its departure to an offsite permanent disposal location.

"Consolidated interim storage would provide system-wide benefits and flexibilities to strengthen the U.S. Used Nuclear Fuel Management Program and help advance a permanent geologic disposal program.

It creates a robust opportunity to develop and deploy the repackaging technology to prepare the used nuclear fuel currently in dry storage for final offsite disposal in a geologic repository," said Baltzer

Other benefits of consolidated interim storage include the opportunity to reduce the risk of further degradation of on-site infrastructure at permanently shut down reactor sites and to address public concerns about transportation by demonstrating successful transport of this material.

Another chief benefit of an accelerated schedule for moving fuel away from shutdown sites is to reduce the liability to taxpayers. The taxpayer supported Judgment Fund is the source of payment of judgements against the federal government for failing to meet its contractual obligations to dispose of this material.

###

WCS is a subsidiary of Valhi, Inc. (NYSE: VHI). Valhi, Inc. is engaged in the titanium dioxide pigments, component products (security products and high performance marine components), waste management, and real estate management and development industries.

*Statements in this release that are not historical in nature are forward-looking in nature that represent the Company's beliefs and assumptions based on currently available information. In some cases, these forward-looking statements can be identified by the use of words such as "believes," "intends," "may," "should," "could," "anticipates," "expected" or comparable terminology. Although the Company believes the expectations reflected in such forward-looking statements are reasonable, the Company does not know if these expectations will be correct. Forward-looking statements by their nature involve substantial risks and uncertainties that could significantly impact expected results. Actual future results could differ materially from those predicted. Among the factors that could cause the Company's actual future results to differ materially from those described herein are the risks and uncertainties described from time to time in the Company's filings with the Securities and Exchange Commission.*

**[www.WCSstorage.com](http://www.WCSstorage.com)**



**AMERICA'S NUCLEAR SOLUTION**

April 28, 2016

Mr. Mark Lombard, Director  
U.S. Nuclear Regulatory Commission  
Division of Spent Fuel Management  
Attention: Document Control Desk  
One White Flint North  
11555 Rockville Pike  
Rockville, MD 20852-2738

**Subject: License Application to Construct and Operate a Consolidated Interim Storage Facility for Spent Nuclear Fuel in Andrews County, Texas, Docket 72-1050**

Dear Mr. Lombard:

Waste Control Specialists LLC (WCS) hereby files its specific license application requesting authorization to construct and operate a Consolidated Interim Storage Facility (CISF) for Spent Nuclear Fuel and Reactor-Related Greater Than Class C Low-Level Waste (referred to henceforth as SNF) in Andrews County, Texas.

WCS requests authorization to possess 5,000 Metric Tons of Uranium (MTU) for dry-cask storage of SNF for a duration of 40 years. The license application focuses primarily on receiving SNF from the existing permanently shutdown and/or decommissioned commercial reactors across the U.S. WCS believes that this approach will allow for the safe consolidated interim storage of SNF in a community that has expressed its willingness to host such a facility consistent with the recommendations from President Barack Obama's Blue Ribbon Commission on America's Nuclear Future, until such time that a permanent geologic repository is licensed, constructed, and able to serve the nation's need as envisioned under the Nuclear Waste Policy Act of 1982.

The purpose and objective of licensing the CISF in Andrews County, Texas, is to allow the removal of SNF and the return of decommissioned reactor sites to a green field status. These lands may be subsequently repurposed in ways that economically benefit the communities that had been willing to host commercial nuclear reactors needed to generate electricity. A conservative and comprehensive cost-benefit analysis concluded that this is an economically efficient solution that could reduce the expenditure of the Federal Government by hundreds of millions of dollars compared to the "no action" alternative. Additionally, by allowing the federal government to meet its obligations to take spent nuclear fuel, this approach could also allow the burden to shift to the ratepayers, who have already paid into the Nuclear Waste Fund, and save taxpayers over 5.4 billion dollars. Finally, there could be a benefit of over 1 billion dollars to the local communities that are currently hosting or that will in the future host de facto "interim storage facilities" at

*Corporate*  
5430 LBJ Freeway, Ste. 1700  
Three Lincoln Centre  
Dallas, TX 75240  
Ph. 972.715.9800  
Fx. 972.448.1419

*Facility*  
P.O. Box 1129  
Andrews, TX 79714  
Ph. 888.789.2783  
Fx. 432-525-8902

NM5526

Enclosures transmitted herein contain SUNSI. When separated from enclosures, this transmittal document is decontrolled.

Mr. Mark Lombard, Director  
U.S. Nuclear Regulatory Commission  
April 28, 2016

decommissioning reactor sites, in that they would be able to more constructively repurpose land being used for no other function than to store "stranded" fuel.

As specified in the license application, WCS anticipates that the U.S. Department of Energy (DOE) would take title to the SNF and transport it from existing storage sites across the U.S. to the CISF.

WCS has prepared the license application consistent with the requirements specified in Title 10 of the Code of Federal Regulations (CFR), Part 72, *Licensing Requirements for the Independent Storage of Spent Nuclear Fuel, High-Level Radioactive Waste, and Reactor-Related Greater Than Class C Waste*. WCS also relied on information provided in Regulatory Guide (RG) 3.50, *Standard Format and Content for a Specific License Application for an Independent Spent Fuel Storage Installation or Monitored Retrievable Storage Facility*, to prepare the license.

The specific license application contains the following:

- A Safety Analysis Report (SAR) which contains the information specified in 10 CFR 72.24, Contents of application: Technical information. It was prepared following the information provided in RG-3.48, *Standard Format and Content for the Safety Analysis Report for an Independent Spent Fuel Storage Installation or Monitored Retrievable Storage Installation (Dry Storage)*. Information provided in NUREG-1567, *Standard Review Plan for Spent Fuel Dry Storage Facilities*, was also used to prepare the SAR.
- A Quality Assurance Program Description is provided in Chapter 6 and Appendix C to the license application pursuant to 10 CFR 72.24(n) and 72.140(d).
- The Physical Security Plan, including the guard training, and a Safeguard Contingency Plan, are provided pursuant to 10 CFR 72.24(o), 72.180, and 72.184, respectively, separately as part of this license application because it contains Safeguards Information.
- Proposed Technical Specifications are provided in Appendix A of the license application pursuant to the requirements specified in 10 CFR 72.26.
- A description of WCS' technical qualifications is provided in Chapters 2 of the license application pursuant to 10 CFR 72.28.
- WCS' proposed training program is similarly described in Chapter 7 of the license application as required under 10 CFR 72.28(b) and §72, Subpart I.
- A proposed decommissioning plan and decommissioning funding plan is provided in Chapter 10, as well as Appendices B and D of license application. A decommissioning cost estimate supporting the license application was prepared following NUREG-1757, *Consolidated Decommissioning Guidance*.

Mr. Mark Lombard, Director  
U.S. Nuclear Regulatory Commission  
April 28, 2016

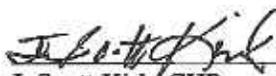
- WCS' Emergency Response Plan (ERP) is included as part of this application pursuant to 10 CFR 72.32. This plan was prepared to include the location and hazards associated with storing SNF at the CISF following RG 3.67, *Standard Format and Content for Emergency Plans for Fuel Cycle and Materials Facilities*, and other guidance specified in the ERP.
- An Environmental Report was prepared to assess the radiological and non-radiological impacts associated with storing up to 40,000 MTU of SNF for a period of 40 years following NUREG-1748, *Environmental Review Guidance for Licensing Actions Associated with NMSS Programs*. WCS ensured that the cumulative environmental impacts associated with storing SNF at the CISF were evaluated in a manner that avoids segmentation of the requirements specified in the National Environmental Policy Act of 1969. WCS also incorporated by reference Environment Impact Statements previously conducted by the NRC related to the transportation and storage of SNF, as well as at the National Enrichment Facility located on property adjacent to the CISF.
- Proposed license conditions are provided in Chapter 13 of the license application pursuant to 10 CFR 72.44.

WCS hereby files its license application with the NRC. Both proprietary and non-proprietary versions of the license application and supporting documents are provided herein accompanied by the enclosed affidavits pursuant to 10 CFR 2.390.

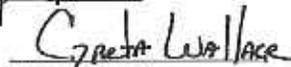
WCS requests that a copy of all correspondence regarding this matter be directly emailed to my attention (skirk@valhi.net) as soon as possible after issuance. If you have any questions or need additional information, please call me at 972-450-4284.

I certify under penalty of perjury that the foregoing is true and correct.

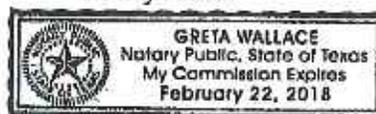
Executed on April 25, 2016.

  
\_\_\_\_\_  
J. Scott Kirk, CHP  
Vice President of Licensing and Regulatory Affairs

I certify the above named person appeared before me and executed this document on this the 25<sup>th</sup> day of April, 2016.

  
\_\_\_\_\_  
Notary Public

February 22, 2018  
My commission expires



# Appendix D – DOE Article on Maine Yankee’s Cask Lift & Robotic Inspection



## National Transportation Stakeholders Forum Newsletter December 2016

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## **2016 Maine Yankee Cask Lid Lift Project**

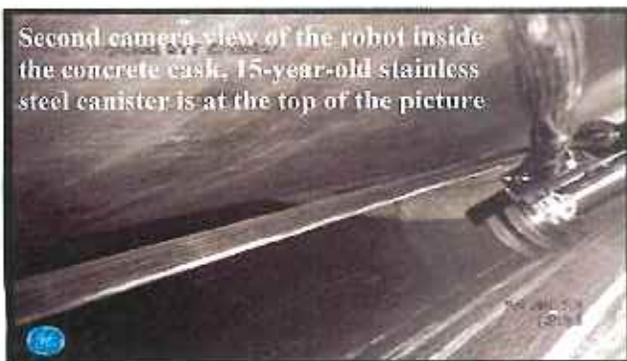
*by Pat Dostie (pat.dostie@maine.gov), State Nuclear Safety Inspector, State of Maine, Department of Health & Human Services, Office of Licensing & Regulatory Services, Division of Environmental & Community Health, Radiation Control / State Nuclear Regulation*

As a condition for renewal of dry cask storage system specific and general licenses, the Nuclear Regulatory Commission (NRC) is evaluating extended storage of spent nuclear fuel and has identified chloride induced stress corrosion cracking in marine environments as a degradation mechanism that warrants further research. Research conducted by the industry will inform the License Renewal Applications (LRAs) that Specific Licenses and Certificate of Compliance (CoC) holders must submit in order to renew these licenses.

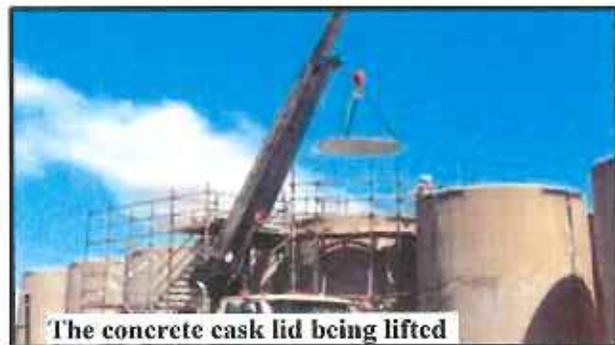


**The magnetized rover/robot**

In addition, a demonstration of a first of its kind robotic camera system for inspecting dry storage canisters was conducted by a team from the Electric Power Research Institute (EPRI), Robotic Technologies of Tennessee and General Electric. The Maine Yankee field demonstration drew considerable interest since it was the first time this demonstration was being conducted on an in-service canister. There were representatives from NAC International, the canister manufacturer, NRC Headquarters' staff, the State of Maine, nuclear utility representatives from Duke Energy and San Onofre Nuclear Generating Station, Structural Integrity Associates and Sandia National Laboratories.



**Second camera view of the robot inside the concrete cask. 15-year-old stainless steel canister is at the top of the picture**



**The concrete cask lid being lifted**

As part of its aging management program and in preparation for the LRA to be submitted by NAC (Maine Yankee's cask system supplier) to the NRC, Maine Yankee performed a cask lid lift in July to inspect this bolted joint which functions to keep weather and unwanted moisture from inside the cask system. On July 11, Maine Yankee removed a cask lid, as illustrated in the first photo, on one of the vertical concrete casks that housed the cut up internals of the reactor pressure vessel (referred to as Greater than Class C waste) to inspect the bolted joint.

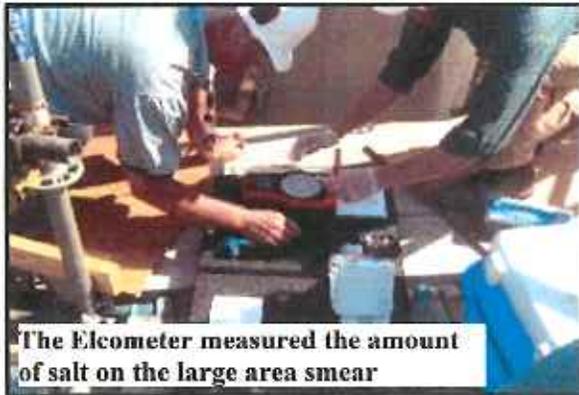


**The magnetized rover/robot inside the top, south vent**

The Maine Yankee demonstration used two cameras mounted on a small, four-wheeled robot as an inspection tool for future canister inspections. The second photo shows the miniaturized robot without the camera hook-up. The robot had magnetic wheels so it could adhere to the painted carbon steel liner of the cask itself. Prior to inserting the robotic camera assembly through an outlet vent as shown in the third photo, radiation surveys were performed inside the vents at arm's length with the highest recorded reading at 3.5 mR/hr. In three of the top vents, the camera was inserted the full length (approximately 14 feet) of the canister. The camera video footage was recorded and pictures could be taken at

any time. Internal radiation surveys were also performed with the robot the full length of the canister from the same three top vents. The highest recorded reading was 89.54 R/hr in the north vent about four feet from the bottom. The robotic demonstration continued the next day with additional camera footage taken at two of the four inlet vents on the bottom of the cask. Hand surveys of the insides of the bottom vents measured as high as 110 mR/hr.

Surface salt testing was also performed by Maine Yankee and their consultant, Ransom Environmental of Portland, Maine. Field testing for surface salts used an Elcometer salt contamination meter and is shown on the fourth and fifth photos. Salt levels of 0.5 and 0.7  $\mu\text{g}/\text{cm}^2$  were reported on the shield plug underneath the cover. Salt levels of 0.0 - 0.2  $\mu\text{g}/\text{cm}^2$  were reported for the top



The Elcometer measured the amount of salt on the large area smear



A large area smear is placed on top of the shield plug

outlet vents. Salt testing was also performed inside the inlet vents and was also

performed on two spent fuel vertical concrete casks. The highest spent fuel cask reading with the Elcometer was 1.1  $\mu\text{g}/\text{cm}^2$ . All salt levels appear to be very low. Additional samples were taken and sent for offsite laboratory analysis.

In the coming months, EPRI and Maine Yankee will be evaluating and reporting on the information collected by this effort which will add knowledge to government and industry alike on extending the licensed operating period of dry storage systems for spent nuclear fuel.

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### **WIPP Exercise and Outreach in the South**

*by Christopher U. Wells, ([wells@sseb.org](mailto:wells@sseb.org)), Assistant Director, Nuclear Programs, Southern States Energy Board*

Although the Waste Isolation Pilot Plant (WIPP) site in Carlsbad, New Mexico, has not received a shipment since the beginning of 2014, all signs point to a restart within the December 2016 - June 2017 timeframe. In the meanwhile, the Department has emphasized a culture of safety by continuing bolting operations, installing a new ventilation system, repairing and upgrading fire suppressions systems and adopting a revised Waste Acceptance Criteria. Another major improvement included the completed construction of a new Emergency Operations Center.

As we draw nearer to the reopening of the site and subsequent re-initiation of the WIPP campaign, SSEB's TRU corridor states have remained in a stance of preparedness. Officials in Texas are presently planning a WIPPTREX in the city of Big Spring, which is located along the I-20 corridor in the central western part of the state, to simulate an accident involving a TRU shipment and test the capabilities of their responders. Local agencies participating in the exercise began holding planning meetings in April 2016 and were very receptive and eager to support the drill. These agencies have started developing objectives and a draft scenario outlining goals to be achieved during the exercise. In addition, they have requested training from the DOE-Carlsbad Field Office (DOE-CBFO) for their hospitals and public information officers. The current schedule included a previous Tabletop WIPPTREX held on October 5, 2016, and the Full-Scale WIPPTREX to be held on November 9, 2016.

Finally, as a precursor to the resumption of shipments, SSEB is currently coordinating with its member states and DOE-CBFO to conduct a southern corridor roadshow in the first quarter of 2017. This event would involve the WIPP truck and transportation packages traversing the region and stopping in each corridor state to offer presentations/displays,

# Appendix E – House Bill “Interim Consolidated Storage Act of 2016”



1

114<sup>TH</sup> CONGRESS  
2<sup>D</sup> SESSION

## H. R. 4745

To amend the Nuclear Waste Policy Act of 1982 to authorize the Secretary of Energy to enter into contracts for the storage of certain high-level radioactive waste and spent nuclear fuel and take title to certain high-level radioactive waste and spent nuclear fuel.

---

### IN THE HOUSE OF REPRESENTATIVES

MARCH 15, 2016

Mr. MULVANEY introduced the following bill; which was referred to the Committee on Energy and Commerce

---

## A BILL

To amend the Nuclear Waste Policy Act of 1982 to authorize the Secretary of Energy to enter into contracts for the storage of certain high-level radioactive waste and spent nuclear fuel and take title to certain high-level radioactive waste and spent nuclear fuel.

1 *Be it enacted by the Senate and House of Representa-*  
2 *tives of the United States of America in Congress assembled,*

3 **SECTION 1. SHORT TITLE.**

4 This Act may be cited as the “Interim Consolidated  
5 Storage Act of 2016”.

1 **SEC. 2. DEFINITION OF INTERIM CONSOLIDATED STORAGE**  
2 **FACILITY.**

3 Section 2 of the Nuclear Waste Policy Act of 1982  
4 (42 U.S.C. 10101) is amended by adding at the end the  
5 following new paragraph:

6 “(35) The term ‘interim consolidated storage  
7 facility’ means a facility that possesses a specific li-  
8 cense issued by the Commission that authorizes stor-  
9 age of high-level radioactive waste or spent nuclear  
10 fuel received from the Secretary or from two or more  
11 persons that generate or hold title to high-level ra-  
12 dioactive waste or spent nuclear fuel generated at a  
13 civilian nuclear power reactor.”.

14 **SEC. 3. INTERIM CONSOLIDATED STORAGE OF HIGH-LEVEL**  
15 **RADIOACTIVE WASTE AND SPENT NUCLEAR**  
16 **FUEL.**

17 (a) **STORAGE OF SPENT NUCLEAR FUEL.**—Section  
18 135(h) of the Nuclear Waste Policy Act of 1982 (42  
19 U.S.C. 10155(h)) is amended by striking “Notwith-  
20 standing any other provision of law” and inserting “Ex-  
21 cept as provided in section 302, and subtitle I of title I”.

22 (b) **INTERIM CONSOLIDATED STORAGE.**—Title I of  
23 the Nuclear Waste Policy Act of 1982 (42 U.S.C. 10121  
24 et seq.) is amended by adding at the end the following:

1   **“Subtitle I—Interim Consolidated**  
2                                   **Storage**

3   **“SEC. 190. INTERIM CONSOLIDATED STORAGE.**

4       “(a) IN GENERAL.—The Secretary may enter into  
5 contracts for the storage of high-level radioactive waste  
6 or spent nuclear fuel with any person that holds a license  
7 for an interim consolidated storage facility.

8       “(b) DEFINITION OF HIGH-LEVEL RADIOACTIVE  
9 WASTE.—For purposes of this subtitle and section 302,  
10 the term ‘high-level radioactive waste’ includes Greater  
11 than Class C waste as defined in section 72.3 of title 10,  
12 Code of Federal Regulations. Nothing in this section or  
13 section 191 shall be interpreted to affect existing judicial  
14 interpretation of the term high-level radioactive waste or  
15 to require the disposal of Greater than Class C waste in  
16 a repository.

17   **“SEC. 191. CONTRACTS.**

18       “(a) IN GENERAL.—The Secretary may enter into  
19 new contracts or modify existing contracts with any person  
20 who generates or holds title to high-level radioactive waste  
21 or spent nuclear fuel of domestic origin for the acceptance  
22 of title and subsequent storage of such waste or fuel at  
23 an interim consolidated storage facility, with priority for  
24 storage given to high-level radioactive waste and spent nu-

1 clear fuel located on sites without an operating nuclear  
2 reactor.

3       “(b) CONTRACT TERMS.—A contract entered into or  
4 modified under this section shall provide that acceptance  
5 by the Secretary, and transfer of title under subsection  
6 (d), of any high-level radioactive waste or spent nuclear  
7 fuel for an interim consolidated storage facility satisfies  
8 the Secretary’s responsibility under a contract entered  
9 into under section 302(a) to accept title to such waste or  
10 fuel for disposal, with respect to such accepted waste or  
11 fuel.

12       “(c) LIMITATION.—The Secretary shall not require a  
13 person to settle claims against the United States for the  
14 breach of a contract entered into under section 302(a) for  
15 the disposal of high-level radioactive waste or spent nu-  
16 clear fuel as a condition precedent of entering into or  
17 modifying a contract under this section.

18       “(d) TITLE TO MATERIAL.—Delivery, and acceptance  
19 by the Secretary, of any high-level radioactive waste or  
20 spent nuclear fuel for an interim consolidated storage fa-  
21 cility shall constitute a transfer to the Secretary of title  
22 to such waste or fuel.”.

23       “(c) NUCLEAR WASTE FUND.—Section 302(d) of the  
24 Nuclear Waste Policy Act of 1982 (42 U.S.C. 10222(d))  
25 is amended—

1 (1) in paragraph (4), by striking “in a mon-  
2 itored, retrievable storage site” and inserting “in an  
3 interim consolidated storage facility or monitored re-  
4 trievable storage site,”;

5 (2) in paragraph (5)—

6 (A) by striking “a monitored, retrievable  
7 storage site” and inserting “an interim consoli-  
8 dated storage facility site, a monitored retriev-  
9 able storage site,”;

10 (B) by striking “such repository, mon-  
11 itored, retrievable storage facility” and insert-  
12 ing “such repository, interim consolidated stor-  
13 age facility, monitored retrievable storage facil-  
14 ity,”; and

15 (C) by striking “; and” and inserting a  
16 semicolon;

17 (3) by redesignating paragraph (6) as para-  
18 graph (7);

19 (4) by inserting after paragraph (5) the fol-  
20 lowing:

21 “(6) the fees and costs in connection with the  
22 storage of high-level radioactive waste or spent nu-  
23 clear fuel in an interim consolidated storage facility;  
24 and”; and

1           (5) by inserting "For purposes of the preceding  
2 sentence, fees and costs described in paragraph (6)  
3 shall not be considered amounts for the construction  
4 or expansion of any facility." after "this or subse-  
5 quent legislation."

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# Appendix F – House Bill “Stranded Nuclear Waste Accountability Act of 2016”



1

114TH CONGRESS  
2D SESSION

## H. R. 5632

To direct the Secretary of Energy to carry out a program to provide payments to communities in which a nuclear power plant that has ceased generating electricity and that stores spent nuclear fuel onsite is located, and for other purposes.

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### IN THE HOUSE OF REPRESENTATIVES

JULY 6, 2016

Mr. DOLD (for himself, Mr. COURTNEY, Mr. WELCH, and Mr. RIBBLE) introduced the following bill; which was referred to the Committee on Energy and Commerce

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## A BILL

To direct the Secretary of Energy to carry out a program to provide payments to communities in which a nuclear power plant that has ceased generating electricity and that stores spent nuclear fuel onsite is located, and for other purposes.

1 *Be it enacted by the Senate and House of Representa-*  
2 *tives of the United States of America in Congress assembled,*

3 **SECTION 1. SHORT TITLE.**

4 This Act may be cited as the “Stranded Nuclear  
5 Waste Accountability Act of 2016”.

1 **SEC. 2. PROGRAM FOR PAYMENTS TO COMMUNITIES THAT**  
2 **ARE IMPACTED BY INTERIM STORAGE OF**  
3 **SPENT NUCLEAR FUEL.**

4 (a) **PROGRAM.**—The Secretary of Energy shall estab-  
5 lish and carry out a program to make payments to units  
6 of general local government within the jurisdictional  
7 boundaries of which an eligible civilian nuclear power  
8 plant is located.

9 (b) **PAYMENTS.**—

10 (1) **AMOUNT.**—Except as provided in paragraph  
11 (3), a payment made to a unit of general local gov-  
12 ernment under the program established under sub-  
13 section (a) shall be equal to \$15 per kilogram of  
14 spent nuclear fuel stored at the eligible civilian nu-  
15 clear power plant that is located within the jurisdic-  
16 tional boundaries of such unit of general local gov-  
17 ernment.

18 (2) **NUMBER AND FREQUENCY.**—For each eligi-  
19 ble civilian nuclear power plant, the Secretary may  
20 only make one payment to one unit of general local  
21 government per fiscal year under the program estab-  
22 lished under subsection (a).

23 (3) **PRO RATA REDUCTION.**—For any fiscal  
24 year, the Secretary shall, on a pro rata basis, reduce  
25 the amount paid to a unit of general local govern-  
26 ment under the program established under sub-

1 section (a) as necessary to ensure, to the extent pos-  
2 sible, that a payment is made to a unit of general  
3 local government with respect to each eligible civilian  
4 nuclear power plant for that fiscal year.

5 (4) ANNUAL APPLICATION.—In order to be eli-  
6 gible to receive a payment under the program estab-  
7 lished under subsection (a) for a fiscal year, a unit  
8 of general local government shall submit an applica-  
9 tion to the Secretary.

10 (c) DEFINITIONS.—In this Act:

11 (1) CIVILIAN NUCLEAR POWER REACTOR.—The  
12 term “civilian nuclear power reactor” has the mean-  
13 ing given such term in section 2(6) of the Nuclear  
14 Waste Policy Act of 1982 (42 U.S.C. 10101(6)).

15 (2) ELIGIBLE CIVILIAN NUCLEAR POWER  
16 PLANT.—The term “eligible civilian nuclear power  
17 plant” means a site at which—

18 (A) each civilian nuclear power reactor lo-  
19 cated at such site has ceased generating elec-  
20 tricity prior to the date of enactment of this  
21 Act; and

22 (B) spent nuclear fuel is being stored.

23 (3) SECRETARY.—The term “Secretary” means  
24 the Secretary of Energy.

1           (4) SPENT NUCLEAR FUEL.—The term “spent  
2 nuclear fuel” has the meaning given such term in  
3 section 2(23) of the Nuclear Waste Policy Act of  
4 1982 (42 U.S.C. 10101(23)).

5           (5) UNIT OF GENERAL LOCAL GOVERNMENT.—  
6 The term “unit of general local government” has the  
7 meaning given such term in section 2(28) of the Nu-  
8 clear Waste Policy Act of 1982 (42 U.S.C.  
9 10101(28)).

10          (d) AUTHORIZATION OF APPROPRIATIONS.—There  
11 are authorized to be appropriated \$100,000,000 for the  
12 program established under subsection (a) for each of fiscal  
13 years 2017 through 2023.

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## Appendix G – Newsworthy Items

- On January 5, the Department of Energy (DOE) selected Battelle Memorial Institute to lead a team to drill a test borehole of over 16,000 feet into a crystalline rock formation near Rugby, North Dakota as part of an initiative to explore the disposal of defense-related high-level radioactive waste. The five-year project will examine the chemical and mechanical properties of the host rock besides drilling and sealing challenges. The first phase of the project will be with a test hole of 8.5 inches in diameter. If that is successful, a 17.5 inch test hole will then be drilled to perform handling and retrieval operations besides testing on storage containers.
- On January 20, DOE held an invitational meeting in Washington, D.C. to kick-off its consent-based siting process. The process will be a three phase effort with public and stakeholder engagement, design of a formal process, and engaging host communities using the process. DOE was committed to a durable process that will be flexible, inclusive, adaptive, and transparent. DOE was expected to draw on the consent-based siting models used in Canada, Finland, and Sweden.
- On January 21, DOE announced that it will resume its operations at the Waste Isolation Pilot Project (WIPP) in Carlsbad, New Mexico in December 2016. The facility which had been receiving defense-related plutonium waste from the weapons era for 15 years was closed after an unplanned release of airborne radioactivity from a faulty drum occurred on February 14, 2014. Since then, new ventilation with a higher capacity flow was installed, the radioactive contamination was fixed on salt surfaces using water sprays, and a new emergency operations center was constructed to deal with state and local communities.
- On January 22, the New Mexico Environment Department, DOE and its contractors finalized a \$74 million settlement agreement from fines issued by New Mexico on DOE for two incidents at the Waste Isolation Pilot Project (WIPP) facility in Carlsbad, New Mexico. The final settlement allocated funds for road improvements, water infrastructure, and emergency response capabilities.
- On February 12, the Nuclear Waste Strategy Coalition, the National Association of Regulatory Utility Commissioners, and the Nuclear Energy Institute co-signed a letter to the Secretary of Energy expressing their concern for transparency in DOE's reporting of the Nuclear Waste Fund's status. The letter highlighted the billions of dollars that ratepayers have borne through mandated fees and taxpayers have paid for damages due to the federal government's failure to meet its contractual responsibilities. The three organizations advocated for "an annual plain-English accounting of how the money was collected and spent and how much remained".
- On February 18, DOE announced the eight locations where it will be hosting public meetings seeking public input in formulating a national consent-based siting process for communities wishing to host an interim spent fuel storage or geologic disposal facility. The first meeting is scheduled for March 29 in Chicago followed by Atlanta on April 11. The remaining six meetings were expected to be completed by the end of July and will be held in Boise, Idaho; Boston, Massachusetts; Denver, Colorado; Minneapolis, Minnesota; Sacramento, California; and Tempe, Arizona.
- On February 18, the University of Eastern Finland announced that they had developed a new spring model that can predict with good accuracy the swelling in bentonite clay at atomic-level interactions in a clay-water system. Bentonite clay is a key barrier in the deep geologic disposal of high-level nuclear waste as its main purpose is to protect waste canisters from contacting underground water and other corrosive agents such as bacteria. The plasticity of the bentonite clay helps the waste canister to stay intact against rock movements or earthquakes, making the clay's swelling behavior vital as a buffer for disposal safety.
- On February 24, DOE informed the public that it had published its final environmental impact statement (EIS) for the disposal of Greater Than Class C (GTCC) Low-Level Radioactive Waste and GTCC-Like Waste. The report identified the different types of GTCC, both in volume and radioactivity, evaluated

six federal locations, and described five disposal alternatives. DOE's preferred approach was disposal in the WIPP facility near Carlsbad, New Mexico. Maine Yankee has four concrete casks at the Wiscasset facility that contain GTCC waste.

- On February 29, the Chair of the House Committee on Energy and Commerce and the Chair of the Subcommittee on Environment and Economy forwarded a letter to the Comptroller General of the Government Accountability Office (GAO) exhorting urgency for reconstituting the nation's nuclear waste disposal program. The Chairs asked the nonpartisan watchdog to evaluate DOE's ability to complete the Yucca Mountain licensing application.
- On March 1, the Pierce County Commission in Rugby, North Dakota, voted unanimously to tell the Energy and Environmental Research Center at the University of North Dakota that they wanted no part of the University's borehole project to help DOE determine if granite rock three miles deep was suitable for storing defense-related, high-level radioactive waste.
- On March 15, nine congressional representatives from California, Connecticut, Maine (Rep. Chellie Pingree), Texas, and Vermont sent a letter to the Chair and Ranking Member of the Subcommittee on Energy and Water Development of the House Committee on Appropriations requesting their assistance in the judicious removal of spent nuclear fuel and GTCC from their respective communities in their states where nuclear reactors have permanently ceased operations. They appealed for the Chair's and Ranking Member's support for DOE's proposed fiscal year 2017 budget requesting funds to construct a pilot interim storage facility to receive spent nuclear fuel from shutdown reactor sites, like Maine Yankee.
- On March 15, South Carolina Representative Mulvaney submitted H.R.4745, the "Interim Consolidated Storage Act of 2016," which proposed authorizing the Energy Secretary to enter into any contracts for the storage of spent nuclear fuel and to take title of the nuclear wastes. Representative Conaway proposal had 29 cosponsors, including Maine's two representatives, Rep. Chellie Pingree and Rep. Bruce Poliquin.
- On March 17, House Chair of the Energy and Commerce Committee and its Chair of the Subcommittee on Environment and the Economy forwarded a letter to Energy Secretary Moniz expressing concern over the federal government's necessity to fulfill its statutory responsibility under the Nuclear Waste Policy Act and emphasizing the completion of the Yucca Mountain License Application as a means of furthering the federal government's goal to meet its obligations under the Act.
- On March 22, The Heritage Foundation published an article, entitled "Real Consent for Nuclear Waste Management Starts with a Free Market." The authors asserted that the current nuclear waste management system was broken and that establishing a consent-based process for interim and long-term storage would not support long-term storage and disposal. They cited the successful efforts of Finland and Sweden where nuclear facilities were held responsible for managing their nuclear wastes. Initially, communities were reluctant and opposed hosting nuclear wastes in their backyards. Eventually, host communities consented based on improved community engagement, compensation packages, and tax arrangements. They concluded that Congress should institute reform by holding nuclear waste producers responsible for their own waste management.
- On March 29, DOE held its first of eight consent-based siting public meetings in Chicago that featured presentations from a special panel of invitees, public questions and discussions with the panelists, facilitated small group discussions and summaries of highlights from the group discussions.
- In March, the first issue of the Nuclear Waste Management Organization (NWMO) of Canada published a newsletter that highlighted three major, ongoing research projects. The first involved the testing of Canada's used fuel container under geologic pressures at the Applied Research Laboratory's High-Pressure Test Facility at Pennsylvania State University. The second focused on the long-term stability of a repository and its ability to withstand future earthquakes by understanding ancient earthquakes and mapping the landslide deposits on lake bottoms. The last project was an ongoing study of the University of Toronto's glacial systems model to predict the ice sheet formation and permafrost over the last

120,000 years and the impact of such glaciers on the stability and safety of a geologic repository for spent nuclear fuel.

- On April 1, the Oak Ridge National Laboratory (ORNL) published a "Post Irradiation Examination Plan for High Burnup Demonstration Project Sister Rods." The Plan described DOE's ten year experimental work to characterize the high burnup spent nuclear fuel for storage and future transport. The detailed examinations will fill in most of the spent fuel data gaps in understanding high burnup fuel irradiation effects from pressurized water reactors. Some of the sister rods actually come from spent fuel assemblies that were placed in dry storage.
- On April 4, the Wiscasset newspaper wrote an article on the federal government's latest efforts to hold a series of public meetings to get input from local, state and tribal stakeholders on developing a national consent-based siting approach for host communities wishing to site a spent nuclear fuel storage or disposal facility. DOE invited Wiscasset officials to attend the meeting that will be held in Boston on the evening of June 2.
- On April 5, California Representative Issa sent a letter to Energy Secretary Moniz requesting that the Secretary add another public meeting in Southern California to DOE's initial schedule of a series of eight consent-based siting meetings. His plea was based on Southern California Edison's announcement to decommission their three reactors at the San Onofre site and subsequent storage of their spent nuclear fuel on the coast of California, the reactors location near an active fault line, Interstate-5 Freeway, and the eight million residents in Orange and San Diego Counties.
- On April 7, the Federal Claims Judge issued his long awaited decision on the three Yankees' (Connecticut Yankee, Maine Yankee, and Yankee Atomic in Massachusetts) Phase III litigation against the federal government for its failure to take title and possession of the three sites spent nuclear fuel and Greater Than Class C wastes. The Judge awarded about \$76.8 million with Connecticut Yankee receiving \$32.6 million, Maine Yankee receiving about \$24.6 million, and the remaining \$19.6 million for Yankee Atomic.
- On April 11, DOE held its second consent-based siting meeting to gain public feedback on its development of a national consent-based siting process for potential host communities that wish to store or dispose of spent nuclear fuel and high-level waste. The meeting followed the same format as the first meeting in Chicago last month with a speakers' panel, a question and answer period between the public and the panel members followed by small group discussions and a summary of the highlights from the small group discussions.
- On April 12, the National Transportation Stakeholders Forum's Rail/Routing Working Group presented a webinar on rail transportation safety. The Federal Railroad Administration (FRA) presentation informed how carriers choose the safest and most secure routes by analyzing the previous year's 27 risk factors to designate primary and alternate routes for certain high hazard materials such as spent nuclear fuel. The FRA noted that the high hazard materials' shipments were usually classified as containing security sensitive information and therefore restricted from public disclosure.
- On April 12, Senator Heller from Nevada sent a letter to the Chair and Ranking Member of the House Appropriations Committee's Subcommittee on Energy, Water, and Related Agencies urging them to eliminate the funding in the proposed appropriations bill for the Yucca Mountain project that earmarked \$150 million for DOE and \$20 million for NRC to continue the licensing process. The Senator advocated instead that the funds be assigned to DOE to support their consent-based siting approach currently underway.
- On April 13, Senator Heller sent a similar letter to Chair and Ranking Member of the Senate Appropriations Committee's Subcommittee on Energy and Water Development urging them to honor the State of Nevada's wishes and reject any funding proposal for the Yucca Mountain Project and instead fund DOE's consent-based initiative and efforts to develop long-term storage options for spent nuclear fuel.

- On April 13, both the House and Senate Appropriations Subcommittees on Energy and Water development held hearings to discuss the markups of their respective appropriations legislation for Fiscal Year 2017. The House favored the law of the land, the Nuclear Waste Policy Act, which designated Yucca Mountain in Nevada as the disposal site for spent nuclear fuel and high-level waste and provided \$150 million for DOE's Nuclear Waste Disposal Program and \$20 million for the NRC to continue the Yucca Mountain licensing process. In their version the Senate provided \$61 million for a pilot program for consolidating nuclear waste storage for shutdown reactor sites, for the development of a transportation system for the spent fuel, and allowed DOE to store nuclear waste at privately owned facilities that are licensed by the NRC.
- On April 26, Holtec International marked the 30 year anniversary of the Chernobyl disaster by providing the Ukraine President with a tour of the company's and the world's largest Interim Spent Fuel Storage Facility. The Facility will house all of the spent nuclear fuel from the three of the four shutdown reactors at the Chernobyl site. The Facility will have enough concrete silos to store more than 42,000 fuel assemblies, the equivalent of 1,750 casks or nearly 30 Maine Yankee storage sites.
- On April 28, Waste Control Specialists (WCS), with the support of partners AREVA and NAC International, submitted to the NRC a license application to construct and operate a Consolidated Interim Storage Facility for spent nuclear fuel in Andrews County in west Texas. The WCS application proposed an initial 40 year storage license for 40,000 metric tons of heavy metal to be built in eight phases with each phase containing 5,000 metric tons.
- On May 4, DOE published an information fact sheet for its pending shipment of three vitrification components from the West Valley Demonstration Project in New York to the low-level radioactive waste facility in Andrews, Texas. The components were central to the solidification of high-level radioactive waste into glass logs from the reprocessing of commercial spent nuclear fuel. The components, (the Melter, the Concentrator Feed Makeup Tank, and the Melter Feed Hold Tank) were packaged into custom-built waste containers of six-inch thick steel walls and shipped by a heavy haul truck to a railroad transload station near the West Valley site and then loaded onto a railcar directly to the WCS's site in Texas.
- On May 5, the NRC published and released its Final Supplement to the Yucca Mountain Environmental Impact Statement (EIS). The publication supplements the DOE's two EIS's that were prepared in 2002 and 2008 on the proposed Yucca Mountain repository. The NRC staff concluded that the potential radiological and chemical impacts on the aquifer and surface groundwater discharges would be "small" with a peak annual radiation dose of 1.3 mrem from pumping and irrigation at the Amargosa Farms, about twenty miles from the center of the proposed Yucca Mountain repository.
- On May 18, Boston Edison Company, now known as NSTAR Electric Company, sued the federal government in the U.S. Court of Federal Claims over its continued obligation to pay for the storage of spent nuclear fuel at the Pilgrim Nuclear Power Station in Plymouth, Massachusetts.
- On May 23, the Nuclear Waste Technical Review Board sent a letter to DOE's Assistant Secretary of Nuclear Energy offering several observations and recommendations on DOE's research and development activities on the performance of high-burnup spent fuel (HBF) during storage and transportation. The observations centered on the implications of long term dry storage on HBF as it relates to transportation, possible repackaging and eventual disposal after extended periods in dry storage, the reorienting of the hydrides to make the cladding more brittle, and additional stresses in the spent fuel's cladding caused by the increase concentration of metal hydrides and higher internal fission gas pressures. The Board recommended that the research focus on the likelihood and consequences of HBF cladding failure during storage and under expected vibrational loads from rail or road transportation.
- On June 2, the DOE held its fifth national Consent-Based Siting meeting in Boston. The welcoming remarks were presented by the honorable Marge Kil Kelly, a former state Representative and Senator from Wiscasset, Maine and current Senior Policy Advisor to U.S. Senator Angus King. She elaborated

on her fifteen years of experience with the Maine Yankee Community Advisor Panel (CAP), which she chaired, and how the CAP was instrumental in assisting local people to voice their concerns such as the jet engine type noise caused by the outdoor heat exchangers. Maine Yankee responded to the neighbors' concerns by redesigning the pitch and speed of the cooling blades to lower the noise. Examples like this and its drive for transparency resulted in the community trusting the CAP to have their voices heard and their issues resolved, which was vital during the decommissioning. Wiscasset Board of Selectmen Chair Ben Rines "read a resolution that was adopted by Wiscasset voters in 2001, which asked the federal government to take immediate possession of the remaining nuclear waste at the Maine Yankee site."

- On June 3, the U.S. Court of Appeals denied the states of Connecticut, New York, and Vermont, the Prairie Island Indian Community, and numerous environmental organizations' arguments that the NRC had not appropriately characterized its Continued Storage Rule, considered alternatives and mitigation measures, and insufficiently analyzed the impacts of continued storage of spent fuel. The Court disagreed that the NRC engaged in arbitrary or capricious decision-making and elaborated on its reasons why the NRC met all the legal requirements in all cases.
- On June 3, DOE held an informal meeting with local officials and the public in Wiscasset. The informal meeting included selectmen, town officials, residents, county officials, State, representatives of Maine's congressional delegation, and Maine Yankee. DOE's Associate Deputy Assistant Secretary outlined a brief state of affairs and informed the attendees of what DOE was doing and to listen to what the local communities had to say.
- On June 10, the Chairman of the Spink County Board of Commissioners in South Dakota declared that county residents opposed the DOE research initiative to drill a deep borehole to test rocks up to three miles deep underground even though no defense-related nuclear waste would be buried in the borehole. The Chair informed Battelle, DOE's contractor on the Borehole Project, that the Board would not be able "to secure the four votes needed in order to pass an application for Special Exception required for the project to begin."
- On June 22, NRC officials notified Waste Control Specialists (WCS) that their License Application for a consolidated interim storage facility lacked "sufficient technical information" and safety- and security-related details. NRC gave WCS until July 28 to respond to staff's request for additional information.
- On June 30, the Radiation Safety Authority of Sweden endorsed plans to build a high-level radioactive waste repository near Osthrammar, about 100 miles north of Stockholm, Sweden and noted that the "repository fulfilled their nuclear safety and radiation protection requirements" for its design life of 100,000 years. The "Swedish government will decide whether to grant a permit, pending a hearing in an environmental court in Stockholm."
- On July 5, a German Commission submitted its final report to the German government on how best to dispose of high level waste in a geologic repository. The Commission was formed in 2014 after the German government stopped all of its activities and announced a new site selection process. The report stated that the best site would be determined by a three phase approach that would include "extensive public participation" at the "regional, inter-regional, and national level." The Commission reported that the repository could be located in salt, clay or crystalline formations and that it would not exclude the controversial Gorleben rock salt formation.
- On July 6, Representative Dold from Illinois introduced legislation to reimburse communities with shutdown reactor sites that stored spent nuclear fuel. The proposed legislation would direct the Energy Secretary to provide local communities with stranded spent nuclear fuel, such as Wiscasset, some financial relief. The \$100 million fund would be available for the next seven fiscal years starting in 2017 and ending in 2023. The local communities would be paid \$15 per kilogram of spent nuclear fuel. Currently, thirteen communities, including Wiscasset, would qualify for the payment. It is estimated that Maine Yankee has 540 metric tons of spent nuclear fuel in storage. That would amount to an annual payment of \$8.1 million to the Town of Wiscasset for the next seven years.

- On July 7, Senator Heller from Nevada sent a letter to the Chair of the Energy and Commerce Subcommittee on Environment and Economy echoing his opposition to a hearing focused on Yucca Mountain. The Senator believed they were in agreement on the urgency for implementing a program to store and dispose of the nation's spent nuclear fuel and high level waste, highlighted DOE's recent initiative on consent-based siting, and requested the Chair's support for DOE's initiative as a means of developing long term solutions for the nation's nuclear stockpile.
- On July 7, the House Subcommittee on Environment and the Economy held a hearing, entitled "Federal, State, and Local Agreements and Associated Benefits for Spent Nuclear Fuel Disposal." The Subcommittee hoped to address at the hearing a) "historical issues associated with benefits and administrative costs; b) "legislative and administrative options for Federal, State, Local, and Tribal partnerships to site, operate, and oversee a nuclear waste repository; and c) options for State and Local oversight in safety and regulatory issues." Eight witnesses were invited to testify. Three were from Nevada's congressional delegation, one was from Nevada's State Legislature, one from Nevada's Nye County, one congressional representative from Illinois, one a business owner, and one union representative. Two of the eight witnesses opposed the Yucca Mountain facility, two were willing to discuss the project, and four were supportive.
- On July 12, the Nevada Board of Examiners approved an additional \$2.5 million in addition to the \$5 million already approved to maintain its vigilance to fight and prevent the proposed geologic repository at Yucca Mountain.
- On July 13, the Acting Assistant Secretary for Nuclear Energy responded to the Nuclear Waste Technical Review Board's May 23 letter by providing responses to the Board's three recommendations. On the first recommendation DOE chose a more comprehensive systems engineering approach to cladding behavior and failure in storage or during transportation as opposed to a risk approach by performing a gap analysis of the information needed to identify and better understand the mechanisms of cladding failure and to prioritize these gaps. On the Board's second recommendation on the behavior of unirradiated versus irradiated cladding, DOE acknowledged that the subject matter had merit. However, DOE noted that leading scientists and the NRC questioned the benefit of pursuing this issue. In light of funding restraints, DOE related that they believed that stress corrosion cracking of stainless steel canisters and on-going research on irradiated cladding were the more top priority issues. As for the Board's final recommendation on integrating various research ventures with universities and international agencies, DOE agreed that more clarity was necessary. However, DOE also noted that they have established in some instances a successful communication link between DOE and the universities, but this attribute was not communicated well to the Board.
- On July 25, the Associated Press reported that Waste Control Specialists of Texas sent a letter to NRC requesting them to start an environmental review of the site so that it could begin stakeholder meetings with the public.
- On July 26, Duke Energy Corporation submitted a letter to DOE outlining its comments to DOE's consent-based siting initiative. The Corporation urged DOE to fulfill its legal and contractual obligation to remove the spent fuel from their eleven reactor sites and encouraged DOE to regain the public's trust by restarting the Yucca Mountain licensing process.
- On July 26, the Council of State Governments put on a webinar, entitled "Nuclear Waste Policy – Searching for Solutions" with featured speakers from DOE, Waste Control Specialists (WCS) of Texas, and the Eddy-Lea Alliance (ELEA) of New Mexico. DOE stated that there was mistrust of the federal government in general and DOE specifically, anxiety over transportation risks, the importance of environmental justice, and unwanted burden imposed on shutdown reactor sites while waiting for a solution. WCS informed the attendees that their license application for a storage facility would cover 80% of the spent nuclear fuel at shutdown sites. ELEA expounded on the inherent enhanced security associated with their underground storage facility and the benefits of their site such as a remote location, geologic stability, dry area, rail infrastructure, nuclear workforce, and strong public consent.

- On July 29, the Nuclear Energy Institute (NEI) submitted their letter and comments to DOE's consent-based siting process. NEI advised DOE that it was still obligated to follow the mandates of the Nuclear Waste Policy Act (NWPA), that pursuing a consent-based siting process did not rescind their obligation to comply with the NWPA, and that DOE should not expend assets from the Nuclear Waste Fund on programs not authorized by the NWPA. The brief went on to list six successful siting efforts such as the Olkiluoto Island geologic repository in Finland, the Waste Control Specialists consolidated interim storage facility in Texas, the Holtec storage facility in New Mexico, the Nye County Nevada early warning drilling program for the Yucca Mountain project, the Cigeo deep geologic disposal facility in France, and the Canadian Nuclear Waste Management Organization's siting approach.
- On July 29, the Asian Scientist Magazine reported that scientists at the Riken research facility in Japan have found a new way to convert radioactive elements in nuclear waste into stable, non-radioactive elements, or radioactive elements with much shorter half-lives. The scientists used the Superconducting Ring Cyclotron at Riken to accelerate radioactive elements of Cesium-137 and Strontium-90 and forced them to collide with lighter targets with 89% of the Cesium-137 atoms and 96% of the Strontium-90 atoms "transmuted into either stable nuclei or short-lived species with half-lives under one year."
- On July 29, the Nevada Agency for Nuclear Projects submitted their comments on consent-based siting supporting DOE's initiative to find workable alternatives to Yucca Mountain, reiterated the State's opposition to Yucca Mountain, recommended consent from the host state and county, establish generic repository safety standards, and, finally, the adoption of the 2006 National Academy of Sciences' transportation safety and security measures.
- On July 29, Holtec International announced that it had completed its safety analysis that would allow the storage of a horizontal canister into its HI-STORM UMAX subterranean up-right system, like the one planned for the Eddy-Lea Alliance consolidated interim storage site in New Mexico, and allowed Holtec to meet its goal "to provide a state-of-the-art universal storage system" that could "store all of the used fuel and high level waste bearing canisters scattered at sites around the country."
- On July 31, the Nuclear Waste Strategy Coalition submitted their comments on DOE's consent-based siting process and called upon the federal government to remove the spent nuclear fuel from nuclear generating facilities. The Coalition listed five key points for DOE to focus on such as transportation and other key elements, to complete of the Yucca Mountain license application, to implement a pilot consolidated interim storage facility with priority for shutdown reactor sites, funding and governance reforms.
- On August 3, the local newspaper of Halifax, Massachusetts, reported that the lawsuit filed by local residents in 2013 against the Town of Plymouth and Entergy over violations of local zoning laws will go to trial on August 8 in Boston. The plaintiffs maintained that the town building inspector illegally approved Entergy's storage facility for the Pilgrim Nuclear Power Station as an "as of right" use without the need of a special permit.
- On August 5, DOE posted a new solicitation for a deep borehole field test. The research project will evaluate deep drilling technologies and characterize deep geologic environments over time without the use of any radioactive waste. The previous two proposals, one in North Dakota and one in South Dakota, were rejected by local residents.
- On August 11, the Wyoming Legislature's Joint Minerals, Business and Economic Development Committee voted 8 to 5 to update a state law that would allow for temporary storage of spent nuclear fuel and high-level radioactive waste.
- On August 19, the NRC announced that all of the 3.692 million documents from the Yucca Mountain licensing process will be publicly available on their online database, Agencywide Documents Access and Management System (ADAMS). Prior to this only those submitted by the NRC staff as discovery documents were publicly available.
- On August 22, WCS met with the NRC to discuss the NRC's Request for Supplemental Information on WCS's consolidated interim storage license application. WCS re-emphasized that their initial license

application would focus on shutdown sites, such as Maine Yankee, would limit the contents and canister designs to those already approved by the NRC, and allow only those canisters that meet their licensing basis to be shipped to their facility.

- On September 8, the Greenland Analogue Project, made up of nuclear waste management organizations from Canada, Sweden and Finland, published its findings from a five year international project to study conditions at the surface and below the Greenland Ice Sheet and its impact on the future safety of deep geological repositories over time frames up to a million years. The studies involved direct and indirect observations of ice sheet movement, meltwater runoff, water pressure due to the weight of the ice sheet, and water transfer from the ice sheet to areas below the ice surface. The studies confirmed earlier assessments that the average water pressure under the entire ice sheet was about 92% of the thickness of the ice. All three countries have experienced multiple ice ages over the last million years.
- On September 13, Holtec International announced that the State of New Mexico had approved a land sale option for Holtec International to buy 1,000 acres of land from the Eddy-Lea Energy Alliance. The acquisition would allow Holtec International to build their HI-STORE underground storage facility for spent nuclear fuel.
- On September 15, DOE held a public meeting in Washington to present a summary of the public input they received from eight regional meetings on establishing a national, generic consent-based siting process for the storage or disposal of spent nuclear fuel and high-level radioactive waste. The DOE summary included the nature of consent, the meaning of informed consent, equity and environmental and social justice concerns, intergenerational equity and the durability of consent, an oversight or regulatory role for states, tribes, and local governments, trust and credibility, the need for a new waste management organization, transportation, and stabilizing funding. DOE mentioned their request for a \$25 million dollar appropriation from Congress for grants or cooperative agreements to engage hosting communities, to design of spent fuel cask railcars with advanced sensors and braking systems, and to ensure an adaptive consent-based siting process.
- On September 19, the Australian Broadcasting Corporation reported that South Australia's Premier was visiting Finland touring Finland's underground nuclear waste disposal facility at Eurajoki, Finland. The Premier was researching the possibility of South Australia accepting spent nuclear fuel from other countries as part of a long-term economic prosperity plan that could bring in \$100 billion.
- On September 21, Holtec International issued a press release that it had successfully tested a first of its kind rectangular transport cask for high-level waste. The quarter scale model was subjected to three successive 30 foot drops from three different angles, a top down oblique drop, a center of gravity over the corner drop, and a puncture drop. The rectangular cask had no damage to its containment boundary.
- On September 21, the NRC held a webinar for State Liaison Officers and Indian Tribes on "Dry Storage and Transportation of High Burnup Fuel." The webinar explained how high burnup accelerates hydrogen pickup and oxidation of the cladding that contains the fuel pellets, increases fuel pellet swelling and fuel rod internal pressures, and changes some of the mechanical properties of the fuel rod. High internal pressures can lead to cladding thinning which can increase the likelihood of hairline cracks or ruptures. Hydrogen re-orientation can affect the cladding's mechanical properties over time such as its ability to be stretched under stress. During normal transport a transportation cask can experience a large number of vibrations or bouncing, which can result in bending and fatigue failure of the cladding.
- On September 22, the DOE issued a new bid for a characterization project that would perform a "Deep Borehole Field Test" that specifically requested public engagement from the beginning, including staff that would remain onsite day-to-day to hear local concerns, and for bidders to show how the project could benefit the community through science education or additional research.
- On September 26, Lawrence Berkeley National Laboratory presented at the Geological Society of America's annual meeting in Denver an overview of current research and development activities in the U.S. disposal research program involving international collaboration with a specific focus on participation in field experiments conducted in underground research laboratories. This association

allows U.S. researchers to benefit from decades of underground research in valuable field experiments at the Mont Terri Clay Project in Switzerland, the crystalline rock research in South Korea, Sweden, and Finland, the benchmark salt study in Germany, and the borehole studies in Sweden. The involvement has led to an improved understanding of field variations, engineered barriers, and radioactive migration.

- On September 26, a local newspaper in South Carolina reported that a plan had surfaced to build an interim nuclear waste storage site. Apparently, the Spent Fuel Reprocessing Group wanted federal approval to move the spent fuel from the state's four nuclear power plants and store it indefinitely at the new facility. The NRC had received notice of the plan in July. The Governor expressed reservations at the announcement.
- On September 26, the Nuclear Waste Strategy Coalition sent a letter to Energy Secretary Moniz pressing him to seek funding in the Fiscal Year 2018 budget for a successful integrated waste management system by implementing such crucial items as preparing the nation's infrastructure for shipping spent nuclear fuel, assisting tribal, state and local governments on emergency preparedness, completing the Yucca Mountain licensing process, supporting consolidated interim storage with priority given to shutdown sites, and re-establishing the Nuclear Waste Policy Act's Office of Civilian Radioactive Waste Management to manage the nation's nuclear waste stockpile.
- On September 27, the Bipartisan Policy Center, a Washington think tank, released a publication entitled, "Moving Forward with Consent-based Siting for Nuclear Waste Facilities," on the recommendations from their Nuclear Waste Council. The Council noted that in 1990 academic researchers, public officials, and private sector representatives developed a "Facility Siting Credo" that involved 14 steps to a successful siting process, which was reaffirmed by the Blue Ribbon Commission's 2012 report. The report contrasted the siting outcomes between Yucca Mountain in Nevada and the Waste Isolation Pilot Project in New Mexico.
- On October 4, the Town of Rowe, Massachusetts was seeking federal compensation for hosting a spent nuclear fuel storage facility in their backyard. The local officials expressed their support for bipartisan legislation "that would compensate communities that are forced to store nuclear waste." The proposed legislation sponsored by Illinois Representative Dold, the Interim Spent Nuclear Fuel Storage Compensation Act, would provide "up to \$100 million for 13 towns ranging from Zion, Illinois to Wiscasset, Maine."
- On October 7, the Director of the Division of Spent Fuel Management at NRC informed the Vice President of Waste Control Specialists (WCS) of the staff's decision to start the environmental assessment process on WCS's license application to construct and operate a consolidated interim storage facility in Andrews County, Texas. The staff believed that an early start of the environmental assessment would assist them in engaging the public, consulting with tribes and other government agencies from the local to federal level.
- On October 13, the U.S. Court of Federal Claims awarded Entergy Nuclear \$34.5 million for damages resulting from the federal government's failure to take title and possession of the spent nuclear fuel at the Indian Point 2 nuclear facility, 25 miles north of New York City.
- On October 15, researchers at the Ecole Polytechnique Federale de Lausanne reported that underground nuclear waste repositories could benefit from a porous layer of material that could be placed between bentonite clay and rock to help bacteria metabolize the build-up of hydrogen gas from corroding steel containers, thereby making the repositories safer. The bacteria, which get their energy from the sulfate in the host rock and hydrogen, were discovered about 1000 feet underground at the Mont Terri Rock Laboratory, the future disposal site for Switzerland's spent nuclear fuel.
- On October 18, the Taiwan Power Company (Taipower) announced that it was considering the possibility of building a final disposal site for spent nuclear fuel on the seabed off the coast of Wuqiu or Daren Townships. Wuqiu is an island near the coast of China whereas Daren is on the island of Taiwan. The Company raised the prospect of using an uninhabited island to build a tunnel under the sea to the seabed site.

- On October 21, Battelle reported that it could be drilling a three-mile deep borehole in Dale County, Alabama on property owned by Southern Company. The Dale County Commission passed a resolution in favor of the project. However, nearby residents and the Newton Town Council opposed the project. The research project would attempt to prove the feasibility of drilling an 8.5 inch hole three miles deep while gathering useful information on rocks, fluids and temperatures. The research information could lead to drilling boreholes elsewhere for the future disposal of weapons related nuclear waste.
- On October 21, the La Crosse Tribune announced that the Daily Power Cooperative won a \$73.5 million settlement against the federal government for storing spent fuel that the government was supposed to take away. The company initially filed for \$85.2 million in damages. The small 50 megawatt reactor was shut down in 1987 and the spent fuel has been in storage since.
- On October 26, four environmental and public policy organizations (Beyond Nuclear, Nuclear Information and Resource Service, Public Citizen, Inc. and SEED Coalition) submitted a letter to the NRC requesting that they dismiss WCS' application for an interim storage facility for spent nuclear fuel in Andrews County, Texas. They contended that the "Nuclear Waste Policy Act contained no provision that would allow DOE to assume title and responsibility for the spent fuel at the proposed CSIF."
- On October 27, the Executive Director of the Nevada Agency for Nuclear Projects forwarded a letter to DOE to comment on DOE's draft report on "Designing a Consent-Based Siting Process: Summary of Public Input." The Nevada Agency supported such a process for alternatives to Yucca Mountain, but noted that Nevada's opposition to Yucca Mountain still remained, advocated for obtaining written consent from a potential host state, county, affected Indian tribe, and any adjacent county affected by transportation before using any funds from the Nuclear Waste Fund, and urged DOE to consult with the NRC and the Environmental Protection Agency on developing generic disposal standards.
- On October 27, DOE issued a Notice in the Federal Register requesting information on private initiatives for developing consolidated interim storage facilities. DOE was seeking feedback on key questions on what role private storage facilities could play in DOE's integrated waste management system.
- On November 14, NRC announced that they were seeking comments from the public as to the extent and scope of what their environmental review should encompass on the Waste Control Specialists' (WCS) license application to construct and operate a spent nuclear fuel storage facility in Andrews County, Texas. Even though the NRC has not yet accepted the WCS application for technical review, they do have the requisite information to begin the environmental scoping process.
- On November 22, Marge Kilkelly, Senior Policy Advisor to Senator Angus King, presented to the Wiscasset Board of Selectman a proposal to form an alliance with 13 other communities across the country storing spent nuclear fuel as an information-sharing network. The proposal would also include a transportation infrastructure analysis surrounding each storage facility to decide how to move the spent fuel to a permanent site. The Board did not immediately vote on the proposal.
- On November 29, AREVA Federal Services reported that they had completed Phase I of their three phase, Department of Energy project to design and fabricate a prototype railcar for the transportation of high-level radioactive material to the Association of American Railroads' standards. The Phase I work included the mobilization and conceptual design of the railcar and its associated buffer railcars, the design of the cradles for securing the high-level waste, the general loading procedures, and the cask railcar's operational and maintenance requirements.
- On December 1, Maine Yankee paid in full \$186.4 million from its Spent Fuel Disposal Trust Fund to the federal government the money it owed for its pre-1983 spent fuel obligation as mandated by the Nuclear Waste Policy Act of 1982. Under the Act the Nuclear Waste Fund was established to construct and operate a geologic repository for the disposal of spent nuclear fuel and high level radioactive waste by assessing a fee of 0.1cents per kilowatt-hour generated by nuclear utilities starting in 1983. Prior to 1983, the Act allowed utilities to either pay their pre-1983 nuclear generation obligation or wait until the

DOE fulfilled its obligation to begin removing the spent nuclear fuel or at some time prior to that of the utilities choosing.

- On December 6, the Finnish Radiation and Nuclear Safety Authority confirmed that the waste management company of Posiva began underground excavations of the world's first geologic repository for spent nuclear fuel on Olkiluoto Island, in the western part of the country and expected the repository to begin operations in 2023.
- On December 6, DOE's National Transportation Stakeholders Forum featured in its newsletter an article on Maine Yankee's cask lid lift project and a demonstration of a first of its kind robotic camera system to inspect dry storage canisters. Maine Yankee undertook the cask lid lift as part of its aging management program and in preparation for its upcoming license renewal application submittal in 2020 to the NRC. Both the lid lift and the robotic demonstration were successful. There was very little moisture and surface salt underneath the lid and in the vents, and the robot was able to move up and down the entire 14 foot length of the canister from three of its four top vents.
- On December 13, the Nuclear Waste Strategy Coalition sent a letter to President-Elect Trump advocating the completion of the Yucca Mountain license application for disposing of spent nuclear fuel, initiating a pilot project for consolidated interim storage for spent nuclear fuel stranded at shutdown sites, like Maine Yankee, and providing assistance to state and tribal governments for emergency preparedness in preparation for a national shipping campaign.
- On December 14, DOE's Office of Inspector General released its annual audit report of DOE's Nuclear Waste Fund for Fiscal Year 2016. According to the report the Fund grew \$1.4 billion from interest received to \$38.8 billion at the end of September 30, 2016. Since the federal government has failed to take the spent nuclear fuel from the shutdown and operating nuclear plants, \$6.1 billion has been paid from the U.S. Treasury's Judgment Fund as of September 30. Since lawsuits were expected to continue until the federal government takes possession of the stored spent nuclear fuel, the remaining federal liability was estimated at \$24.7 billion.
- On December 14, the Western Governors Association adopted a policy resolution that 1) required the specific consent of a Governor for any private or federal storage facility located within their borders, 2) transportation must be a crucial part of an integrated waste management program, 3) the Governors support federal alternative waste acceptance options such as DOE taking title to the spent nuclear fuel at individual reactor and shutdown sites, 4) the NRC and DOE comply with any and all agreements negotiated by a state's Governor, 5) the federal government reimburse the states' costs associated with shipments to any interim storage facility, and 6) spent nuclear fuel remain at reactor sites until the DOE and nuclear utilities implement a mutually agreeable transportation plan with states along the transportation corridor and fund state and local emergency and medical responder training and resources in the event of an accident or terrorist attack.
- On December 16, DOE released a draft plan for a defense-only waste repository for the permanent disposal of all or some of its defense wastes and is seeking public input on its proposal. The plan is independent of location and disposal medium, and stressed a consent-based siting process. The plan's principle elements focus on the technical aspects of the siting process, preliminary schedules and cost estimates, the types and quantities of spent nuclear fuel and high-level radioactive waste, transportation, and the repository's characteristics for permanent disposal.
- On December 19, DOE announced it has selected four companies to study the feasibility of deep boreholes to dispose of certain types of defense-related, high level radioactive waste. The engineering challenge will be to drill an 8-inch, vertical borehole to a depth of three miles below the earth's surface to collect information on the rock type, water chemistry, rock temperatures, and other geologic data. The four companies selected were AECOM, which is investigating a site in Texas, ENERCON and TerranearPMC, which are both exploring sites in New Mexico, and RE/SPEC, which is surveying a site in South Dakota.