

State Nuclear Safety Inspector Office  
Maine CDC – DHHS

November 2012 Monthly Report to the Legislature

Executive Summary

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

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

LOCAL:

- On November 24<sup>th</sup> a 2.6 magnitude earthquake occurred near the city of Belfast. The tremor was lower in magnitude and not as widely felt as the 4.0 that happened on October 16<sup>th</sup> near Hollis Center. Since there was no movement of the concrete casks at the storage facility in Wiscasset for the 4.0 earthquake and this tremor was at least ten times lower in intensity than the previous one, it was not necessary to inspect the casks on this smaller tremor.
- The third quarter results of the State's environmental radiation surveillance program continued to illustrate three distinct groupings with one station that has been historically high. The highest station recorded an average exposure of 29.5 as compared to normal background levels of 15 to 30 on the coast of Maine. Even though the third quarter results exhibited the expected seasonal fluctuations due to Radon gas, some of the data revealed some inconsistencies between stations and background levels. The rise in natural background levels was more than expected and not readily explainable. This has prompted on-going discussions with the State's processing vendor for explanations on some of the results.

The national highlights primarily focused on the Nuclear Regulatory Commission's activities.

National:

- The Nuclear Regulatory Commission's Atomic Safety and Licensing Board held a pre-hearing conference to hear legal "arguments on the Prairie Island Indian Community's admissibility of their seven contentions challenging the license renewal application for the Independent Spent Fuel Storage Installation" at the Prairie Island Nuclear Plant in Red Wing, Minnesota. One of the Community's contentions involved the duration of the spent fuel stored at the dry cask facility. The tribe's case is bolstered by a recent Circuit Court decision, which vacated the Nuclear Regulatory Commission's rule allowing it to make licensing decisions without considering the long term impact of waste storage.
- The Nuclear Regulatory Commission (NRC) held a Waste Confidence scoping meeting for the Environmental Impact Statement (EIS) that it is preparing to respond to the U.S. Court of Appeals June Order vacating the NRC's 2010 waste confidence decision and extended temporary storage rule. The purpose of the meeting was to provide a brief overview of the NRC's scoping process and to provide an

opportunity for the public to comment on the extent of the scope of the EIS. The staff offered three possible scenarios as part of its EIS deliberations:

- Storage until a repository becomes available at the middle of this century,
- Storage until a repository becomes available at the end of this century, or
- Continue storing indefinitely in the event that a repository is not available.

The staff welcomed feedback on what scenarios and environmental issues it should consider. It also provided a preliminary two year schedule outlining when the EIS would be finalized and published as a rule.

- The Office of Nuclear Energy for the Department of Energy posted a notice to identify potential private-sector resources for a large scale spent nuclear fuel storage demonstration project. Although no funding or program was announced, the solicitation did align with proposals to consolidate used fuel at regional storage facilities in the absence of a geologic repository.

## Introduction

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

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

Commencing with the January 2010 report the glossary and the historical perspective addendum are no longer included in the report. Instead, this information is available at the Radiation Control Program's website noted above. In some situations the footnotes may include some basic information and may redirect the reviewer to the website. In October 2011 the format of the report was changed to include an executive summary which replaced the official memorandum to the legislative leadership transmitting the report. To further streamline efforts, beginning in August of 2012, the report featured hyperlinks to documents that would normally be attached as copies to the report. The hyperlinks should facilitate the reports review with some readers focusing on the report while others who wish to explore the cited documentation can do so.

## Independent Spent Fuel Storage Installation (ISFSI)

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

There were no fire- or security-related impairments for the month. However, there were seven security events logged. Six were related to transitory environmental conditions. The seventh was for the temporary misplacement of a shift key ring.

There were twenty-three condition reports<sup>1</sup> (CR) for the month of November and they are described below.

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

- 1<sup>st</sup> CR: Was written to track open items from the October emergency plan exercise.
- 2<sup>nd</sup> CR: Was written to document an inconsistency in completing an attachment to a surveillance procedure. Appropriate guidance was provided to ensure consistency.
- 3<sup>rd</sup> CR: Was written to document an expired truck inspection.
- 4<sup>th</sup> CR: Was written to track new camera issues.
- 5<sup>th</sup> CR: Documented a problem with the turntable on the man lift.
- 6<sup>th</sup> CR: Was written to document hurricane preparation enhancements gathered from the other New England decommissioned sites.
- 7<sup>th</sup> CR: Was written to track open items from a procurement surveillance.
- 8<sup>th</sup> CR: Was written to document the intermittent loss of signal from one of the fence line radiation monitors.
- 9<sup>th</sup> CR: Was written to document an individual harvesting berries at the site boundary.
- 10<sup>th</sup> CR: Documented a needed update to ensure newly hired individuals are included in the work control database.
- 11<sup>th</sup> CR: Was written to track the resolution of open items from the annual vertical concrete cask inspection.
- 12<sup>th</sup> CR: Documented the temporary misplacement of one shift key ring.
- 13<sup>th</sup> CR: Documented a procedure attachment not being updated when the procedure was revised.
- 14<sup>th</sup> CR: Was written to track the implementation of revision 10 to the cask vendor's multi-purpose canister system's final safety analysis report.
- 15<sup>th</sup> CR: Was written to track the implementation of revision 4 to the cask vendor's multi-purpose canister system's transportation Certificate of Compliance.
- 16<sup>th</sup> CR: Documented the implementation of new EPA regulations for emergency diesel generators.
- 17<sup>th</sup> CR: Documented an individual taking pictures at the property boundary.
- 18<sup>th</sup> CR: Documented the need for improved guidance on how Shift Supervisors report information to the Nuclear Regulatory Commission.
- 19<sup>th</sup> CR: Was written to track recommendations from a self-assessment.
- 20<sup>th</sup> CR: Documented a small leak of brake fluid onto the pavement that was cleaned up immediately.
- 21<sup>st</sup> CR: Documented the need for additional details in documenting security event logs.
- 22<sup>nd</sup> CR: Was written to document the timeliness of a barrier screen not meeting management expectations.
- 23<sup>rd</sup> CR: Documented the failure of the atmospheric air pump used to monitor chlorides in the air. The pump was replaced.

*Other ISFSI Related Activities*

1. On November 13<sup>th</sup> an individual was spotted by the public road on Maine Yankee property picking red berries to decorate Christmas wreaths. Site security intercepted the individual and counseled the person on the security measures at the site. The individual was allowed to leave. Since the activity did not appear suspicious, the local law enforcement agencies were not notified and the incident was not reported to the Nuclear Regulatory Commission's Operations Center.
2. On November 23<sup>rd</sup> a person stopped on Old Ferry Road, walked a few paces onto Maine Yankee's property next to a "No Trespassing" sign and took a few photos and then left the area. The local law enforcement agencies were notified and responded, but were unable to intercept the individual. A courtesy notification was made to the Nuclear Regulatory Commission's Operations Center.
3. On November 24<sup>th</sup> a 2.6 magnitude earthquake occurred near the city of Belfast. The tremor was lower in magnitude and not as widely felt as the 4.0 that happened on October 16<sup>th</sup> near Hollis Center. Since there was no movement of the concrete casks at the storage facility in Wiscasset for the 4.0 earthquake and this tremor was at least ten times lower in intensity than the previous one, it was not necessary to inspect the casks on this smaller tremor.

## Environmental

The State received the third quarter results from the field replacement of its thermoluminescent dosimeters<sup>2</sup> around the ISFSI and the Maine Yankee industrial site. The results from the quarterly TLD change out continued to illustrate three distinct exposure groups: elevated, slightly elevated, and normal. The high station identified was K at 29.5 milliRoentgens<sup>3</sup> (mR). Station G, which has been historically high, decreased to the moderately elevated grouping.

The moderately elevated group increased from the normal four or five stations to eight (F, G, J, L, N, O, P and Q) and averaged 27.1 mR. This quarter the subset of the moderately high group did not materialize as it has in past quarters. The stations continue to trade places, but more so this quarter. For example, station E was in the subset of the moderately high group last quarter, but dropped to the normal group this quarter. Stations N, O, and P, which were in the normal group last quarter, were now in the moderately elevated group this quarter. These deviations will be tracked over the next several quarters to see if a pattern develops. The remaining stations A, B, C, D, E, H, I, and M averaged 24.8 mR.

With so many stations shifting, the data was troubling. The vendor was contacted and requested to re-verify the TLD results for every station and note any unusual results. The vendor reported no unusual results or questionable data and there were no unusual responses from the phosphors that detect the radiation. A further review of the data revealed some inconsistencies, especially with stations G, N, O, and P. Since each station has two TLDs and each TLD has three phosphors, the following table was created to see if any discrepancies existed between individual TLDs. The table below lists the station numbers with their respective TLD phosphors summed. It was apparent that the numbers did not match.

<u>Station #</u>	<u>TLD 1</u>	<u>TLD 2</u>	<u>Difference</u>
G	91	68	23
N	69	94	25
O	88	79	9
P	89	72	17

The historic differences at each TLD station usually ranges from three to five. Three of the four TLDs exhibit very large deviations with the fourth being moderately high. It would seem that the 91 and 94 go together, which would make sense as station G has historically been the higher TLD station. The same would seem to hold true for the 88 and 89 values. However, since both stations O and P are low, it is not readily apparent which station, if any, should be designated as the station with those values. Even though this has never occurred in the eleven years of environmental radiation surveillance of the ISFSI, the only plausible explanation appears to be personnel error, meaning that the individual TLDs were not matched properly when placed at their respective field locations. Internal protocols were reviewed and discussed with the vendor. Some suggestions were made for improvement and those will be incorporated in the next field replacement in January.

The Maine Yankee industrial site TLDs averaged 23.3 mR, which is comparable to the normally expected background radiation levels of 15 to 30 mR on the coast of Maine. Some of the background levels are highly dependent upon tidal effects, and local geology. However, virtually all the stations exhibit seasonal fluctuations that are affected by the out gassing of the naturally radioactive gas, Radon. As expected the third quarter TLD results averaged above the previous two quarters.

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

<sup>3</sup> A milliRoentgen (mR) is a measurement of radiation exposure. For a further explanation, refer to the glossary on the Radiation Program's website.

The control TLDs that are stored at the State's Health and Environmental Testing Laboratory (HETL) in Augusta averaged about 13.9 mR. Although the storing of the control TLDs at HETL's pre-World War II steel vault lowers the natural background values, the 13.9 mR value for this quarter is much higher than expected as compared to last quarter's control results of 10.3 mR. Even though seasonal fluctuations are expected, a 35% increase in the background from one quarter to another in a shielded environment is unusual. It was also noted that the steel shield background has been increasing over the last year with the 13.9 representing a doubling of the background. The State will confer with its TLD vendor on its findings. Nevertheless the data seems to point to the steel vault losing its shielding effectiveness. More evaluations will be performed to see if this is really the case. The controls were initially part of a program to better quantify the individual impacts of storage and transit exposures on the thermoluminescent dosimeters (TLDs). However, as indicated above, they also have been instrumental in pointing out changes that would normally have not been captured if it were not for the program to better quantify the results.

As a further application of this TLD control assessment, on September 18<sup>th</sup> three of the seven control TLDs received for the third quarter of 2012 were returned to the State's TLD vendor, Global Dosimetry in California, for an analysis of the transportation exposures. The initial set of results from the control TLD badges returned indicated an average of 15.2 mR for the total exposure picked up between leaving the vendor, arriving at the State and then immediately being shipped back and received by the vendor. The 15.2 mR represented a fairly large increase of 9.3 mR when compared to last quarter's 5.9 transit badges. About one third of the increase may be attributed to the increased background levels as noted by the controls in HETL's steel vault. However, the remaining increase is presently unexplained and discussions with the vendor are on-going.

The field control TLDs at Ferry Landing on Westport Island, and the roof of the State's Health and Environmental Testing Laboratory read 22.8 and 23.2 mR, respectively. Both TLDs at the Edgecomb Fire Station were apparently lost.

As noted in earlier reports the State's maintains an environmental air sampler on the roof of the Health and Environmental Testing Laboratory (HETL) for local or national events. The air sampler was extremely helpful during last year's Fukushima event in Japan as it was instrumental in quantifying the levels of radioactivity that was coming from the cripple reactors. This year's third quarter results did not identify any unusual radioactive elements and were within historical ranges for both gross beta<sup>4</sup> and Beryllium-7, a naturally radioactive cosmogenic element that is produced from cosmic rays interacting with the nitrogen and oxygen atoms in the atmosphere. The gross beta results ranged from 21.1 to 34.3 femto-curies per cubic meter (fCi/m<sup>3</sup>)<sup>5</sup>. A composite of the five bi-weekly air filter samples was used to measure the Beryllium-7's concentration of 68.4 fCi/m<sup>3</sup>.

For informational purposes Figure 1 on page 6 illustrates the locations of the State's 17 TLD locations in the vicinity of the ISFSI. The State's locations are identified by letters with the highest location being station K.

## Other Newsworthy Items

1. On November 1<sup>st</sup> the Nuclear Waste Strategy Coalition (NWSC) held its bi-weekly conference call to update its membership on the Administration's activities within the Department of Energy (DOE) and the Nuclear Regulatory Commission; the current status of congressional appropriations, and the three cases before the U.S. Court of Appeals for the D.C. Circuit (the fee suspension, waste

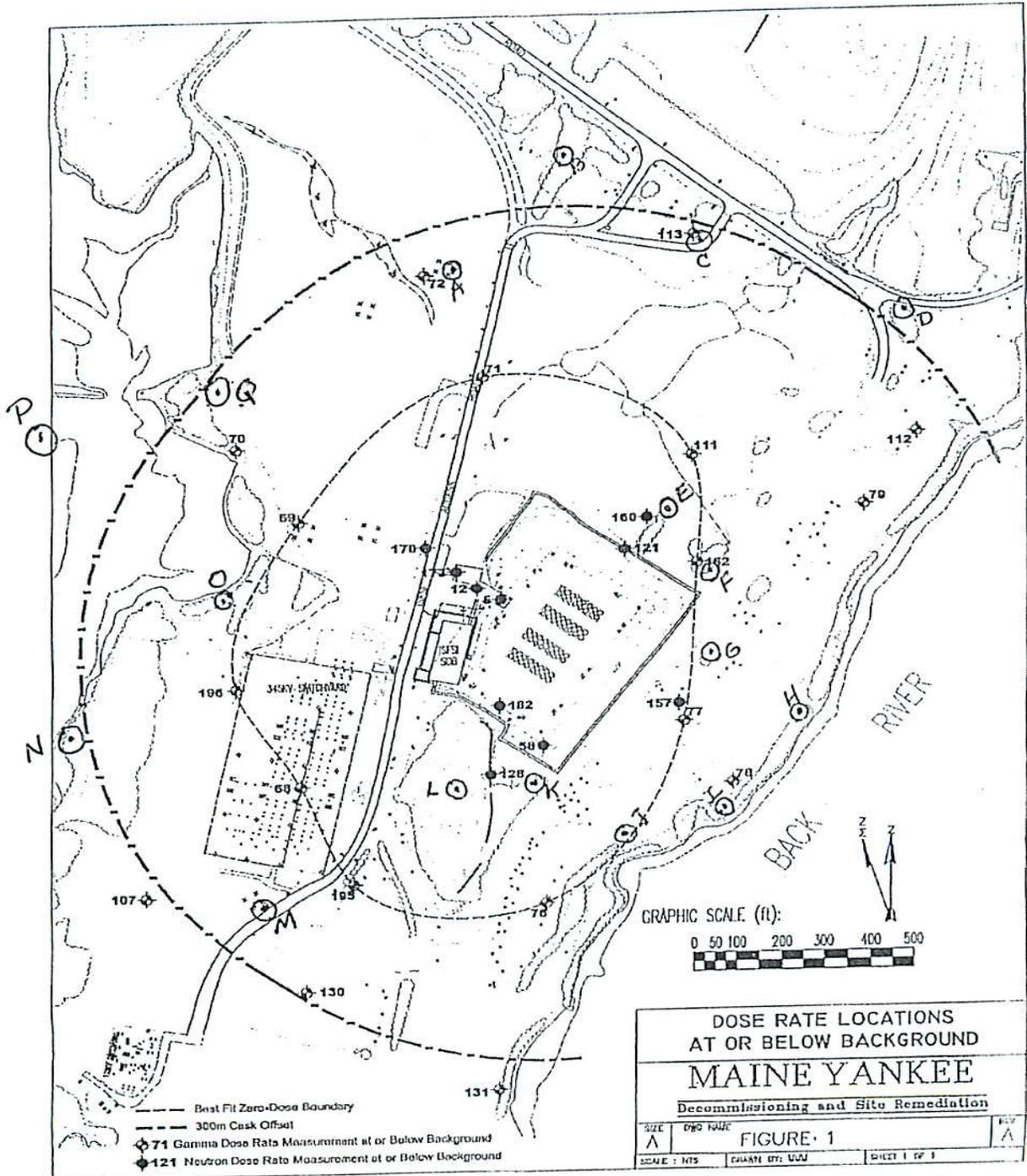
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<sup>4</sup> Gross Beta is a simple screening technique that measures the total number of beta particles emanating from a potentially radioactive sample. High values would prompt further analyses to identify the radioactive species. Refer to the glossary on the website for further information.

<sup>5</sup> A fCi/m<sup>3</sup> is an acronym for a femto-curie per cubic meter, which is a concentration unit that defines how much radioactivity is present in a particular air volume, such as a cubic meter. A "femto" is a scientific prefix for an exponential term that is equivalent to one quadrillionth (1/1,000,000,000,000,000).

confidence, and mandamus); besides upcoming meetings and webinars of interest. Concern was expressed that the congressionally mandated DOE report on the implementation of the Blue Ribbon Commission's recommendations on managing the nation's used nuclear fuel would be further delayed with the anticipated departure of Energy Secretary Chu during President Obama's second term.

Figure 1



2. In the November issue of “[Natural Gas & Electricity](#)” an overview is presented on the costly, endless delays associated with spent fuel storage. The article illustrated how the sluggish federal government response has dashed hopes for a near term solution. The web link for the article can be accessed by positioning the cursor over the underlined text and following the directions.
3. On November 8<sup>th</sup>-9<sup>th</sup> the Nuclear Regulatory Commission’s Atomic Safety and Licensing Board held a pre-hearing conference to hear legal “arguments on the Prairie Island Indian Community’s admissibility of their seven contentions challenging the license renewal application for the Independent Spent Fuel Storage Installation” at the Prairie Island Nuclear Plant in Red Wing, Minnesota. One of the Community’s contentions involved the duration of the spent fuel stored at the dry cask facility. The tribe’s case is bolstered by a recent Circuit Court decision, which vacated the Nuclear Regulatory Commission’s rule allowing it to make licensing decisions without considering the long term impact of waste storage.
4. On November 13<sup>th</sup> the Chairman of the Nuclear Regulatory Commission sent a [letter](#) to Senator Lieberman, Chair of the Homeland Security and Government Affairs Committee, notifying him of the NRC’s response to the Government Accountability Office’s report on spent nuclear fuel. The GAO report expressed concerns over the identification and accessibility of classified studies for storage and disposal of spent nuclear fuel. The Chair related the indexing process that NRC management had implemented to ensure that institutional knowledge would not be lost. The web link for the letter can be accessed by positioning the cursor over the underlined text and following the directions.
5. On November 14<sup>th</sup> the Nuclear Regulatory Commission (NRC) held a Waste Confidence scoping [meeting](#) for the Environmental Impact Statement (EIS) that it is preparing to respond to the U.S. Court of Appeals June Order vacating the NRC’s 2010 waste confidence decision and extended temporary storage rule. The purpose of the meeting was to provide a brief overview of the NRC’s scoping process and to provide an opportunity for the public to comment on the extent of the scope of the EIS. The staff offered three possible scenarios as part of its EIS deliberations:
  - Storage until a repository becomes available at the middle of this century,
  - Storage until a repository becomes available at the end of this century, or
  - Continue storing indefinitely in the event that a repository is not available.

The staff welcomed feedback on what scenarios and environmental issues it should consider. It also provided a preliminary two year schedule outlining when the EIS would be finalized and published as a rule. The web link for the agenda can be accessed by positioning the cursor over the underlined text and following the directions.

6. On November 15<sup>th</sup> the Nuclear Waste Strategy Coalition (NWSC) held its second bi-weekly conference call to update its membership on how the election results did not impact the nation’s nuclear waste policy debate and the Nuclear Regulatory Commission’s (NRC) waste confidence scoping meetings. The industry perspective at the NRC scoping meetings was to limit the scope to what the DC Circuit Court deemed deficient and what needed to be addressed. The environmental groups expressed their concerns that the Nuclear Regulatory Commission’s scoping approach was not as comprehensive as it should be and provided examples such as hardened on-site storage as a means of mitigating armed terrorist attacks. The NWSC is an ad hoc organization of state utility regulators, state attorneys general, consumer advocates, electric utilities, local governments, tribes, and associate members. Its primary focus is to protect ratepayer payments into the Nuclear Waste Fund and to support the removal and ultimate disposal of spent nuclear fuel and high-level radioactive waste currently stranded at numerous sites across the nation.

7. On November 19<sup>th</sup> the Secretary of the Nuclear Regulatory Commission (NRC) issued a [memorandum](#) to the NRC's Executive Director of Operations on the staff's briefing to the Commission on their overview of the spent fuel storage and transportation and the fuel facilities programs. The Commission supported the staff's efficiency and effectiveness efforts in the programs and directed the staff to limit its storage issues to the 120 year timeframe. The meeting was webcast. The web link for the memorandum can be accessed by positioning the cursor over the underlined text and following the prompts.
8. During Thanksgiving week the Office of Nuclear Energy for the Department of Energy posted a notice to identify potential private-sector resources for a large scale spent nuclear fuel storage demonstration project. Although no funding or program was announced, the solicitation did align with proposals to consolidate used fuel at regional storage facilities in the absence of a geologic repository.
9. On November 28<sup>th</sup>-29<sup>th</sup> the Nuclear Energy Insider sponsored a [Nuclear Used Fuel Strategy Conference](#) that was held in Charlotte, North Carolina. The conference focused on such major topics as:
  - Improved Inspection Process for Extended Storage and Transportation
  - Consolidated Interim Storage (International Case Studies and Panel Discussions)
  - Transportation Preparedness and Storage at Operating Facilities and Decommissioned Sites
  - Storage and Transport of High-Burn-Up Fuel
  - Spent Fuel Pool Criticality and Emergency Response Plans
  - Long Term Storage, Ultimate Disposal, and Reprocessing.

The web link for the agenda can be accessed by positioning the cursor over the underlined text and following the directions.

10. On November 29<sup>th</sup> the [Department of Energy](#) (DOE) responded to Duke Energy's Freedom of Information request pertaining to spent fuel or high-level waste reports that the Rand Corporation provided to the DOE. The request was made to gather information from the DOE on the deliberations over its delayed report on its implementation of the Blue Ribbon Commission's recommendations for the management of spent nuclear fuel. The report was due to Congress in late July. The Rand Corporation had submitted a draft report, entitled "Choosing a New Organization for Management and Disposition of Used Fuel and Defense High-Level Nuclear Waste." The Rand report was addressing one of the Blue Ribbon Commission's recommendations by evaluating the optimal management structure for the nation's used nuclear fuel and high-level waste program. Since the report is a draft policy document and pre-decisional, the DOE claimed that it was exempted under the Freedom of Information Act to release the document. The web link for the letter can be accessed by positioning the cursor over the underlined text and following the directions.
11. On November 30<sup>th</sup> Germany's Environmental Minister stated that exploration work on turning the temporary nuclear waste storage facility at Gorleben into a permanent facility will be halted until next year's federal elections. Since 1977 various German governments have tried to make Gorleben a permanent, used nuclear fuel storage facility. With considerable public resistance opposing the storage of spent nuclear fuel in the Gorleben salt mines, politicians recently agreed to start fresh talks on finding a permanent storage site and stop the continuing debate on the suitability of the Gorleben site. The European news was reminiscent of the Yucca Mountain debate and the formation of the Blue Ribbon Commission in the United States.