

Haverkamp, Trisha

From: McKinley, Raymond
Sent: Monday, November 17, 2014 3:05 PM
To: mary.lampert@comcast.net
Subject: Response - Responses to Your Questions Sent 10/06/2014
Attachments: Lampert Pilgrim QA 10-6-2014email.pdf

Mary,

Please see the attached PDF which addresses the questions that you sent in on 10/06/2014.

Sincerely,

Ray McKinley
Chief, Division of Reactor Projects Branch 5
U.S. NRC Region I

From: Mary Lampert [<mailto:mary.lampert@comcast.net>]
Sent: Monday, October 06, 2014 4:37 PM
To: McKinley, Raymond
Subject: RE: Responses to Your Questions: Pilgrim Dry Cask Storage Dated Sept 3 2014

October 6, 2014

Hello Ray:

Thank you for your October 6 response to questions (10.02.14) regarding monitoring. You should get over-time pay or an all-expense paid trip to the Vineyard!

A couple of comments and questions on: monitoring; a building to surround the ISFSI; and generally how the dry storage system will be monitored, inspected, repaired and how fuel assemblies can be retrieved, transferred to another canister or cask, and prepared for transport.

1. **Timing:** Will NRC inspect Entergy's plans for radiation monitoring BEFORE Entergy has moved forward with its plan?

Otherwise the agency gets caught in a fait accompli that makes it unlikely that NRC would direct Entergy to change course and put something else in place that would better protect public health and safety.

2. **TLD's:** How can NRC justify approving TLDs to monitor Pilgrim's casks considering their deficiencies?

For example:

- TLD's provide only an average figure, and increases of potential significance can be masked by lower than average readings during other parts of the month. Biological impact occurs on a daily basis.
- TLD's can only read to a maximum threshold, that is, like a film badge they can only read so high.
- TLD's do not read high or low let alpha and beta.

3. **Real-Time, Computer-Linked Monitors** are readily available and relatively cheap. They enable the licensee, NRC and public to know what is going on immediately so mitigation can occur.

- Will NRC require real-time computer linked monitors? If not, why not?
- Will NRC require monitors to measure heat, helium (to provide early warning) and radiation sensitive monitors installed on each cask?

4. **Buildings:** Will NRC require a building around Pilgrim's ISFSI? If not, why not?

Argument for a building

- Leaks can be captured if the casks are in a building.
- A building provides additional protection against environmental and other external hazards. Premature cask degradation caused by moisture, at issue in Pilgrim's location could be prevented- lessons learned from Peach Bottom and Three Mile Island. Germany and Japan (at Fukushima) and other countries house casks in buildings.
- Cracks in casks: Stainless steel canisters: 304 and 316 stainless steel is susceptible to chloride stress corrosion cracking (SCC).A crack could result in significant offsite releases.
- There is no technology to inspect even the exterior of stainless steel canisters for cracks once they are loaded with fuel. (See: EPRI Extended Storage: Research Perspective presentation, John Kessler, EPRI Used Fuel and High-Level Waste Management Program, NWTRB Meeting, September 14, 2011 <http://www.nwtrb.gov/meetings/2011/sept/kessler.pdf> ; Chloride stress corrosion cracking in austenitic stainless steel – recommendations for assessing risk, structural integrity and NDE based on practical cases and a review of literature, UK July 2010, ES/MM/09/48, HSL Project JN0004220, R. Parrott BSc PhD MIMMM CEng, H. Pitts MEng PhD <http://www.hse.gov.uk/offshore/ageing/stainless-steels.pdf>)
- No U.S. steel canisters have been opened or removed from their concrete overpacks or even inspected on the exterior of the canisters. The conditions on and in actual canisters are unknown (See: EPRI 2012 slide: What we don't know... What are the conditions on actual canisters? <https://sanonofresafety.files.wordpress.com/2013/06/ml13022a316epri-2012-12-18ssc-slide5.jpg>)
- Due to concerns of gamma radiation and neutrons (which the steel containers don't block) and the possibility of damaging the canister, the NRC does not require the utilities to remove the stainless steel canisters from the concrete overpacks. Canister inspections present a number of challenges including lack of physical accessibility, dose considerations, lack of qualified and benchmarked techniques, and interpreting the significance of finding. (Stress Corrosion Cracking of Spent Nuclear Fuel Dry Storage Canister, Greg Oberson, Materials Engineer, NRC, Office of Nuclear Regulatory Research, Meeting with Fuel Cycle and Materials Administration, September 16-19, 2013 <http://pbadupws.nrc.gov/docs/ML1324/ML13241A391.pdf>)
- The NRC is allowing the nuclear industry five years to develop technology to adequately inspect the exterior of the steel canisters. (Chloride-Induced Stress Corrosion Cracking Tests and Example Aging

Management Program, Darrell S. Dunn, NRC/NMSS/SFST, Public Meeting with Nuclear Energy Institute on, Chloride Induced Stress Corrosion Cracking Regulatory Issue Resolution Protocol, August 5, 2014 <https://sanonofresafety.files.wordpress.com/2013/06/8-5-14-scc-rirp-nrc-presentation.pdf>

- The NRC’s proposed Aging Management Plan requires only one canister at each plant be inspected and only on the exterior surface. The first inspection would be at 25 years (allowing 5 years for inspection technology to be developed), then once every 5 years after that for the same canister.(Aging Management Program Example for Stress Corrosion Cracking, Darrell S. Dunn, Meeting to Obtain Stakeholder Input on Potential Changes to Guidance for Renewal of Spent Fuel Dry Cask Storage System Licenses and CoC, July 14, 2014 <http://pbadupws.nrc.gov/docs/ML1419/ML14192A702.pdf>)
- After the inspection technology is implemented, future new licenses would require an initial inspection within 20 years. The nuclear industry proposed an alternative “Toll-Gate Aging Management Plant (AMP)” requiring inspection of only one canister in the U.S. instead of one at each plant. And they propose licenses be renewed before inspecting any canisters.(Stakeholder Input on Potential Changes to Guidance for Renewal of Spent Fuel Dry Cask Storage System Licenses and CoC, NEI, Rod McCullum, July 14, 2014 <http://pbadupws.nrc.gov/docs/ML1419/ML14190B052.pdf>)

5. **Mitigation:** Will NRC commit to providing documentation to the public about how the dry storage system will be monitored, inspected, repaired and how fuel assemblies can be retrieved, transferred to another canister or cask, and prepared for transport before NRC gives the go-ahead for transfer to occur? If not, why not?

Again thank you for your work. How Entergy moves to dry cask storage raises many concerns – will it be done to best protect the public or to best protect Entergy’s bottom line? Entergy’s is in business to make money and not doing well in our market economy. Therefore we depend on NRC doing its job as a counter-weight.

Cheers,

Mary

1. **Timing: Will NRC inspect Entergy's plans for radiation monitoring BEFORE Entergy has moved forward with its plan?**

Otherwise the agency gets caught in a fait accompli that makes it unlikely that NRC would direct Entergy to change course and put something else in place that would better protect public health and safety.

The NRC intends to inspect Entergy's plans for environmental radiation monitoring of the Pilgrim Independent Spent Fuel Storage Installation (ISFSI) during upcoming inspection activities associated with the NRC observed dry runs. This will occur prior to the first loaded cask being placed on the ISFSI pad. If it is found that the licensee is not complying with the regulations, the NRC would address the issue in accordance with the NRC Enforcement Policy and would ensure that appropriate and timely corrective actions were taken to restore safety, security, and compliance with the regulations.

2. **TLD's: How can NRC justify approving TLDs to monitor Pilgrim's casks considering their deficiencies?**

Since November 1976, the NRC has provided guidance to licensees concerning the use of thermoluminescent dosimeters (aka TLDs) for environmental monitoring. Specifically, Regulatory Guide 4.13, "Performance Testing and Procedural Specifications for Thermoluminescence Dosimetry Environmental Applications" (ADAMS Accession Number: ML003739935), provides performance, testing, and procedural specifications on the use of TLDs in environmental applications. TLDs have been widely used at ISFSIs for environmental monitoring.

3. **Real-Time, Computer-Linked Monitors are readily available and relatively cheap. They enable the licensee, NRC and public to know what is going on immediately so mitigation can occur.**

- a. **Will NRC require real-time computer linked monitors? If not, why not?**

No. The Certificate of Compliance (CoC) for the HOLTEC HI-STORM 100 system does not require real time monitoring. The HI-STORM 100 system to be used at Pilgrim is designed as a passive air cooled system for outdoor use. The HI-STORM 100 System is autonomous inasmuch as it provides spent fuel assemblies and radioactive material confinement, radiation shielding, criticality control and passive heat removal independent of any other facility, structures, or components. The surveillance and maintenance required by the plant's staff is minimized by the HI-STORM 100 System since it is completely passive and is composed of materials with long proven histories in the nuclear industry.

- b. **Will NRC require monitors to measure heat, helium (to provide early warning) and radiation sensitive monitors installed on each cask?**

No. The canisters to be used at Pilgrim's are welded closed and therefore do not require the use of instrumentation to assure the safe storage of spent fuel. Prior to being placed on the ISFSI pad, the welds are examined and tested to confirm their integrity, and radiation measurements are taken. In accordance with the CoC for the HOLTEC HI-STORM 100 system, a surveillance of the passive heat removal system (air inlet and

outlet vents) is required daily to ensure system operability. This can be achieved by either monitoring the inlet and outlet vent temperatures or performing a visual inspection daily to ensure that the vents are not blocked. Pilgrim has elected to perform daily visual inspections to ensure the air inlet and outlet vents do not become blocked and the passive heat removal system remains operable.

4. Buildings: Will NRC require a building around Pilgrim's ISFSI? If not, why not?

No. The HI-STORM 100 system to be used at Pilgrim is designed as a passive air cooled system for outdoor use and not required to be housed in a building.

5. Mitigation: Will NRC commit to providing documentation to the public about how the dry storage system will be monitored, inspected, repaired and how fuel assemblies can be retrieved, transferred to another canister or cask, and prepared for transport before NRC gives the go-ahead for transfer to occur? If not, why not?

The Amendment 7 of the CoC for the HOLTEC HI-STORM 100 (ADAMS Accession Number: ML093620049) and its Final Safety Analysis Report (revision 9), (ADAMS Accession Number: ML101400161) contain the requirements and technical specifications for the dry cask system. The licensee is required to use and operate the system in accordance with these documents.