

August 30, 2012

MEMORANDUM TO: Doug Weaver, Deputy Director  
Licensing and Inspection Directorate  
Division of Spent Fuel Storage and Transportation, NMSS

FROM: Michael D. Waters, Branch Chief **/RA/**  
Licensing Branch  
Division of Spent Fuel Storage and Transportation, NMSS

SUBJECT: SUMMARY OF JANUARY 19, 2012, MEETING WITH  
ENERGYSOLUTIONS, PRE- SUBMITTAL MEETING FOR THE  
CERTIFICATE OF COMPLIANCE RENEWAL FOR THE VSC-24  
STORAGE SYSTEM (DOCKET NO. 72-1007)

### Background

EnergySolutions plans to submit an application to renew the general 10 CFR Part 72, Subpart K Certificate of Compliance (CoC) for the VSC-24 dry cask storage system (Docket No. 72-1007). The original CoC for the VSC-24 cask system expires on May 7, 2013. The renewal application will request an extension of the CoC for another 40 years (i.e., until May 7, 2053). The regulation, Energy – Title 10 of the *Code of Federal Regulations*, (10 CFR) 72.240 requires that the renewal application be submitted not less than thirty (30) days before the expiration date of the CoC.

The pre-submittal meeting with EnergySolutions, Entergy and NextEra was noticed on December 27, 2011. The Agency-wide Documents Access and Management System (ADAMS) accession number for the meeting notice is ML113630434. The meeting agenda is provided as Enclosure 1. The meeting attendance list is provided as Enclosure 2. Enclosure 3 is the handout from the public meeting.

The purpose of the pre-submittal meeting was to present EnergySolutions' planned approach and technical methods for performing the steps outlined in the NUREG-1927, "Standard Review Plan for Renewal of Spent Fuel Dry Cask Storage System Licenses and Certificates of Compliance", guidance document. These steps include performing the scoping evaluation, aging management review, time limited aging analyses, and developing an aging management program for the storage cask system. The intent of the meeting was to facilitate an open dialog between EnergySolutions and the NRC staff on the various technical and licensing issues, and to solicit NRC feedback on the proposed approaches for meeting various requirements.

### Discussion

EnergySolutions' presentation began with an overview description of the VSC-24 cask system and licensing history. The VSC-24 system employs a coated carbon steel canister, the Multi-assembly Sealed Basket (MSB) that is placed inside a Ventilated Concrete Cask (VCC). The VCC consists of reinforced concrete with a carbon steel inner liner and carbon steel inlet and outlet ducts. The MSB employs a double welded closure. The MSB interior basket also consists of (coated) carbon steel. No neutron absorber sheets are employed in the MSB

design. The VSC-24 is a storage-only system. The VSC-24 is not licensed for transportation. There are fifty-eight (58) VSC-24 casks at three nuclear plant sites (i.e., Arkansas Nuclear One, Palisades and Point Beach) all near bodies of fresh water. None of the environments constitutes a marine environment.

In the development of the CoC renewal application, *EnergySolutions* plan to follow the guidance given in the NUREG-1927 document. *EnergySolutions* discussed the specific elements of the scoping evaluation, aging management review (AMR), aging management program (AMP) and time limited aging analyses (TLAAs) that will be performed in support of the application. *EnergySolutions* discussed the proposed approach for performing the lead cask inspection. *EnergySolutions* then presented an estimated schedule for submitting the CoC renewal application and the subsequent review process.

The bulleted items listed below provide a summary of the discussions between the NRC and *EnergySolutions*.

- NRC staff asked if the VSC-24 system canister (MSB) was transportable, and if it is not, how the requirements of 10 CFR 72.236(m) would be met. *EnergySolutions* responded that the VSC-24 is a storage-only system, which is not licensed for transportation, and that unless other provisions are made, it will be necessary to remove the fuel from the MSBs after the storage period and repackage for transportation, if needed. *EnergySolutions* also stated that addressing fuel retrievability in the application should be sufficient to address any such final fuel disposition issues. It was also concluded that such transportation issues should not have any impact on a 10 CFR Part 72 CoC renewal application.
- NRC staff asked if air outlet temperature monitoring was being performed for the VSC-24 casks. *EnergySolutions* responded that the requirement for temperature monitoring was removed in Amendment No. 6 of the CoC, and that now only periodic visual inspections of the VCC inlet and outlet screens is required, although some General Licensees may still be collecting outlet temperature data. Such data may be used to perform a trending evaluation in support of the CoC renewal application.
- NRC staff asked if the MSB closure was monitored or tested for leakage, and how confinement could be assured for 40 more years. *EnergySolutions* stated that initial confinement performance is verified through the leak testing performed during initial loading, and that monitoring of the closure weld is not required for canister-based systems with a double closure weld (per ISG-5). *EnergySolutions* stated that the AMR evaluation will consider TLAA and aging management activities required to assure confinement for the extended storage period.
- NRC staff asked about the application of TLAAs and the AMP for a general license renewal. *EnergySolutions* stated that the CoC renewal will address the general license as well as those VSC-24 casks that are currently loaded.
- NRC staff asked about the amendment history of the VSC-24 CoC, what the various CoC amendments addressed, and whether this history was described in the FSAR. *EnergySolutions* responded that the FSAR did not contain a section that contained a running history of the CoC amendment content, but that we would be willing to provide this information in a future meeting or teleconference.

- NRC asked why the independent spent fuel storage installation (ISFSI) pad was not included as an in-scope structures, systems, and components (SSC). The ISFSI pad had been listed as an SSC in some of the site-specific license renewal applications. *EnergySolutions* responded that the ISFSI pad is specifically not included in the scope of the VSC-24 CoC. *EnergySolutions* noted that NUREG-1927 states that the ISFSI pad is generally not considered an in-scope SSC for a generic cask system license. Furthermore, the VSC-24 storage system ISFSI pad is classified as not important to safety.
- There was discussion as to whether fuel retrievability was a “safety function”. *EnergySolutions* stated that they believe that it is not a safety function, but rather a regulatory requirement that is assured by satisfying the safety functions of structural support, confinement, criticality control, and heat transfer.
- *EnergySolutions* discussed the TLAA that addresses leakage of the MSB helium over the extended storage period and explained that the effect on the MSB heat transfer would be less than the effect of the decay of heat load over the same period. The thermal acceptance criteria for the design basis heat load of 24 kW for the vacuum drying condition was also discussed. It was noted that the analysis for steady-state vacuum drying conditions predicted a peak fuel cladding temperature slightly higher than 400°C. NRC staff noted that the peak cladding temperature for this condition is allowed to exceed 400°C provided the maximum cladding stress does not exceed the limit.
- NRC staff asked about the possibility of an increased rate of helium leakage over time, and how that is addressed in the licensing and/or TLAA analyses. *EnergySolutions* responded that increased leakage of the MSB closure will not be credible, provided that it can be demonstrated through TLAA and/or AMPs that there is no significant degradation of the closure weld for the extended period of storage. *EnergySolutions* stated that the leakage rate modeled in the TLAA is based on the bounding initial normal-condition MSB-interior pressure and takes no credit for the fact that the (driving) pressure would decrease over time, due to decreasing temperatures inside the MSB.
- *EnergySolutions* explained how the original fuel clad temperature limits in the VSC-24 SAR were established using the diffusion controlled cavity growth (DCCG) methodology, which is based on a criterion of 0.5% probability of cladding failure over a period of 40 years. *EnergySolutions* went on to explain that the method used for the TLAA was to show that the clad temperature in a design-basis cask after 40 years of storage was so low (< 150 °C) that cladding creep is no longer significant.
- NRC staff asked why ASME Subsection NC criteria were applied for the MSB’s design instead of Subsection NB. *EnergySolutions* stated that the original CoC was granted on that basis, and that the issue need not be addressed in the scope of a CoC renewal application.
- NRC staff asked if the effects of radiation exposure (i.e., radiation embrittlement) on the cask system steel components had been evaluated for the extended period of storage. *EnergySolutions* responded that it is not including such a TLAA, since radiation exposure (or fluence) was not addressed or evaluated in the original license application, and NUREG-1927 states that new issues should not be raised in a license renewal application. NRC staff stated that an applicant could include additional information in the application if they so desire, and that a very brief evaluation (showing negligible fluence) should be sufficient.

- NRC staff asked about fatigue and crack growth for a period of 60 (vs. 20) years. *EnergySolutions* responded that such aging mechanisms will be considered in the TLAAs, as appropriate, and that all documentation (including evaluations performed in support of disposition of weld flaws or inspection results) will be reviewed for any references to finite time periods (e.g., 20 years).
- NRC stated that the CoC renewal application should identify the codes and standards (e.g., ACI standards) that will be applicable to the lead cask inspection. *EnergySolutions* concurred with that suggestion.
- NRC staff asked about how potential degradation of the RX-277 neutron shielding in the MSB lid would be addressed, and if routine dose rate measurements on the cask top were taken. A licensee representative stated that the top lid neutron dose rate is not routinely measured, but that measurements have been taken at the time of cask loading. *EnergySolutions* stated that the VSC-24 licensing evaluations are based on “dry” RX-277 with all the un-bound water removed, and that the RX-277 is baked to remove excess moisture before being placed inside the MSB lid. For these reasons, it is considered unlikely that RX-277 with a hydrogen density lower than the conservative value modeled in the licensing evaluations would occur.
- NRC staff asked if the VCC cover plates (i.e., weather covers) were routinely inspected for leakage. *EnergySolutions* responded that they are not, but that video surveillance taken during the 5-year cask inspections at each site did not show any evidence of water leakage into the cask. It was also discussed that the plan for the lead cask inspection included removal of the VCC cover plate and that any potential leakage of the weather cover would be detectable at that time.
- *EnergySolutions* discussed the criteria that will be used for selecting casks for the lead cask inspection. NRC staff stated that maximum heat load casks have often been selected. *EnergySolutions* stated that they were considering selecting a maximum heat load cask, given that the oldest casks in the ISFSIs are already subject to the 5-year inspections. *EnergySolutions* also pointed out that there is not a wide variation in the heat loads and ages for the casks, with most casks having heat loads of 9-14 kW (well below the 24 kW design basis) and an age of 15 years for the hottest cask, versus 20 years for the oldest cask.
- *EnergySolutions* stated that they were considering performing the lead cask inspection on a single cask, given the similarity in heat loads and ages between the casks, and the environmental similarities between the three VSC-24 ISFSI sites.
- *EnergySolutions* pointed out that the final draft of NUREG-1927 does not require that the canister (MSB) or concrete cask be lifted to allow inspections of the cask bottom, MSB bottom and ISFSI pad under the cask. Therefore, *EnergySolutions* is considering not calling for those lifts to be performed as part of the lead cask inspection. NRC staff discussed the potential need for such inspections, including the ISFSI pad and concrete cask bottom.
- The staff conveyed to *EnergySolutions* that the proposed review schedule appeared to be aggressive and may not be realistic in light of the request being the first CoC renewal. NRC Office Instruction No. 14 “Acceptance Review Process” was given to *EnergySolutions* to get

a better idea of expected review times for the acceptance review. Staff also discussed whether direct-final rulemaking applies to a CoC renewal.

- *EnergySolutions* stated that the VSC-24 CoC renewal application is expected to be filed in May of 2012. *EnergySolutions* also stated that the lead cask inspection is expected to occur sometime in the summer of 2012 (i.e., after the license renewal application is submitted). This prompted discussion about whether submitting the CoC renewal application before the inspection would be useful. The possibility of performing the inspection in parallel with the NRC's acceptance review was discussed. The staff also suggested *EnergySolutions* perform the lead cask inspection prior to submitting the CoC renewal application.
- NRC staff asked whether changes made to the VSC-24 storage system under the provisions of 10 CFR 72.48 would be identified in CoC renewal application. *EnergySolutions* responded that there have been no changes made to the VSC-24 storage system under the provisions of 10 CFR 72.48 since the last amendment to the CoC (i.e., Amendment No. 6) and therefore no new changes made under 10 CFR 72.48 would be included in the CoC renewal. NRC staff suggested that changes made under 10 CFR 72.48 that had not been reviewed by NRC staff may need to be reviewed. Further discussion concluded that this was not required by the Regulations. NRC staff asked if changes made under 10 CFR 72.48 were identified as such in the previous revision of the FSAR. *EnergySolutions* replied that this information had been provided in the Revision Description with each FSAR update.
- NRC suggested that *EnergySolutions* send electronic copies of documents that support the CoC renewal application at the time of submittal in order to facilitate the NRC review. *EnergySolutions* agreed to this request.

NRC staff made no regulatory commitments at the meeting. This meeting summary closes TAC No. L24613.

Docket No. 72-1007

TAC No. L24613

Enclosures:

1. Meeting Agenda
2. List of Meeting Attendees
3. Presentation Slides

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Distribution: SFST r/f NRC Attendees

G:\SFST\Energy Solutions\Meeting Summary.docx **ADAMS Package No.: ML120690506**

<b>OFC</b>	SFST	E	SFST		SFST	
<b>NAME</b>	PLongmire		WWheatley/DDamiano		MWaters	
<b>DATE</b>	3/2/2012		3/9/2012		8/30/2012	

C=Without attachment/enclosure E=With attachment/enclosure N=No copy

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**AGENDA**  
**January 19, 2012, 1:00 p.m. – 4:00 p.m.**

**EnergySolutions, Entergy and NextEra Meeting with NRC  
Certificate of Compliance No. 72-1007 (VSC-24) Renewal  
Pre-Application Submittal Meeting**

Introductions/Purpose of Meeting  
Background  
Application Content  
Scoping Evaluation  
Aging Management Review (AMR)  
Aging Management Program (AMP)  
Time-Limited Aging Analyses (TLAA)  
Lead Cask Inspection  
Schedule  
Summary  
Discussion/Questions  
Adjourn



**Meeting Between EnergySolutions, Entergy and NextEra  
and the Nuclear Regulatory Commission**

**January 19, 2012**

**Meeting Attendees (and Affiliation)**

Longmire, Pamela	NRC/NMSS/SFST
Weaver, Doug	NRC/NMSS/SFST
Pstrak, David	NRC/NMSS/SFST
Sampson, Michele	NRC/NMSS/SFST
Temps, Rob	NRC/NMSS/SFST
Tang, David	NRC/NMSS/SFST
Gordon, Matthew	NRC/NMSS/SFST
DePaula, Sara	NRC/NMSS/SFST
Sotomayor, Alexis	NRC/NMSS/SFST
Huang, Daniel	NRC/NMSS/SFST
Chang, Jimmy	NRC/NMSS/SFST
Li, Zhian	NRC/NMSS/SFST
Banovac, Kristina	NRC/NMSS/SFST
Hopf, James E.	EnergySolutions
Sisley, Steven	EnergySolutions
Leblang, Suzanne	Entergy
Clark, Bob	ANO
Shaw, Don	TransNuclear, Inc.
Weimer, Nicola	TransNuclear, Inc.
Venigalla, Venkata	TransNuclear, Inc.

**Participation by phone**

Learn, Matthew	NRC/R-III
Manrique, Miguel	TransNuclear, Inc.
Greene, Carlyn	UxConsulting
Conley, Maureen	Platts/McGraw-Hill Nuclear Publications