



Exelon Generation®

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ATTN: Document Control Desk
Director, Spent Fuel Project Office
Office of Nuclear Material Safety and Safeguards
U. S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Peach Bottom Atomic Power Station (PBAPS), Units 2 and 3
Renewed Facility Operating License Nos. DPR-44 and DPR-56
NRC Docket Nos. 50-277, 50-278 and 72-29 (ISFSI)

Subject: Submittal of Independent Spent Fuel Storage Installation (ISFSI) Cask Event Report

In accordance with ISFSI TN-68 Certificate of Compliance (CoC) Amendment 0 Technical Specifications Section 2.2.2, this report provides follow-up information regarding a 24-hour notification to the NRC on 1/25/13 (EN # 48698) concerning a non-compliance with cask Technical Specification limits. Four casks were loaded with fuel which had been cooled for 9.8 years instead of the required period of 10 years.

Abstract:

A recent review of historical ISFSI fuel characterization data found that in the 2001 ISFSI loading campaign, a total of four Unit 3 fuel assemblies were loaded into four dry storage casks (i.e., one assembly per cask) having been cooled for 9.8 years, with a decay heat value of 0.201 kW each, which is well below the 0.312 kW limit (TN-68 TS 2.1.1.). It has been determined that there were no actual thermal related concerns with the fuel or the associated cask components. However, this was contrary to the Functional and Operational limits of TS Section 2.1.1, Table 2.1.1-1, which requires the assemblies to have been cooled for 10 years. The decay heat of the assemblies has continued to decrease since their initial loading in 2001 and all assemblies currently meet the TS 2.2.1 limits. The fuel assemblies are in a safe condition as required by TS 2.2.1. There were no adverse impacts to the ability of the affected ISFSI casks to store fuel assemblies in a safe condition.

These casks were loaded under Transnuclear TN-68 CoC Amendment 0 (Certificate 1027). This notification is required pursuant to TN-68 TS Section 2.2.2. This issue has been entered into the Corrective Action Program.

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ISFSI Cask Operating Conditions and Status Prior to the Event:

The adverse condition was identified on 1/24/13 during a review of ISFSI fuel characterization data. All related structures, components and systems were operable at the time of discovery.

Description of the Event:

A recent review of historical ISFSI fuel characterization data found that in the ISFSI 2001 campaign, a total of four Unit 3 fuel assemblies were loaded into four dry cask storage casks (one assembly per cask) which had been cooled for 9.8 years, compared with the required cooling time of 10 years. The fuel assemblies had a decay heat value of 0.201 kW each, which is well below the 0.312 kW limit (TN-68 TS 2.1.1.). It has been determined that there were no actual thermal related concerns with the fuel or the associated cask components. However, this was contrary to the Functional and Operational limits of TS Section 2.1.1, Table 2.1.1-1, which requires the assemblies to have been cooled for 10 years. The decay heat of the assemblies has continued to decrease since their initial loading in 2001 and all assemblies currently meet the TS 2.2.1 limits. The fuel assemblies are in a safe condition as required by TS 2.2.1.

These casks were loaded under Transnuclear TN-68 CoC Amendment 0 (Certificate 1027). This notification is required pursuant to TN-68 TS Section 2.2.2. This issue has been entered into the Corrective Action Program.

Analysis of the Event:

A review of ISFSI fuel characterization data has determined that four Unit 3 fuel assemblies loaded in the June 2001 ISFSI campaign under TN-68 CoC Amendment 0 had cooling times of 9.8 years, vs. the 10 year cooling time requirement given in TN-68 TS Table 2.1.1-1. Specifically, the bundles are:

LJW874 - Loaded in ISFSI Cask TN-68-05 on 6/19/01, GE6 8x8, uranium content is 0.182 MTU, minimum initial bundle average enrichment of 2.99%, assembly maximum burnup of 29.582 GWd/MTU, discharged date was 9/14/91.

LJW875 - Loaded in ISFSI Cask TN-68-06 on 6/26/01, GE6 8x8, uranium content is 0.182 MTU, minimum initial bundle average enrichment of 2.99%, assembly maximum burnup of 29.577 GWd/MTU, discharged date was 9/14/91.

LJW882 - Loaded in ISFSI Cask TN-68-07 on 7/10/01, GE6 8x8, uranium content is 0.182 MTU, minimum initial bundle average enrichment of 2.99%, assembly maximum burnup of 29.578 GWd/MTU, discharged date was 9/14/91.

LJW867 - Loaded in ISFSI Cask TN-68-08 on 7/17/01, GE6 8x8, uranium content is 0.182 MTU, minimum initial bundle average enrichment of 2.99%, assembly maximum burnup of 29.580 GWd/MTU, discharged date was 9/14/91.

Based on the above burnups and enrichments, the minimum required cooling time for these bundles is 10 years, per TN-68 TS Table 2.1.1-1. This cooling time ensures that the maximum heat load per assembly does not exceed 0.312 kW (TN-68 TS 2.1.1.E.ii).

Actual decay heat values for these fuel assemblies were calculated using Regulatory Guide 3.54. The actual decay heat value for each of the four fuel assemblies was 0.201 kW, which is well below the 0.312 kW limit given in TN-68 TS 2.1.1.E.ii, so the ISFSI cask decay heat limit was met at all times.

The subject four fuel assemblies came into compliance with the TN-68 TS Table 2.1.1-1 when they achieved their 10 year cooldown time on 9/14/01.

Cause of the Event:

The cause of this event was a failure of the ISFSI Fuel Selector and Verifier to perform adequate verification of fuel history operating records when characterizing these fuel assemblies for ISFSI cask storage. Incomplete operating cycle history information was used for these 4 fuel assemblies. A contributing cause was that the procedural guidance in place at the time was not robust enough to ensure all characterization requirements were verified to be met.

At the time of this event (2001), characterization of fuel assemblies for ISFSI fuel storage was performed IAW SF-300, "TN-68 Cask Spent Fuel Assemblies Storage Selection and Document Requirements". This procedure specified the responsibilities of the ISFSI Fuel Selector and the ISFSI Fuel Selection Verifier, as well as the spent fuel characterization parameters required for TN-68 Dry Cask Storage and Disposal. Each of the 4 fuel assemblies were operated for a 4th operating cycle that was not accounted for during the fuel characterization process. For these four fuel assemblies, the additional cycle of operation resulted in an actual discharge date of 9/14/91 instead of the erroneous date of 3/31/87 originally used in the fuel characterization.

Per SF-300, the ISFSI Fuel Selector is responsible to ensure the fuel assemblies placed in TN-68 casks "meets the requirements of this procedure". The various parameters were listed, along with source document references. The various databases used were not controlled or validated at the time of this event, and the 4th operating cycle history was missed for the four fuel assemblies.

The ISFSI Fuel Selection Verifier "verifies that fuel meets the requirements of this procedure", per SF-300. No detailed guidance of how to perform this review was provided, and no independent verification or independent third party review was required of the ISFSI fuel characterization data.

Corrective Actions:

In 2011, procedure SF-300 was superseded by Exelon corporate procedure NF-AB-623, "BWR Fuel Selection and Documentation for Transnuclear TN-68 Dry Cask Loading." Implementation of this procedure at Peach Bottom resulted in many improvements to the ISFSI fuel characterization process, including:

- A dedicated contractor (Transware) that does this work for all Exelon ISFSI sites.
- The ISFSI loadings are generated with controlled software (CASKLOADER) and controlled databases.
- Each ISFSI cask loading and database update is processed as a CC-AA-309 Design Analysis / Calculation

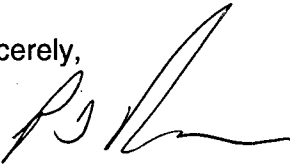
- Prior to each ISFSI campaign, there is a formal technical human performance brief for the fuel characterization process, which covers risk factor, consequences, and applicable operating experience.

A review of all fuel assemblies currently stored in ISFSI casks was performed and no additional assemblies were identified that did not meet the 10 year TS cooling time requirement. The more robust process for ISFSI fuel selection greatly reduces the chance of a similar event occurring in the future.

A TS exemption request will be submitted within 90 days from the date of this report to allow for continued storage of the affected fuel assemblies in their associated storage casks.

Additional information concerning spent fuel storage under this license may be obtained by contacting Dan Dullum, at 717-456-3339.

Sincerely,



Patrick Navin
Plant Manager, Peach Bottom Atomic Power Station
Exelon Generation Company, LLC

cc: US NRC, Administrator, Region 1
US NRC, Senior Resident Inspector

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