

U.S. NUCLEAR REGULATORY COMMISSION
REGION I

INSPECTION REPORT

Inspection No. 07200048/2011001

Docket No. 07200048

License No. DPR-70, DPR-75, NPF-57

Licensee: PSEG Nuclear LLC
Hope Creek Generating Station
Salem Nuclear Generating Station

Location: Hancocks Bridge, NJ

Inspection Dates: November 10, 2011 – June 1, 2012

Inspectors: Stephen Hammann, Senior Health Physicist
Decommissioning Branch
Division of Nuclear Materials Safety

Jorge Solis, Senior Thermal Engineer
Thermal & Containment Branch
Division of Spent Fuel Storage and Transportation

Approved By: Marc S. Ferdas, Chief
Decommissioning Branch
Division of Nuclear Materials Safety

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EXECUTIVE SUMMARY

NRC Inspection Report No. 07200048/2011001

The inspectors reviewed PSEG Nuclear LLC's (PSEG's) activities associated with the use of an incorrect method for calculating the heat load ($Q_{(CoC)}$) for 13 loaded spent fuel casks. The condition was documented in PSEG's corrective action program in notifications 20530707, 20532615, and 20532467. The inspectors interviewed PSEG and Holtec International (Holtec) personnel and reviewed PSEG and Holtec documents and procedures. The inspectors also reviewed PSEG's apparent cause evaluation report and corrective actions.

Based on the results of this inspection, a Severity Level (SL) IV Non-Cited Violation (NCV) of Condition 2 of Certificate of Compliance (CoC) 1014, Amendment 5, was identified. PSEG's procedures SC.MD-FR.DCS-0002(Q), "Dry Cask Storage Fuel Selection for Cask Loading" and HC.MD-FR.DCS-0002(Q), "Dry Cask Storage Fuel Selection for Cask Loading" were not consistent with the technical basis described in Chapter 8 of the HI-STORM Final Safety Analysis Report (FSAR) because they did not contain the correct methodology to calculate the cask $Q_{(CoC)}$. As a result, in 2010 and 2011, the $Q_{(CoC)}$ was incorrectly calculated for casks loaded at Salem (93, 94, 95, 96, 128, 129, 130, 131, and 132) and Hope Creek (155, 156, 157, and 158); which, then caused the casks to be backfilled with less helium than specified in the technical specifications. Because this violation was of very low safety significance and it was entered into PSEG's corrective action program, this violation is being treated as a NCV, consistent with the NRC Enforcement Policy. The inspectors determined that this violation did not involve a Reactor Oversight Process (ROP) finding, therefore no cross-cutting issue was assigned.

I. REPORT DETAILS

Background

The Holtec HI-STORM 100 Cask System CoC 1014, Amendment 5, was issued in July 2008. The amendment included a new regionalized fuel loading scheme to allow higher decay heat loads for casks. On August 21, 2008, Holtec submitted FSAR Revision 7 for the HI-STORM 100 Cask System, which included all changes to the cask design or procedures approved through CoC Amendment 5. Revision 7 of the HI-STORM FSAR provided the methodology for calculating the heat load for regionalized fuel loadings.

The CoC 1014, Amendment 5 Condition 2, states that written operating procedures shall be prepared for cask handling, loading, movement, surveillance, and maintenance. It further states that the user's site-specific written operating procedures shall be consistent with the technical basis described in Chapter 8 of the FSAR. Chapter 8 of the FSAR states, in part, to "...backfill the MPC in accordance with the technical specifications."

On October 24, 2011, Holtec issued an information bulletin informing its users that the method for calculating total cask heat load, $Q_{(CoC)}$, was not being performed in accordance with FSAR, Revision 7 Subsection 2.1.9 by some users. It further stated that if loading to CoC Amendment 5 or above, users should confirm that the aggregate heat load complies with the CoC and that users must determine that the total heat load is in accordance with FSAR requirements in Section 2.1.9.

a. Inspection Scope (Inspection Procedure (IP) 60855)

The inspectors reviewed PSEG's activities associated with the use of the incorrect methodology for calculating the heat load for 13 loaded spent fuel casks. The condition was documented in PSEG's corrective actions program in notifications 20530707, 20532615, and 20532467. The inspectors interviewed PSEG and Holtec personnel and reviewed PSEG and Holtec documents and procedures. The inspectors also reviewed PSEG's apparent cause evaluation report (70130358) and corrective actions.

b. Observations and Findings

After receiving the information bulletin from Holtec, PSEG reviewed their records from previous ISFSI campaigns to determine if they had used the incorrect method for calculating total cask decay heat load on any of their loaded casks. PSEG determined that the incorrect calculation method was used and 13 casks (Salem: 93, 94, 95, 96, 128, 129, 130, 131, and 132; Hope Creek: 155, 156, 157, and 158) loaded between 2010 and 2011 were potentially impacted. PSEG documented this condition in corrective action program notifications 20530707, 20532615, and 20532467.

PSEG performed technical evaluations and recalculated the total cask decay heat for the 13 casks identified in PSEG's corrective action program notifications in accordance with Holtec FSAR, Revision 7. PSEG determined that the 13 casks had a greater heat load than previously thought such that they would have required to have been backfilled with a larger amount of helium than they received in order to be in compliance with Technical Specifications (TS) 3.1.1.

In accordance with the TS action requirements, PSEG, with assistance from Holtec, performed an evaluation to determine how much helium was in the casks and performed an analysis to demonstrate all FSAR limits for cask components and contents were met.

PSEG initiated an investigation to determine the apparent cause, extent of condition, and corrective actions. The results of the investigation were documented in an apparent cause evaluation report. PSEG determined that they had not incorporated the new method for calculating total cask decay heat load contained in HI-STORM FSAR Revision 7 into their station procedures. As a result, the incorrect decay heat load was calculated and resulted in casks being backfilled with the incorrect quantity of helium. PSEG's corrective actions included revising procedures HC.RE-FR-DCS-002(Q), and SC.RE-FR-DCS-002(Q), and assigning responsibility for reviewing and implementing new CoC amendments within the engineering department.

c. Conclusions

Based on the results of this inspection, a SL IV NCV of Condition 2 of CoC 1014, Amendment 5, was identified. Condition 2 of CoC 1014, Amendment 5 states that written operating procedures shall be prepared for cask handling, loading, movement, surveillance, and maintenance; and that user's site-specific written operating procedures shall be consistent with the technical basis described in Chapter 8 of the FSAR. Contrary to the requirement, PSEG's site-specific written operating procedures were not consistent with the technical basis described in Chapter 8 of the HI-STORM FSAR. Chapter 8, Section 8.1.5 "MPC Closure", step 6.n. states "...backfill the MPC in accordance with the technical specifications". PSEG's procedures SC.MD-FR.DCS-0002(Q), and HC.MD-FR.DCS-0002(Q), were not consistent with the technical basis because they did not contain the correct methodology to calculate the cask $Q_{(CoC)}$. As a result, in 2010 and 2011, the $Q_{(CoC)}$ was incorrectly calculated for casks loaded at Salem (93, 94, 95, 96, 128, 129, 130, 131, and 132) and Hope Creek (155, 156, 157, and 158); which then caused the casks to be backfilled with less helium than specified in the technical specifications.

Because this violation was of very low safety significance and it was entered into the licensee's corrective action program, this violation is being treated as an NCV, consistent with the NRC Enforcement Policy. The inspectors determined that this violation did not involve a ROP finding, therefore no cross-cutting issue was assigned. **(NCV 07200048/2011001-01; PSEG Procedures Did Not Contain Correct Methodology For Calculation Of Total Cask Decay Heat Load)**

Exit Meeting

The inspection results were discussed with John Perry, Hope Creek Site Vice President, and members of his staff on June 1, 2012, at the conclusion of the inspection activities.

SUPPLEMENTAL INFORMATION

PARTIAL LIST OF PERSONS CONTACTED

Licensee

Steve Baker - Nuclear Fuels Contractor
Paul Bonnett - Senior Compliance Engineer - Hope Creek
Philip Duca - Senior Compliance Engineer - Hope Creek
Paul Duke - Licensing Manager
Mike Gaffney - Hope Creek Regulatory Assurance Manager
Brian Gustems - Manager - Fuel Supply and Technical Support
Brian Gutherman, P.E. President -Gutherman Technical Services, LLC
Evrin Kalfazade, Holtec International, Adjunct Program Manager
David Lefleur - Compliance Engineer - Salem
Peter Macconi - Outage Services - DCS Task Manager
Debabrata Mitra-Majumdar, Holtec International, Program Manager
John Perry - Hope Creek Site Vice President
Glenn Schwartz - PSEG Nuc Fuels, Fuel Performance Program Engineer

INSPECTION PROCEDURES USED

60855 – Operation of an Independent Spent Fuel Storage Installation

ITEMS OPEN, CLOSED, AND DISCUSSED

Open/Closed

07200048-2011-01 NCV PSEG Procedures Did Not Contain Correct Methodology For
Calculation Of Total Cask Decay Heat Load

LIST OF DOCUMENTS REVIEWED

Apparent Cause Evaluation Report, Dry Cask Storage (DCS) Heat Load Calculation and Helium
Backfill Issue (70130358)

CAP Notifications 20530707, 20532615, 20532467

Document Order 80105605 – Op. 0010, Determination of Operability Constraints Associated
with CoC Condition 9 Special Requirements not Completed

HC.MD-FR.DCS-0002(Q), Dry Cask Storage Fuel Selection for Cask Loading

Holtec International Letter, Engineering Evaluation for Salem MPC-32 SNs 095, 129, and 130

Holtec International Response to Request for Technical Information - 1332-001R0

Holtec International Response to Request for Technical Information -1626-002R1

SC.MD-FR.DCS-0002(Q), Dry Cask Storage Fuel Selection for Cask Loading

Tech Evaluation 80105180-0010, Use of Incorrect Method for Calculating Total Cask Decay Heat Load

Tech Evaluation 80105180-0020, LCO 3.1.1 Condition C, Action C.1

Tech Evaluation 80105180-0030, Review of Holtec RRTI-1626-022, Rev. 1

Tech Evaluation 80105180-0040, LCO 3.1.1 Condition C, Action C.1

Tech Evaluation 80105180-0050, Differential (27 Hour LCO) for Hope Creek MPC's 155, 156, 157 and 158

Tech Evaluation 80105180-0060, Review of Holtec RRTI-1332-00, Rev. 0

LIST OF ACRONYMS USED

CoC	Certificate of Compliance
FSAR	Final Safety Analysis Report
Holtec	Holtec International
IP	Inspection Procedure
ISFSI	Independent Spent Fuel Storage Installation
NCV	Non-Cited Violation
PSEG	PSEG Nuclear LLC
ROP	Reactor Oversight Process
SFST	Spent Fuel Storage and Transportation
SL	Severity Level
TS	Technical Specifications