UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
475 ALLENDALE ROAD
KING OF PRUSSIA, PA 19406-1415

December 3, 2008

Mr. Gene St. Pierre
Site Vice President
FPL Energy Seabrook, LLC
Seabrook Station
c/o Mr. James M. Peschel
P.O. Box 300
Seabrook, New Hampshire 03874

SUBJECT: SEABROOK STATION, UNIT NO. 1 - NRC INDEPENDENT SPENT FUEL STORAGE INSTALLATION (ISFSI) INSPECTION REPORT 05000443/2008006 AND 07200063/2008001

Dear Mr. St. Pierre,

This refers to the inspection conducted between July 7, 2008, and October 22, 2008, at the Seabrook Station. This inspection involved a review of the pre-operational demonstration and initial loading of spent fuel into the ISFSI facility. The inspection included field observations, examination of procedures and documents, and interviews with personnel. The inspection findings were discussed with members of the Seabrook staff during a preliminary exit meeting on September 15, 2008, and with Mr. Michael O'Keefe and other members of your staff during a final telephone exit meeting on October 22, 2008. The enclosed report presents the results of the inspection.

Based on the results of this inspection, the NRC has determined that a Severity Level IV violation of NRC requirements occurred. This violation is being treated as a Non-Cited Violation (NCV) consistent with Section VI.A of the Enforcement Policy. The NCV is described in the subject inspection report. If you contest the NCV in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the United States Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, D.C. 20555-0001, with copies to the Regional Administrator, Region I; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, D.C. 20555-0001; and the NRC Resident Inspector at the Seabrook Station.

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Sincerely,

/RA/

Raymond Lorson, Chief
Decommissioning Branch
Division of Nuclear Materials Safety

Docket Nos.: 50-443 and 72-063
License No.: NPF-86

Enclosure: Inspection Report 05000443/2008006 and 07200063/2008001
w/ Attachment: Supplemental Information

cc w/encl:
J. Stall, Executive Vice President, Nuclear and Chief Nuclear Officer
M. Nazar, Senior Vice President and Nuclear Chief Operating Officer
A. Khanpour, Vice President, Engineering Support
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T. Crimmins, Polestar Applied Technology
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Board of Selectmen, Town of Amesbury
S. Comley, Executive Director, We the People of the United States
R. Shadis, New England Coalition Staff
M. Metcalf, Seacoast Anti-Pollution League

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U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Docket Nos.:	50-443 and 72-063
License No.:	NPF-86
Report No:	05000443/2008006 and 07200063/2008001
Licensee:	FPL Energy Seabrook, LLC (FPL)
Facility:	Seabrook Station, Unit 1
Location	Seabrook, New Hampshire 03874
Dates:	July 7 through September 4, 2008 (on-site inspection activities), October 22, 2008 (completion date for in-office review of additional information provided by the licensee)

Team Leader:	Robert Carrion	Senior Reactor Inspector, Region II
Inspectors:	Vincent Everett	Senior Health Physics Inspector, Region IV
	Robert Temps	Senior Safety Inspector, Office of Nuclear Materials Safety and Safeguards (NMSS)
	Earl Love	Safety Inspector, NMSS
	James Schmidt	Health Physics Inspector, Region I
	Harold Gray	Senior Reactor Inspector, Region I
	JoAnn Ireland	Thermal Engineer, NMSS
	Zhian Li	Senior Criticality/Shielding Engineer, NMSS
	Bryce Lehman	General Engineer, NMSS

Approved By: Raymond Lorson, Chief
Decommissioning Branch
Division of Nuclear Materials Safety

Enclosure

EXECUTIVE SUMMARY

IR 05000443/2008006 and 07200063/2008001; 07/07/2008 – 10/22/2008; Seabrook Station; spent fuel pre-loading demonstration and initial loading.

This report covered an on-site inspection and in-office review by regional and headquarters based inspectors of activities related to the dry cask storage of spent fuel, including the preparation for, and the initial loading of, spent fuel into the independent spent fuel storage installation (ISFSI). FPL Energy Seabrook, LLC (Seabrook) had selected the NUHOMS-HD Horizontal Modular Storage System for dry storage of spent nuclear fuel at the Seabrook Station. The Nuclear Regulatory Commission (NRC) had certified the NUHOMS-HD cask system for storage of irradiated fuel under Certificate of Compliance (CoC) 72-1030 on January 10, 2007. The inspectors reviewed the pre-operational loading activities to confirm that the personnel, equipment, and station programs and procedures were adequate to safely load spent fuel into the ISFSI. The inspectors also observed selected portions of the initial spent fuel processing and transfer to the ISFSI to confirm that these activities were performed in accordance with the approved procedures, the CoC, and Technical Specification requirements.

Summary of Findings

A. NRC Identified and Self-Revealing Findings

The NRC identified a violation of Condition 8.b of the CoC for not performing a fully effective pre-operational demonstration of the welding of the inner top cover of the dry shielded canister (DSC). Specifically, the equipment configuration during the initial processing of spent fuel included a shield bell that was not installed during the pre-operational demonstration. In addition, significant differences in the personnel used to complete the welding activities were observed between the pre-operational demonstration and the initial spent fuel processing activities. This led to a delay in completing the processing of the initial DSC. The finding was determined to be a Severity Level IV violation consistent with Supplement I.D.3 of the NRC's Enforcement Policy. However, the finding was dispositioned as a Non-cited Violation (NCV), consistent with Section VI.A.1 of the NRC's Enforcement Policy.

B. Licensee-Identified Violations

None.

Report Details

.1 Preparation for and Initial Loading of Spent Fuel in the Independent Spent Fuel Storage Installation (ISFSI)

a. Inspection Scope (Inspection Procedures (IPs) 60854, 60855, 60856, and 60857)

A team of NRC inspectors reviewed licensee actions and performed evaluations to confirm that: station personnel had been properly trained, associated handling equipment had been tested, and procedures had been developed to safely load spent fuel into dry storage at the ISFSI; Seabrook Station programs and procedures were adequate for continued maintenance and operation of the ISFSI once it was loaded; the spent fuel cask crane was able to safely support and move a loaded transfer cask; and, the initial spent fuel loading activities were performed safely and in accordance with applicable requirements.

b. Observations and Findings

General Observations

The following summarizes the inspection observations in each of the specific areas reviewed.

Spent Fuel Building Crane

The licensee upgraded the fuel storage building crane to a single-failure proof design rated at 125 tons. This required replacement of the original trolley and also structural modifications to the fuel storage building. The licensee analyzed the new crane against the criteria contained in NUREG 0554, "Single-Failure Proof Cranes for Nuclear Power Plants," and performed a safety evaluation in accordance with 10 CFR 50.59. The inspectors reviewed selected crane design features and determined that the fuel storage building crane met the single-failure proof criteria. Also, the inspectors reviewed specification and test data for the fuel storage building crane wire rope and determined that it met the NUREG 0554 criteria that the maximum critical load should not exceed 10% of the manufacturer's published breaking strength.

The inspectors reviewed selected inspection and maintenance activities and observed that the licensee had incorporated the applicable requirements into site procedures. The procedures adequately incorporated annual inspections and tests of components such as brakes and limit switches, control systems, hooks and the wire ropes.

The licensee performed a 125% load test of the new crane to qualify the crane for a rated load of 125 tons. The crane was designed for 130 tons. The load test was performed using 167 tons, which exceeded the 156 tons needed to satisfy

the 125% load test requirement. The inspectors reviewed the calculated maximum weight of a loaded canister. The maximum weight of 124 tons, that would occur upon removal of the loaded canister from the spent fuel pool, was less that the rated load of the crane. The inspectors reviewed test documentation for the 300% load test of the yoke and of the transfer cask trunnions.

Canister Drying and Helium Backfill Operations

During the initial processing activities, the inspectors determined that the DSC was vacuum dried and backfilled with helium to the pressures specified by Technical Specifications. The drying and backfilling operations were completed within the required time limits.

Emergency Planning

The emergency plan had been revised to include potential events associated with the operation of the ISFSI. Emergency Action Levels (EALs) had been developed for postulated accidents involving the ISFSI.

Fire Protection

The fire protection plan had been expanded to include the ISFSI; emergency response training had been provided for on-site personnel and off-site responders.

Fuel Selection and Verification

The spent fuel assemblies selected for loading into the first NUHOMS-HD canister met the Technical Specification requirements for assembly type, cladding integrity, decay heat load, and physical design characteristics. The licensee developed a canister loading plan based on the combination of spent fuel assembly enrichment, burnup, cooling time, and decay heat. The inspector confirmed that the Technical Specification-required actions for incorrectly loaded spent fuel had been incorporated into the loading procedure.

General License Conditions

The NUHOMS-HD cask design was compatible with the Seabrook Station 10 CFR 50 requirements. The inspectors did not identify any items that required NRC review or approval prior to use of the NUHOMS-HD system. The NUHOMS-HD cask system design parameters were bounded by the Seabrook Station site parameters. In addition, the licensee demonstrated that the calculated dose to the public at the site boundary from normal ISFSI operations met the 10 CFR 72.104 requirements.

The Seabrook ISFSI pad is placed on a bedrock foundation, therefore, soil-structure interaction and soil liquefaction site-specific analyses were not required. The inspectors confirmed that the Horizontal Storage Modules (HSMs)

were placed onto the ISFSI pad in an array that was consistent with the Technical Specification requirements.

The engineering evaluations for the fire/explosion hazards analyses were detailed and used a systematic approach to evaluate all potential fixed and transient fire/explosion hazards. Conservative and appropriate assumptions involving administrative controls were placed in the applicable ISFSI operating procedures.

Procedures and Technical Specifications

Procedures were established to ensure that the NUHOMS-HD cask storage system Technical Specification requirements for inspection, maintenance, operation, and surveillance were implemented. The inspectors observed that these procedures were implemented during the initial NUHOMS cask system loading activities. The licensee established measures to ensure that the 10 CFR 72.212 Report, Certificate of Compliance, and related documents were maintained as long as spent fuel was stored at the ISFSI.

The licensee made the required 90-day notification to the NRC prior to loading of the first cask and had established procedural requirements to register each cask with the NRC within 30 days after loading. The licensee integrated transfer of the special nuclear material (SNM) to the ISFSI facility into the existing station SNM inventory and control procedure. The inspectors determined that the procedure contained verification and reporting procedures that met existing requirements.

Quality Assurance

The licensee's 10 CFR Part 50 Quality Assurance Program had been expanded to include the ISFSI. Specifically, the licensee had established measures for ensuring that: instruments used to verify compliance with Technical Specifications were controlled and calibrated; conditions adverse to quality were promptly identified and corrected; requirements, mechanisms, and responsibilities for documentation, control, evaluation, and disposition of nonconforming items and conditional releases were established; dry fuel storage components were properly stored to prevent degradation and, purchased material equipment and services conformed to procurement documents.

Radiation Protection/Criticality Prevention

Measures were established to limit personnel exposures to as low as reasonably achievable (ALARA). Considerations for exposure and contamination control had been incorporated into the procedures for canister gas sampling and re-flooding during unloading. The transfer cask annulus seal survey was accomplished in the proper sequence to ensure that the canister did not exit the building with contamination above the required limits. The total dose for the loading campaign was 1.442 man-rem which was less than the predicted dose of 1.53 man-rem.

The inspectors confirmed that the licensee implemented measures to monitor for and to prevent criticality during the cask loading. The minimum spent fuel pool boron concentration required by Technical Specifications was established. Criticality monitoring and alarm systems were installed in all areas where spent fuel was handled.

Training

The training and certification of personnel for ISFSI activities was conducted under the Seabrook Station 10 CFR 50 Training Program. The ISFSI training program was developed using a systematic approach to training. Only certified personnel or personnel under the direct supervision of a qualified supervisor were allowed to operate ISFSI equipment and systems important to safety.

The training had been conducted in the classroom and in the field. The classroom training included: an overview of the NUHOMS-HD system design; ISFSI facility design, structures, systems and components (SSCs) important to safety; NUHOMS-HD System final safety analysis report (FSAR), and, the NRC safety evaluation report (SER). The field training had been conducted during the dry run training exercise (pre-operational testing). The tasks that were taught during the dry run were consistent with the conditions of the Certificate of Compliance.

Configuration differences between the pre-operational cask lid welding demonstration and the initial DSC processing

Introduction: A Non-Cited Violation (NCV) was identified for Seabrook not performing a fully effective pre-operational demonstration of the welding of the inner top cover of the DSC as required by Certificate of Compliance (CoC) Condition 8.b.

Description: The inspectors observed activities associated with the first loading of spent fuel into dry storage using the NUHOMS Storage System to verify that the loading was performed safely, in accordance with approved procedures, and within the Technical Specification limits. The inspectors observed, however, that some difficulties were encountered during the welding of the inner top cover onto the DSC. Specifically, a shield bell, that was not present during the pre-operational welding demonstration, interfered with the operation of the automated welding system (AWS). The inspectors also observed that the welding process appeared to take longer to complete than expected, and required a number of in-process repairs to obtain satisfactory results; this increased the resultant radiation dose to the workers processing the initial cask. In addition, the inspectors questioned the proficiency of the qualified welder after observing a contractor assist the welder by manipulating the AWS controls. The inspectors discussed these concerns with Seabrook Station management and determined that the welders processing the initial cask, while qualified in accordance with the ASME Code requirements, had not been involved with the pre-operational demonstration required by CoC Condition 8.b. Seabrook management also reported that the contractor had been manipulating the AWS

controls under the constant direction and supervision of the qualified welder. While the weld was subsequently completed and accepted in accordance with the required non-destructive testing requirements, Seabrook temporarily suspended activities, to conduct training for the welding crews, and to obtain the welders that had been involved with the CoC-required welding demonstration. Seabrook also restricted subsequent manipulation of the AWS controls by anyone other than one of the qualified welders.

After the welding activities resumed, an NRC inspector observed the performance of the inner and outer top cover welding, the drain and vent cover plate welding, and the associated nondestructive examinations (NDEs), including visual examinations (VT), dye penetrant testing (PT), and helium leak testing of the DSC closure welds. The inspector also reviewed the qualification experience records of the welders and the NDE technicians; the use of the work package and timeliness of signoff of completed work steps; the coverage of work in progress by Quality Assurance (QA); management involvement; the fidelity between the pre-welding "dry run" activities to the work steps associated with the second canister (DSC #8); the use of mini-job briefs for work crew coordination; and the overall effectiveness of the corrective action implemented to resolve the identified issues. In addition, the inspector observed the water draining, helium gas filling, and vacuum drying process and use of the related equipment and procedures for the DSC.

The inspectors determined that Seabrook's corrective actions had been effective. However, the inspectors attributed the initial observations to equipment and personnel differences between the welding pre-operational demonstration required by CoC 8.b and the initial DSC welding. In addition, the inspectors questioned the acceptability of allowing a non-ASME Code qualified individual to manipulate the AWS controls during the performance of a production weld. Seabrook initiated condition report 08-12686 to review this issue and committed to seek a formal response from the ASME Code committee regarding this question.

Analysis: The performance deficiency associated with this finding involved not ensuring that the pre-operational welding demonstration (including the equipment configuration and personnel used) was consistent with the actual DSC welding activities. This issue is greater than minor since it increased the time to process the initial cask and increased the radiological dose to the workers. In addition, not performing a representative pre-operational demonstration had the potential to affect the quality of the DSC weld.

Enforcement: The question regarding the acceptability of allowing a non-qualified individual to manipulate the AWS controls during the performance of a production weld will remain unresolved pending receipt of the formal disposition to CR 08-12686; **URI 07200063/2008001-001, Acceptability of Allowing a Non-Qualified Individual to Manipulate the Automated Welding Controls During a Production Weld.**

Condition 8.b of the Certificate of Compliance, requires, in part, that a pre-operational demonstration of the closure of the NUHOMS-HD System be conducted by the licensee prior to the first use of the system to load spent nuclear fuel assemblies and that the dry run shall include loading operations, including DSC sealing. Contrary to the above, the licensee did not conduct a pre-operational demonstration that adequately represented the conditions encountered during welding of the lid of the initial DSC. The inspectors determined that this was a Severity Level IV violation consistent with Supplement I.D.3 of the NRC's Enforcement Policy. However, because the licensee initiated a plan to restore compliance within a reasonable time after the violation was identified, entered the issue into the corrective action program (CR 08-10586) to prevent recurrence, and because the issue was neither repetitive nor willful, this violation is being treated as Non-Cited (NCV), consistent with Section VI.A.1 of the NRC Enforcement Policy:
NCV 07200063/2008001-002, Failure to Conduct an Adequate Dry Run.

c. Conclusions: FPL Seabrook demonstrated the ability to and safely transferred spent fuel to the ISFSI. One NCV was identified for not conducting a fully representative pre-operational demonstration of the welding process.

.2 Exit Meeting Summary

The inspectors presented the inspection results to Seabrook personnel at the conclusion of the inspection on October 22, 2008. The licensee acknowledged the findings presented.

ATTACHMENT

SUPPLEMENTAL INFORMATION

PARTIAL LIST OF PERSONS CONTACTED

Licensee Personnel
M. Arsenalt, AOM
V. Brown, Senior Licensing Analysts
B. Buerger, DFS Project Manager
L. Church, ISFSI Project Manager of Operations
D. Currier, Emergency Preparedness Manager
P. Freemen, Plant General Manager
D. Hampton, Radiation Protection
G. Kilby, Licensing Engineer
K. Mahoney, Reactor Engineering
E. Metcalf, Operations Manager
M. O'Keefe, Licensing Manager
R. Noble, Engineering Manager
J. Tucker, Security Manager
J. Watts, Nuclear Oversight Supervisor
K. Whitney, Materials Engineering Supervisor
K. Wright, Training Manager

Contractor Personnel
J. Chapman
J. Kelley

INSPECTION PROCEDURES USED

60854.1	Pre-operational Testing of Independent Spent Fuel Storage Installations at Operating Plants
60855.1	Operation of an Independent Spent Fuel Storage Installation at Operating Plants
60856.1	Review of 10 CFR 72.212(b) Evaluations at Operating Plants
60857	Review of 10 CFR 72.48 Evaluations

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

07200063/2008001-001	URI	Acceptability of Allowing a Non-Qualified Individual to Manipulate the Automated Welding Controls During a Production Weld

Opened and Closed

07200063/2008001-002 NCV Failure to Conduct an Adequate Dry Run

Discussed

None.

LIST OF ACRONYMS

ALARA	As Low As Reasonably Achievable
ASME	American Society of Mechanical Engineers
AWS	American Welding Society
CFR	Code of Federal Regulations
CoC	Certificate of Compliance
DSC	Dry Shielded Canister
EAL	Emergency Action Level
FSAR	Final Safety Analysis Report
HSM	Horizontal Storage Module
IP	Inspection Procedure
ISFSI	Independent Spent Fuel Storage Installation
NCV	Non-cited Violation
NDE	nondestructive examination
NMSS	Office of Nuclear Materials Safety and Safeguards
NRC	Nuclear Regulatory Commission
PT	Penetrant Testing
QA	Quality Assurance
SER	safety evaluation report
SNM	Special Nuclear material
SSCs	structures, systems and components
VT	visual examination