

U.S. NUCLEAR REGULATORY COMMISSION
REGION I

INSPECTION REPORT

Inspection No. 05000245/2011007

Docket No. 05000245

License No. DPR-21

Licensee: Dominion Nuclear Connecticut, Inc.

Location: Millstone Power Station, Unit 1
Rope Ferry Road, Waterford, CT 06385

Inspection Dates: July 11 - 13, 2011

Inspector: Laurie A. Kauffman
Health Physicist
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Division of Nuclear Materials Safety

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Division of Nuclear Materials Safety

EXECUTIVE SUMMARY

Dominion Nuclear Connecticut, Inc.
Millstone Power Station Unit 1
NRC Inspection Report No. 05000245/2011007

A routine announced safety inspection was conducted from July 11-13, 2011, at the Millstone Power Station Unit 1 (U1) by a region-based inspector. The NRC's program for overseeing the safe operation of a shut-down nuclear power reactor is described in Inspection Manual Chapter (IMC) 2561, "Decommissioning Power Reactor Inspection Program." The inspector reviewed the licensee's programs associated with U1, including the Spent Fuel Pool Island (SFPI), while in SAFSTOR status. There are no ongoing decommissioning activities being conducted at Millstone U1. Within the scope of this inspection, no safety concerns or violations were identified. The conclusions from each inspection area are presented below.

Organization and Management Controls Program

The roles and responsibilities for the operation, maintenance, and control of U1 SAFSTOR program, required in Technical Specifications (TS) and the Defueled Safety Analysis Report (DSAR), were adequate to support U1 activities.

Design Changes and Modifications Program

The design change program was adequate to ensure systems and components, important for maintaining the safe storage of spent fuel, were operable and reliable. The licensee implemented the plant modification packages in accordance with the regulations in 10 CFR 50.59 and the requirements of the TS and the DSAR.

Corrective Action Program

The licensee's corrective action program (CAP) for identifying, resolving, and preventing conditions that could degrade safety or the quality of decommissioning activities was adequate. The threshold for identifying concerns and the priority for addressing condition reports (CRs) and implementing corrective actions were adequate and based upon safety significance.

Spent Fuel Pool Safety Program

The licensee effectively implemented the SFPI program to ensure that systems and components important for maintaining the safe storage of spent fuel were operable and reliable.

Maintenance and Surveillance Program

The licensee implemented a preventive maintenance and surveillance program to ensure systems and components important to maintaining the safe storage of spent fuel were operable and reliable. Established controls and measures to plan, schedule, and perform work activities were adequate.

Occupational Radiation Exposure Program

The licensee radiation protection controls were adequate to limit exposures of workers to external sources of radiation. Posting and labeling of radioactive materials and radiation areas met regulatory requirements. Radiological controls and dose estimates associated with U1 tasks were effective to achieve dose goals.

Radiological Effluent Control and Radioactive Environmental Monitoring Programs

The licensee maintained adequate radioactive effluent control and radiological environmental monitoring programs in accordance with regulatory requirements.

Solid Radioactive Waste Management and Transportation Programs

The licensee effectively implemented the radioactive waste management and transportation programs.

REPORT DETAILS

1.0 Background

The Millstone site is located in the town of Waterford, Connecticut. Millstone U1 was a single-cycle, boiling water reactor with a thermal output of 2011 megawatts and a net electrical output of 652.1 megawatts. The plant went into commercial operation on December 28, 1970 and permanently ceased operations on July 17, 1998. Subsequently, the fuel was permanently removed from the reactor vessel and stored in the spent fuel pool.

2.0 Organization and Management Controls Program

a. Inspection Scope (Inspection Procedure (IP) 36801)

The inspector discussed the roles and responsibilities for the operation, maintenance, and control of the SAFSTOR program, required in TS 5.1 through 5.4 and described in the DSAR. The inspector also evaluated the reduction in force (RIF) to determine the effect on the staff's overall ability to implement the SAFSTOR program.

b. Observations and Findings

The inspector verified that TS 5.1 through 5.4 were implemented, and that the DSAR and associated procedures were consistent with the TS requirements. During the previous inspection, the licensee underwent a RIF between March 1, 2010 and June 1, 2010. During this inspection, the inspector discussed the challenges encountered with the staff and noted the SAFSTOR activities, including the safe operation of the Spent Fuel Pool (SFP) and its associated equipment were maintained. The inspector noted that the U1 staff continued to obtain assistance from Millstone plant personnel to complete surveillance procedures and tasks required by U1 TS and procedures. No adverse trends or safety concerns were identified.

c. Conclusions

The roles and responsibilities for the operation, maintenance, and control of U1 SAFSTOR program, required in TS and the DSAR, were adequate to support U1 activities. No safety concerns or violations were identified.

3.0 Design Changes and Modifications Program

a. Inspection Scope (IP 37801)

The inspector reviewed the procedures describing the design change program and the documentation for two U1 plant modifications related to the Main Exhaust Fan HVE-1A Motor and the Waste Water Processing System. The inspector reviewed the design change packages against the regulations in 10 CFR 50.59 and the requirements of the TS and the DSAR to determine if the licensee ensured that systems and components important for maintaining the safe storage of spent fuel were operable and reliable. Specifically, the inspector reviewed the submitted design change packages to verify if the licensee had appropriately determined whether the design changes required: a 10 CFR 50.59 safety evaluation; license or TS amendment; and/or a DSAR update.

b. Observations and Findings

The inspector reviewed the plant modification packages and verified they included a Design Change Request and a Design Change Notice (DCN). The DCN process was used to describe the systems or components to be changed, propose solutions, and to justify changes. The DCN was used to determine whether a 10 CFR 50.59 safety evaluation, a license or TS amendment, and/or a DSAR update were required for both design changes. In particular, the licensee determined that only the Waste Water Processing System required a DSAR update. The licensee drafted changes to the DSAR Section 4, as applicable, to allow the release of the reactor building sump water through the Emergency Service Water discharge piping and through the discharge canal. The draft changes are under review by the licensing department. No adverse trends or safety concerns were identified.

c. Conclusions

The design change program was adequate to ensure systems and components, important for maintaining the safe storage of spent fuel, were operable and reliable. The licensee implemented the plant modification packages in accordance with the regulations in 10 CFR 50.59 and the requirements of the TS and the DSAR. No safety concerns or violations were identified.

4.0 Corrective Action Program

a. Inspection Scope (IP 40801)

The inspector reviewed the corrective action program (CAP) for identifying, resolving, and preventing conditions that could degrade safety or the quality of decommissioning activities. The inspector reviewed the procedures describing the CAP and reviewed several selected CRs.

b. Observations and Findings

The license initiated CRs in accordance with the site CAP to identify and resolve conditions that may impact SAFSTOR activities. The inspector reviewed two self-identified concerns that were documented in CRs. The concerns were related to a ventilation fan and a SFP Gate Leakage Alarm. The license investigated and corrected both concerns.

The inspector reviewed a CR that the licensee issued during a special NRC inspection pursuant to Temporary Instruction (TI2515/183) relating to the March 2011 Fukushima Daiichi Nuclear Station fuel damage event. [For details of the TI2515/183 inspection, refer to ADAMS Accession Number ML111320660.] As a result of the TI2515/183 inspection, the inspector identified an enhancement associated with the position of the U1 SFP crane. Specifically, the crane was over the center of the pool rather than at one end. During this inspection, the inspector observed the U1 crane operator reposition the SFP crane to one end of the SFP. No adverse trends or safety concerns were identified.

c. Conclusions

The licensee's CAP for identifying, resolving, and preventing conditions that could degrade safety or the quality of decommissioning activities was adequate. The threshold for identifying concerns and the priority for addressing CRs and implementing corrective actions were adequate and based upon safety significance. No safety concerns or violations were identified.

5.0 Spent Fuel Pool Safety Program

a. Inspection Scope (IP 60801)

The inspector evaluated the licensee's program for ensuring the safe storage of spent fuel in the SFP. The inspector reviewed and compared the DSAR, TS, and Technical Requirements Manual (TRM) with associated procedures to ascertain that they were consistent with the SFPI requirements.

The inspector performed a tour of the reactor building to evaluate the general condition of the building, systems, and components including: SFP cooling and ventilation system; decay heat removal (DHR) pumps and motors; emergency diesel generator (EDG); the east corner room; and the torus room. The inspector performed a tour of the radioactive waste facility to evaluate the general material condition of the facility and equipment including the facility sump. The inspector discussed with the licensee the spent fuel rack test that was performed in June 2011.

b. Observations and Findings

The inspector toured the facility and verified that systems and components important to the safe storage of spent fuel were operable and adequately maintained. The inspector observed several leak detection stations and noted no obvious SFP leakage. The inspector noted that the SFP temperature and water level, the SFP cooling rates, and the DHR system flow rates were monitored in accordance with the TS, TRM, and established procedures. The inspector determined that plant personnel conducted the routine system operational checks at the required frequencies. No adverse trends or safety concerns were identified.

One area not evaluated by the inspector was the spent fuel rack test (also called the Boron-10 (B-10) Areal Density Gauge for Evaluating Racks (BADGER) test) in June 2011. The results of the BADGER test were not available at the time of this inspection. The inspector will review the final test results during a subsequent inspection.

c. Conclusions

The licensee effectively implemented the SFPI program to ensure that systems and components important for maintaining the safe storage of spent fuel were operable and reliable. No safety concerns or violations were identified.

6.0 Maintenance and Surveillance Program

a. Inspection Scope (IP 62801)

The inspector reviewed the licensee's preventive maintenance and surveillance program including the planned and completed maintenance and surveillance activities of systems and components important for maintaining the safe storage of spent fuel. The inspector reviewed selected maintenance and surveillance test results for the SFP cooling pumps and motors; the DHR pumps, fans, and motors; the ventilation fans and motors; and the EDG to verify that work was being performed within the established frequencies and that the equipment was being properly maintained. The inspector also reviewed the annual reactor building bridge and hoist inspection, and the refuel platform load switch calibration procedures.

b. Observations and Findings

The maintenance and surveillance test results for the SFP cooling pumps and motors; the DHR pumps, fans, and motors; the ventilation fans and motors; the EDG; the reactor building bridge and hoist; and the refuel platform load switch were thorough, performed within the established frequencies, and met the acceptance criteria defined in the associated procedures. The inspector determined that the systems and components were operable and available for service.

c. Conclusions

The licensee implemented a preventive maintenance and surveillance program to ensure systems and components important to maintaining the safe storage of spent fuel were operable and reliable. Established controls and measures to plan, schedule, and perform work activities were adequate. No safety concerns or violations were identified.

7.0 Occupational Radiation Exposure Program

a. Inspection Scope (IP 83750)

The inspector reviewed implementation of the occupational exposure control program associated with SAFSTOR and SFPI activities. The inspection consisted of interviews with responsible individuals, reviews of documents and postings; and observations of a radiation protection technician conduct routine surveys in the reactor building.

b. Observations and Findings

The inspector conducted a plant tour and determined that radiological postings were readily visible, well maintained, and reflected radiological conditions. The survey maps and related information maintained at the U1 access point were current. The high radiation areas and the TS locked high radiation areas were properly posted and locked as required.

The inspector reviewed the 2010 and 2011 year-to-date exposure reports, the 2011 as low as reasonably achievable (ALARA) evaluation for the SFP BADGER test, and the associated radiation work permits. The dose totals for 2010 and 2011 year-to-date dose reports were 0.142 mrem and 0.154 mrem, respectively. The largest contribution of the

2011 dose was due to the SFP BADGER testing and SFPI instrument calibrations. The inspector noted that the associated radiation work permits were commensurate with the radiological significance of the task and included the appropriate exposure control measures for the safe implementation of the activity. The inspector determined the licensee provided adequate exposure controls to limit the exposure of workers to external sources of radiation and used established methods to track and trend radiation dose.

c. Conclusions

The licensee radiation protection controls were adequate to limit exposures of workers to external sources of radiation. Posting and labeling of radioactive materials and radiation areas met regulatory requirements. Radiological controls and dose estimates associated with U1 tasks were effective to achieve dose goals. No safety concerns or violations were identified.

8.0 Radiological Effluent Control and Radioactive Environmental Monitoring Programs

a. Inspection Scope (IP 84750)

The inspector reviewed the radioactive effluent control and the radiological environmental monitoring programs associated with SAFSTOR and SFPI activities.

b. Observations and Findings

The inspector reviewed the annual radiological environmental operating report and the annual radioactive effluent release report and determined that the reports were submitted to the NRC in accordance with TS 5.7.2 and TS 5.7.3, respectively. The calculated doses were below the regulatory dose criteria of 10 CFR 50, Appendix I. The effluent and radiological environmental monitoring programs were implemented in accordance with TS requirements.

During the previous inspection, the inspector identified significant rainwater in-leakage into the radioactive waste building. The inspector reviewed the renovations to the building since the last inspection, which included repairing cracks in the walls and ceilings. The licensee is completing a new waste water processing system to manage liquid effluent from the waste building. The inspector determined that there had been no rainwater in-leakage since the previous inspection.

c. Conclusions

The licensee maintained adequate radioactive effluent control and radiological environmental monitoring programs in accordance with regulatory requirements. No safety concerns or violations were identified.

9.0 Solid Radioactive Waste Management and Transportation Programs

a. Inspection Scope (IP 86750)

The inspector evaluated the radioactive waste management and transportation programs to determine whether the licensee properly processed, packaged, stored, and shipped radioactive materials. The inspector reviewed the waste stream analysis for dry active waste required by 10 CFR 61.

b. Observations and Findings

The licensee manages an asset recovery program to remove systems and/or components that are no longer needed for the safe operation of the SFP. The licensee removed and disposed three U1 feed pump motors (2M-10A, B, & C) and accessories in March 2010. The motors and accessories were classified as low specific activity (LSA) material. The radioactive waste shipment records included copies of characterization reports and waste manifest shipping papers and were complete. The licensee met the applicable radioactive waste and transportation requirements for the shipments reviewed.

c. Conclusions

The licensee effectively implemented the radioactive waste management and transportation programs. No safety concerns or violations were identified.

Exit Meeting Summary

On July 13, 2011, the inspector presented the preliminary inspection results to Jeffrey Semancik, Millstone Plant Manager, and members of his staff. The inspector confirmed that proprietary information was not provided or examined during the inspection.

PARTIAL LIST OF PERSONS CONTACTED

Licensee

W. Bartron	Licensing Supervisor
D. Delcore	Nuclear Oversight Specialist
J. Drzewianowski	Radiation Protection Technician
A. Elms	Organizational Effectiveness Manager
S. Heard	Site Services Manager
E. Palmieri	Nuclear Maintenance Supervisor
L. Salyards	Licensing Engineer
J. Semancik	Plant Manager
G. Sturgeon	Operations Nuclear Specialist

INSPECTION PROCEDURES USED

36801	Organization, Management, and Cost Controls at Permanently Shutdown Reactors (PSRs)
37801	Safety Reviews, Design Changes, and Modification at PSRs
40801	Self Assessment and Corrective Action
60801	Spent Fuel Pool Safety at PSRs
62801	Maintenance and Surveillance at PSRs
71801	Decommissioning Performance and Status Reviews at PSRs
83750	Occupational Radiation Exposure
84750	Radioactive Waste Treatment and Effluent and Environmental Monitoring
86750	Solid Radioactive Waste Management and Transportation

ITEMS OPEN, CLOSED, AND DISCUSSED

None

LIST OF DOCUMENTS REVIEWED

Millstone U1 Radiation Surveys conducted between April 2010 and July 2011
Millstone U1 Radiation Exposure (ALARA) Reports for 2010, and most current for 2011
Millstone U1 Surveillance Form for Operator Logs and Inspections (U1 rounds)
Work Order 53102390415 associated with the quarterly run
Work Order 53102281885 associated with the annual inspection of the diesel generator
Asset Recovery Information conducted between March 2010 and June 2011
Summary of Millstone U1 Condition Reports between March 2010 and June 2011
CR 368109 "Unit 1 Reactor Building Crane will Not Raise or Lower"
CR 405562, "MP1 Balance of Plant (BOP) Ventilation Exhaust Fan Failure"
CR 422447, "Control of Unit 1 Refuel Platform Position in Spent Fuel Pool Needs Enhancement"
CR 428247, "Unit 1 Spent Fuel Pool Gate Leakage Alarm no Functioning as Designed"

LIST OF ACRONYMS USED

ADAMS	Agencywide Documents Access and Management System
BADGER	Boron-10 (B-10) Areal Density Gauge for Evaluating Racks test
CAP	corrective action program
CFR	Code of Federal Regulations
CR	condition report
DCN	Design Change Notice
DSAR	defueled safety analysis report
IMC	inspection manual chapter
mrem	millirem
NRC	Nuclear Regulatory Commission
PARS	Publicly Available Records System
PSRs	Permanently Shutdown Reactors
SFP	spent fuel pool
SFPI	spent fuel pool island
TRM	technical requirements manual
TS	technical specification
U1	Unit 1