



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

July 21, 2000

Docket No. 05000245

License No. DPR-21

Mr. S. E. Scace, Director
Nuclear Oversight and Regulatory Affairs
Northeast Nuclear Energy Company
P.O. Box 128
Waterford, Connecticut 06385

SUBJECT: NRC INSPECTION 05000245/2000-005

Dear Mr. Scace:

On June 2, 2000, the NRC completed an inspection at your Millstone Unit 1 facility. The findings of the inspection were discussed with Mr. Larry Temple and others of your staff on June 22, 2000. The enclosed report presents the results of that inspection.

During the four month period covered by this inspection, you conducted decommissioning activities at Millstone Unit 1 in a safe manner, and in general, maintained appropriate focus on the safe storage of fuel in the spent fuel pool. There were several industrial safety and radiological protection issues at Unit 1 that challenged your organization. Your response to these events and your willingness to perform independent assessments have resulted in improved performance toward the latter part of the inspection period. In addition, the implementation of your radiation protection improvement plan and corrective action implementation and effectiveness will be important as you begin more active decommissioning activities in the near future.

During the inspection period, the NRC identified two Severity Level IV violations of NRC requirements. The violations involved (1) the failure to record spent fuel pool level as required by technical specifications, and (2) the failure to perform a contamination survey in accordance with 10 CFR 20. The two violations are being treated as Non-Cited Violations (NCVs), consistent with Section VI.A of the Enforcement Policy, issued on May 1, 2000 (65 FR 25368). The NCVs are described in the enclosed inspection report.

If you contest the violation or severity level of the NCVs, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington DC 20555-0001; with copies to the Regional Administrator, Region I; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at the Millstone facility.

Mr. S. E. Scace

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Sincerely,

/RA/

Ronald R. Bellamy, Chief
Decommissioning and Laboratory Branch
Division of Nuclear Materials Safety

Docket No. 05000245

Enclosure: NRC Inspection Report No. 05000245/2000-005

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**U.S. NUCLEAR REGULATORY COMMISSION
REGION I**

INSPECTION REPORT

Inspection No. 05000245/2000-005

Docket No.: 05000245

License No.: DPR-21

Licensee: Northeast Nuclear Energy Company

Location: Waterford, CT 06385

Facility: Millstone Nuclear Power Station, Unit 1

Inspection Dates: January 29, 2000 - June 2, 2000

Inspectors: P. C. Cataldo, Resident Inspector, Unit 1
T. J. Jackson, CHP, Health Physicist

Approved by: Ronald R. Bellamy, Chief
Decommissioning and Laboratory Branch, DNMS

EXECUTIVE SUMMARY

Millstone Nuclear Power Station
NRC Inspection No. 05000245/2000-005

This integrated inspection included aspects of licensee operations, maintenance, engineering, and plant support during decommissioning activities. The report covers a four-month period of announced inspections by the Resident Inspector and one regional inspector. Two non-cited violations were identified.

Operations

The inspector concluded that the licensee has conducted decommissioning activities in a manner that assured continued safe storage of spent fuel in the Unit 1 spent fuel pool. (O2.1)

The inspector determined that the licensee's investigation regarding adverse trends in industrial safety was thorough and appropriate. (O8.1)

The inspector concluded that the licensee's failure to record the spent fuel pool level as required by both surveillance procedures and technical specifications is a violation of NRC requirements and has resulted in the issuance of a non-cited violation. In addition, the failure to perform an adequate reportability determination is considered a weakness. The licensee's corrective actions have been implemented and are considered acceptable. The inspector also closed a historical unresolved item (URI) that involved the submittal of inaccurate operator license qualification statements. (O8.2)

Maintenance

The inspectors concluded that although the licensee encountered planning and preparation difficulties, overall, the licensee adequately executed the removal, packaging and shipment of Control Rod Drive Mechanisms. (M1.1)

The inspector observed the main stack radiation monitor calibration and concluded it was well-conducted, with good peer and self-checking. (M2.1)

Engineering

The licensee continues their progress in the separation of Unit 1 systems from Units 2 and 3. The 4160V project is a major task that impacts various other separation projects, and is a prerequisite to the attainment of "cold and dark" status at Unit 1. The licensee has maintained a very good focus on the minimization of impact on the two operational units as they proceed with systems separation. (E2.1)

The inspector concluded that the licensee's technical evaluations, as well as safety evaluations conducted in accordance with 10 CFR 50.59, adequately supported various activities of the spent fuel pool cleanup project, and addressed the appropriate factors to ensure the safe storage of fuel in the spent fuel pool. (E2.2)

Plant Support

The licensee provided good radiological controls and support during both the processing of material from the spent fuel pool and movements of the TN-RAM cask for ultimate shipment off-site. However, the inspector identified a weakness in maintaining personnel dose ALARA and a procedural violation of minor significance. (R1.1)

The inspector concluded that the licensee's activities regarding the processing and shipment of the TN-RAM cask that contained items from the spent fuel pool were conducted appropriately, and the licensee satisfactorily completed four cask shipments without incident. (R1.2)

The inspector concluded that radioactive sources identified in abandoned radiation monitors were adequately controlled, with appropriate action taken by the licensee to control personnel exposure to the sources. (R2.1)

The inspector concluded that the licensee's root cause investigations that were initiated following the identification of two radiation protection events were comprehensive, provided good correlation between the root cause and recommended corrective actions, and appear to adequately address the various human performance and programmatic issues that have been prevalent in the radiation protection program during the inspection period. However, several examples were identified of failure to follow procedures, as well as a non-cited violation regarding the failure to perform a survey. (R8.1)

The inspector concluded that the failure of the licensee to properly classify safeguards information transmitted to the NRC was a violation of minor significance that is not subject to enforcement action and is considered a program weakness. (S1.1)

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Report Details

Summary of Unit 1 Status

The licensee has conducted decommissioning activities in a safe manner. Industrial safety and radiological protection issues of low safety significance were identified that were adequately addressed. On May 1, 2000, Walter Perks assumed the duties of Director, Unit 1 Operations.

Major activities completed by the licensee during the inspection period include: removal of control rod drive mechanisms from under-vessel; the continued re-characterization and abandonment of plant systems, structures, and components consistent with the decommissioning status of the unit; the processing and removal of control rod drive blades, local power range monitor detectors, stellite, and other items from the spent fuel pool, and subsequent placement into a transport cask for shipment and burial off-site; and the removal of insulation (asbestos and non-asbestos) from various plant systems and components.

I. Operations

O1 Conduct of Operations

O1.1 Decommissioning Performance (71801)

The inspector conducted frequent reviews of decommissioning activities throughout the inspection period through plant tours, control room observations, and attendance at various plant management meetings.

Control room operators have maintained an appropriate focus on the remaining plant systems important in the current decommissioning state (i.e., spent fuel pool cooling) and also on those systems important to the continued operation of Units 2 and 3. For example, the Unit 1 stack high range noble gas effluent monitor underwent an unplanned outage in January 2000. The inspector verified that a special report was submitted to the NRC as required by the Millstone Station Radiological Effluent Monitoring & Offsite Dose Calculation Manual. The stack gas monitoring system also exhibited a number of failures during the inspection period. The inspector verified that the licensee reported the failures to the Unit 2 and Unit 3 control rooms due to the technical specification (TS) applicability associated with each unit. The inspector observed the licensee maintain an adequate focus on permanently defueled technical specification (PDTS) compliance.

The inspector observed various work activities preceded by pre-job briefs, which have been adequate to prepare the workers for performance of the specific tasks, including the spent fuel pool (SFP) cleanup, control rod drive removal, and other projects. However, some weaknesses were identified in the radiation protection area relative to worker briefings, ALARA, and the identification of radiation and safety hazards.

Toward the end of the inspection period, the licensee completed several self-assessments and root cause investigations relative to industrial safety and radiation protection practices. Interim corrective actions that were established as a result of these efforts have improved the implementation of programs and processes at the Unit. In addition, the inspector noted an improvement in the communication of expectations from

management to the workforce, which was previously identified as a contributing cause to a number of past performance problems. However, the implementation of a number of long-term corrective actions from the root cause investigations, past condition reports (CRs), and self-assessments have yet to be realized. In addition, the licensee initiated a radiation protection improvement plan to identify and correct deficiencies in the program, and is expected to complete a report on the effort during the next inspection period.

The inspector also reviewed the licensee's progress in reducing the number of operable plant systems and components consistent with the defueled safety analysis report (DSAR) and the PDTSSs. The inspector found that 10 CFR 50.59 safety screenings and evaluations were adequately conducted by trained personnel, and adequately addressed the appropriate impact on the plant (for example, whether a proposed change impacted the design basis accident).

O2 Operational Status of Facilities and Equipment

O2.1 Spent Fuel Pool Operations

a. Inspection Scope (60801)

The inspector reviewed the licensee's activities regarding the continued safe storage of spent fuel in the SFP.

b. Observations and Findings

The inspector determined that the licensee has maintained adequate focus on the safe storage of spent fuel in the SFP. Safety evaluations conducted in support of decommissioning activities have appropriately addressed fuel handling accidents, heavy loads, and other potential issues regarding the continued safe storage of spent fuel in the SFP, and remain consistent with 10 CFR 50.59 requirements. The licensee has maintained adequate focus on SFP safety during various reactor building crane operations, especially during the movements of the Trans-Nuclear radioactive material (TN-RAM) cask and the processing equipment utilized during the SFP cleanup project. In addition, the licensee has continued to ensure adequate chemistry controls for the SFP.

c. Conclusions

The licensee has conducted decommissioning activities in a manner that assured continued safe storage of spent fuel in the Unit 1 SFP.

07 Quality Assurance in Operations

07.1 On-Site and Off-Site Safety Organizations

a. Inspection Scope (71801)

The inspector observed various on-site and off-site licensee meetings, including Plant Operations Review Committee (PORC), Nuclear Safety Assessment Board (NSAB), and NSAB Decommissioning Subcommittee meetings. In addition, the inspector reviewed documents submitted for review by the applicable committee, such as safety evaluations and Licensee Event Reports.

b. Observations and Findings

The inspector attended various PORC, NSAB, and NSAB Decommissioning Subcommittee meetings throughout the inspection period. The inspector reviewed various documents including meeting minutes to determine if the on-site and off-site organizations had fulfilled the requirements set forth in the Millstone Unit 1 Northeast Utilities Quality Assurance Plan (NUQUAP). During the various meetings, the inspector observed good questioning from board/committee members that focused on important issues relative to decommissioning (such as SFP safety), appropriately addressed the technical adequacy of proposals, and initiated and tracked to resolution open issues identified at the meetings. In addition, the inspector verified that licensee management received feedback regarding the activities of each committee.

c. Conclusions

The on-site and off-site organizations have fulfilled their responsibilities in accordance with site procedures and provided appropriate tracking of issues identified during the various meetings.

08 Miscellaneous Operations Issues

08.1 Personnel Safety Issues

a. Inspection Scope (36801, 40801)

The inspector reviewed the licensee's response to, and investigation of, significant personnel safety issues.

b. Observations and Findings

On February 29, 2000, the licensee stopped all work activities at Millstone Unit 1 in response to near-miss safety events that included the dropping of an empty fuel storage rack that had been removed from the SFP and a lock-out/tag-out error. The fuel rack had dropped onto the refueling floor (elevation 108') as it was being moved to a shipping container at ground level elevation. Sharp edges on the rack had cut through the lifting

straps, causing the rack to drop several feet. No personnel injuries occurred as a result of the dropped rack.

The tagging error was considered significant by the licensee and NRC because the incorrect tagging had been independently verified as correct, and then again verified as correct by the work group that performed the related maintenance work. The tagging error was identified by an on-shift operator performing rounds, who noticed the tag on a spare breaker instead of the breaker required for the work activity. Work was immediately stopped until the tagging error was investigated and corrected.

The licensee determined that these safety issues were significant and stopped all work at Unit 1 in order for personnel to review work practices and activities. The dropped rack and the tagging error events were each the subject of separate CRs in the licensee's corrective action program. The licensee determined that several safety near-misses, including the two discussed above, could have related root causes and combined the separate CRs into one personnel safety CR (M1-00-0085).

The root cause analysis for CR M1-00-0085, "Adverse Trend in Industrial Safety Events", was presented to the Millstone 1 management review team (MRT) and accepted by the MRT on May 18, 2000. The root cause analysis determined that industrial safety performance standards and expectations have not been consistently communicated or monitored within the Unit 1 organization, and identified this as the root cause to be addressed to improve performance and prevent recurrence. The licensee is developing a corrective action plan to implement the corrective actions.

c. Conclusions

The licensee's investigation regarding the adverse trends in industrial safety was thorough and appropriate, and no violations of NRC requirements were identified.

O8.2 Inspection Of NRC Open Items

a. Inspection Scope (92700)

The inspector reviewed the current NRC open items to determine which items could be closed, and to address and disposition violations of NRC requirements, as applicable.

b. Observations and Findings

(Closed) Licensee Event Report (LER) 50-245/2000-01-00: Fuel Pool Level Technical Specification Surveillance Missed Due to Inadequate Work Practices.

On March 28, 2000, the licensee identified that the SFP level had not been recorded in accordance with TS Surveillance Requirement (TSSR) 4.10.C. The cause of the missed surveillance was identified as inadequate work practices, due to the failure of the control room operator to record the level, as well as failure of the Shift Manager to identify the error during operator log reviews. The actual level of the water in the SFP did not change during this period and was within limits at all times.

The licensee initiated adequate compensatory actions following identification of the missed surveillance, which included: (1) CR M1-00-0123 was generated for entry into the corrective action program; (2) the significance of the event was discussed with the individuals involved and Operations Department personnel, including barriers that failed and methods to prevent recurrence; (3) investigation of human performance aspects of the event, including generic implications and methods of improving human performance; and (4) the surveillance procedure was revised such that the fuel pool level is recorded twice per day.

The inspector also reviewed the reportability determination (RD) that was initiated by the licensee in accordance with unit procedures. The RD concluded, in part, that the CR was not reportable to NRC because Limiting Condition For Operation (LCO) 3.0.2 was met. However, this conclusion was not consistent with 10 CFR 50.73(a)(2)(i)(B), which requires the licensee to report any operation or condition prohibited by the plant's technical specifications. As a result, the inspector discussed the NRC requirements and guidelines as they relate to the issue of a missed TSSR being a violation of TSs, and also regarding the reportability of the missed fuel pool level event under 10 CFR 50.73. The licensee formally submitted an LER in accordance with NRC regulations, however, the failure to perform an adequate RD to ensure compliance with NRC regulations is considered a weakness.

TSSR 4.10.C, "Fuel Storage Pool Water Level," requires, in part, that the SFP level shall be recorded daily. Surveillance Procedure SP 696.1-001A, "Control Operator Logs," Section 4.8, "Fuel Pool Level," required fuel pool level to be recorded during the hours of 0800 to 1200 hours. Contrary to this requirement, the reading was recorded at 2100 hours on March 28, 2000. As a result, the fuel pool level was not recorded for a period of 33 hours, which is a violation of NRC requirements. The licensee's corrective actions taken in response to this violation were reviewed by the inspector and found to be adequate. This violation is therefore being treated as a Non-Cited Violation (**NCV 50-245/2000-05-01**), consistent with Section VI.A of the NRC Enforcement Policy, issued on May 1, 2000 (65 FR 25368). As a result, LER 50-245/2000-01-00 is **closed**.

(Closed) Unresolved Item (URI) 50-245/97-01-03: Inaccurate Personal Qualification Statements: As detailed in NRC Inspection Report 05000336/423/2000001 dated March 10, 2000, URI 50-336/423/97-01-03 was closed based upon the programmatic deficiencies of the operator training program being satisfactorily addressed by the licensee. Additionally, specific to Unit 1, the licensee certified to the NRC by letter dated July 21, 1998, that the licensee had permanently ceased operations and that fuel had been permanently removed from the reactor vessel. The NRC staff approved by letter dated February 11, 1999, the Millstone Unit 1 Certified Fuel Handler Training Program. As a result, plant activities in the decommissioning state no longer require the use of licensed operators and senior licensed operators. and all other aspects of licensed reactor operation in accordance with 10 CFR 50.55 are no longer applicable to Unit 1. Therefore, **URI 50-245/97-01-03 is closed**.

c. Conclusions

The licensee's failure to record the SFP level as required by both surveillance procedures and TSs is a violation of NRC requirements and has resulted in the issuance of a non-cited violation. In addition, the failure to perform an adequate RD is considered a weakness. The licensee's corrective actions have been implemented and are considered acceptable. The inspector closed a URI that involved the submittal of inaccurate operator license qualification statements.

II. Maintenance

M1 Conduct of Maintenance

M1.1 Control Rod Drive Mechanism (CRDM) Removal Project

a. Inspection Scope (71801, 60801)

The inspector reviewed the licensee's activities regarding the CRDM removal project.

b. Observations and Findings

The inspector observed the licensee perform various aspects of the CRDM removal project, including pre-job briefs and other activities.

- All but one of the 145 CRDMs were removed from under-vessel, followed by successful packaging and shipment off-site for disposal. The use of an experienced contractor for the CRDM project was instrumental in the expeditious and successful removal process.
- The licensee was unsuccessful in the uncoupling of one control rod blade, thus preventing removal of the last CRDM. The licensee continues to evaluate the condition.
- Nuclear Oversight inspectors were present for a number of evolutions during the CRDM removal process and provided independent feedback to applicable work groups in various areas such as radiation protection work practices (contamination controls, ALARA practices), corrective action follow-up, incorporation of "lessons learned," and industrial safety.
- Inadequate preparation resulted in work stoppages and unnecessary dose accumulation due to airflow problems and other issues regarding the bubble hoods that were initially utilized for worker protection under-vessel.
- Adequate radiation protection support was provided. However, deficiencies regarding radiation protection work practices were self-identified by work groups during the process, and also identified by Nuclear Oversight as previously discussed.
- Issues regarding inadequate communication between the appropriate personnel during the actual CRDM removal were initially identified and provided another example of poor planning. However, after the issue was identified, the licensee established adequate communication in support of the work to ensure worker safety.

c. Conclusions

Although the licensee encountered planning and preparation difficulties, overall, the licensee adequately executed the removal, packaging and shipment of 144 of 145 CRDMs. The licensee continues to evaluate options for handling the remaining coupled control blade and control rod drive mechanism.

M2 Maintenance and Material Condition of Facilities and Equipment

M2.1 Stack Gas Radiation Monitor Drawer Surveillance

a. Inspection Scope (62801)

The inspector observed calibration of the Unit 1 stack gas radiation monitor.

b. Observations and Findings

The inspector observed the performance of procedure C SP400.5, "Stack Gas Radiation Monitor Drawer Calibration," that occurred on April 13, 2000. The inspector observed good peer and self-checking during performance of the calibration, and found the workers very knowledgeable regarding various aspects of the job. The inspector noted that the calibration task was also used to provide on-the-job training for a Unit 3 Instrumentation and Control technician. This training activity was significant because the responsibility for performance of surveillances on certain shared systems such as this radiation monitor had been transferred from Unit 1 to the Millstone site organization. The inspector verified that the appropriate TS requirements were addressed for the applicable Units during the performance of the calibration.

c. Conclusions

The main stack radiation monitor drawer calibration was well conducted, with good peer and self-checking, and good utilization of site personnel for the performance of the surveillance.

III. Engineering

E2 Engineering Support of Facilities and Equipment

E2.1 Unit 1 Separation From Units 2 And 3

a. Inspection Scope (71801, 37801)

The inspectors reviewed the status of work to physically separate Unit 1 from Units 2 and 3.

b. Observations and Findings

The licensee had identified 18 engineering projects necessary to accomplish the physical separation of Unit 1 from the operating units. The licensee identified four of the separation projects expected to require an outage at Unit 2 for completion, and which were included in the recent Unit 2 outage: 4160V electrical distribution modifications; Unit 1 main stack modifications to support Unit 2 enclosure building ventilation discharge; a new hydrogen storage tank installation; and severe line outage detection system changes. Three of the four projects, with the exception of the 4160V project, were completed during the recent Unit 2 refueling outage. The 4160V project will transfer supply of station blackout emergency power, Appendix R Fire Protection support, and off-site power capabilities from Unit 1 to Unit 3. Major schedule changes have occurred in the 4160V project as a result of the quality of design output from the contractor, and the multiple refinements and revisions to several calculations in support of the project. The remaining projects, including items such as heating steam, domestic water, and communications, did not require outages for implementation and are in various stages of completion.

c. Conclusions

The licensee continues their progress in the separation of Unit 1 systems from Units 2 and 3. The inspector found that the licensee has been appropriately focused on the separation of Unit 1 to minimize the impact to the operating units. In addition, the initial comprehensive systems screening performed by the licensee identified shared systems, addressed the impacts of the shared components on the individual units, and identified the necessary modifications that would be required to complete separation. The 4160V project is a major task that impacts various other separation projects, and is a prerequisite to the attainment of “cold and dark” status at Unit 1.

E2.2 Spent Fuel Pool Cleanup

a. Inspection Scope (37801, 71801)

The inspector reviewed various engineering documents in support of the SFP cleanup project.

b. Observations and Findings

The inspector reviewed technical evaluations and safety evaluations in support of the SFP cleanup project. The documents were used to support various vendor procedures and processes in support of the SFP cleanup activities, i.e., control of the TN-RAM cask.

The inspector found the technical evaluations and safety evaluations were comprehensive and addressed the major issues associated with the SFP cleanup, including seismic interactions, effects of heavy loads, and effects on the spent fuel. Specifically, the licensee’s evaluations addressed the seismic interactions of the underwater shear compactor (USC), the TN-RAM cask and associated liners, and other equipment, and concluded that all equipment with the exception of the TN-RAM cask were bounded by calculations for seismic response and effects on the SFP floor, the SFP, and the cask pad, as applicable. The licensee addressed the seismic design issues related to the TN-RAM cask by precluding travel of the cask over spent fuel with

the crane travel restrictions implemented by operation in Mode 2 (automatic limitations on crane position, implemented through selection of Mode-switch position), as well as the use of redundant rigging to address a potential cask drop.

c. Conclusions

The inspector concluded that the licensee's technical evaluations and safety evaluations conducted in accordance with 10 CFR 50.59 adequately supported various activities of the SFP cleanup project, and also addressed the appropriate factors to ensure the safe storage of fuel in the SFP.

IV. Plant Support

R1 Radiological Protection and Chemistry (RP&C) Controls

R1.1 Radiation Protection and Controls During The Spent Fuel Pool Cleanup

a. Inspection Scope (83750)

The inspector reviewed the licensee's radiation protection practices during the removal of various items from the SFP.

b. Observations and Findings

The inspector observed radiation protection activities during the processing, packaging, and shipment of various items from the SFP. The inspector observed good pre-job briefings that addressed appropriate radiation protection topics, industrial safety and other personnel safety topics, and were attended by the appropriate personnel. In general, the radiation work permit (RWP) created for the job was detailed and contained the necessary controls to maintain dose As Low As Reasonably Achievable (ALARA).

While personnel contaminations occurred during the various activities, none were significant and the licensee responded appropriately. During various movements of the TN-RAM cask, proper contaminated area boundaries were established and de-posted as appropriate. The inspector observed good decontamination efforts on the TN-RAM cask to ensure personnel contaminations were minimized and that radiation dose and contamination levels were within regulatory limits for transportation off-site.

To facilitate the transfer of liners into the TN-RAM cask, the USC was removed from the SFP and placed into a pre-staged tent on the 108' elevation. Unanticipated contamination and radiation readings resulted in the posting of the tent as a high radiation area (HRA), as well as the placement of ALARA caution signs in the vicinity of the tent. The licensee appropriately controlled the USC, and later relocated the tent to a less-traveled area on the floor for subsequent USC removals from the SFP. The inspector found the licensee's decision to leave the USC staged in an area that did not maintain dose to personnel ALARA to be a weakness. In addition, the licensee failed to document their review of the original USC tent location as required by plant procedures, which the inspector noted was a procedural violation of minor significance. The

inspector discussed this issue with RP personnel and the review was subsequently documented.

c. Conclusions

The licensee provided good radiological controls and support during both the processing of material from the SFP and movements of the TN-RAM cask for ultimate shipment off-site. However, the inspector identified a weakness in maintaining personnel dose ALARA and a procedural violation of minor significance.

R1.2 Radioactive Waste Management During The Spent Fuel Pool Cleanup Project

a. Inspection Scope (86750)

The inspector reviewed the licensee's activities during the processing and shipment of the TN-RAM cask.

b. Observations and Findings

The inspector observed various activities regarding the processing of the TN-RAM cask, which included decontamination efforts, surveys, quality control (QC) requirements, and shipment preparations on four occasions during the inspection period.

The inspector observed radiation protection (RP) technicians from Unit 1 and Millstone Waste Services group conduct radiation surveys. The RP technicians utilized the required survey instrumentation that were properly source checked and calibrated, followed the appropriate unit and site procedures for documentation of surveys, and utilized the required Department of Transportation (DOT) placards for shipment off-site, as well as NRC regulatory postings while on-site.

The inspector observed the licensee perform appropriate QC activities to ensure cask integrity, as well as required DOT inspections on the transport vehicle and trailer for selected shipments. In addition, the inspector reviewed various documents, such as the automated work order, shipping documents, and emergency preparedness plans regarding transport accidents and found no significant issues.

c. Conclusions

The licensee's activities regarding the processing and shipment of the TN-RAM cask were conducted appropriately. Four cask shipments were successfully completed.

R2 Status of RP&C Facilities and Equipment

R2.1 Radioactive Source Management

a. Inspection Scope (83750)

The inspector reviewed the licensee's program for control of sealed radioactive sources at Unit 1.

b. Observations and Findings

Two individuals at Millstone Unit 1 are designated as source custodians and are responsible for controlling the sealed radioactive sources listed on the site inventory. The RP Supervisor is the custodian for sources used to check portable instrumentation, and the Unit 1 Instrumentation and Control (I&C) Supervisor is the designated source custodian for sources contained within plant instrumentation, such as process radiation monitors (PRMs) installed in various plant systems.

During removal of abandoned area radiation monitors (ARMs) from Unit 1 structures under the System Evaluation and Re-Characterization Team (SERT) process, various monitors were found to contain radioactive sources. I&C personnel removed the ARMs from their installed location and dismantled the monitors with participation by RP personnel. Eight of the 20 detectors removed from the plant were found to contain radioactive sources. The removed sources were secured by RP personnel for disposal as radwaste.

c. Conclusions

The inspector concluded that radioactive sources identified in abandoned radiation monitors were controlled, with appropriate action taken to minimize personnel exposure to the sources.

R8 Miscellaneous RP&C Issues

R8.1 Radiation Protection Program Deficiencies

a. Inspection Scope (83750)

The inspectors reviewed the licensee's response following the determination that a potentially unauthorized entry into a TS locked HRA had occurred, and that airborne radioactivity area postings were not followed and subsequently improperly de-posted.

b. Observations and Findings

Reactor Building Equipment Drain Tank Event

On March 13, 2000, the licensee identified that a potential violation of a TS locked HRA had occurred during the inspection of the reactor building equipment drain tank (RBEDT) in preparation for insulation removal. A number of lead blankets were installed and secured around the bottom of the RBEDT to minimize dose to personnel and the area was posted as a contaminated boundary and controlled as a HRA. The lead shielding was removed in preparation for work, a general area radiation reading was performed, and a large area smear (LAS) was taken to determine the level of radioactive contamination. However, the LAS was not analyzed prior to personnel entry into the RBEDT area. A worker accessed the lower portion of the RBEDT for approximately 15 - 30 seconds to perform the inspection.

The licensee initiated an independent event review team to perform a root cause investigation to determine whether or not the tank area should have been controlled as a locked HRA and if the work had been properly planned and conducted. The investigation identified "inadequate accountability system" as a root cause, with several contributing causes including "inadequate communications between organizations". The root cause was determined through performance of a barrier analysis that identified a lack of intervention by qualified personnel when radiation protection work practice standards had not been met. The event review team effectively utilized station procedures for the performance of the root cause analysis, with assistance from the Corrective Action department. The licensee's root cause analysis was appropriate to address planned corrective actions, and will be tracked by the corrective action program.

The inspector reviewed the root cause report and noted the following:

- A violation of station procedures occurred when a walkdown or inspection of the RBEDT was performed by workers incorrectly logged in on RWP 101, Task 3 instead of Task 1. Task 3 covered insulation removal, whereas walkdowns and inspections were covered under Task 1.
- A violation of station procedures (RWP 101, Task 1, Attachment II, "ALARA Controls") occurred because the worker who accessed the lower portion of the RBEDT was not briefed concerning the actual level of contamination prior to entry, and therefore was unaware of potential hazards from contamination under the tank.
- A violation of NRC requirements occurred (10 CFR 20.1501(a)(2)(i) and (iii)), where a contamination survey was not performed to determine the magnitude and extent of radiation levels and potential radiological hazards (the LAS had not been analyzed prior to the entry).
- A violation of station procedures occurred because localized drain piping under the RBEDT was identified by RP personnel to have contact dose rates greater than 100 mRem/hr, and was not posted as a "Hot Spot" in accordance with RPM 2.4.1.

- A programmatic weakness was identified in that the RP technician present at the work site did not control activities to prevent a worker from entering the area below the RBEDT. Specifically, the worker placed a portion of the body other than the chest or upper torso into an area with varying dose gradients, without appropriate consideration for placement of external dosimetry on the portion of the body exposed to the highest dose rates (i.e., the head, neck and upper chest).
- The licensee appropriately performed a dose evaluation which included a whole body count of the person who entered the bottom of the RBEDT, a gradient survey to estimate and assess the actual conditions under the tank that was not captured by dosimetry, and a final exposure assignment of 2 mRem whole body dose.

10 CFR 20.1501(a)(2)(i) and (iii), requires in part, that each licensee shall make surveys to evaluate the magnitude and extent of radiation levels and the potential radiological hazards. Contrary to this requirement, the licensee failed to perform a contamination survey prior to the entry of a worker under the reactor building equipment drain tank, in that the extent of contamination levels were not known or evaluated prior to entry. The failure to perform a survey is a violation of NRC requirements and is being treated as a Non-Cited Violation (**NCV 50-245/2000-05-02**), consistent with Section VI.A of the Enforcement Policy, issued on May 1, 2000 (65 FR 25368).

Airborne Radioactivity Area De-Posting Event.

On April 26, 2000, the licensee identified that personnel had (1) entered the Cleanup (C/U) Heat Exchanger Room, which was posted as an airborne radioactivity area, without the required respiratory protection; (2) not adhered to a vendor-controlled sign that required the use of half-face respirators (the sign was used to implement conservative work practices by the insulation removal contractor at Unit 1 following past industrial safety deficiencies); and (3) inappropriately de-posted the airborne radioactivity area without adequate air sample results.

The licensee subsequently formed a root cause evaluation team on May 3, 2000. The inspector reviewed the root cause investigation and noted the following:

- A violation of procedures occurred when insulation removal personnel entered the C/U Heat Exchanger room without complying with the appropriate entry requirements posted at the boundary. Specifically, the area was posted as an "Airborne Radioactivity Area," and RWP 101, Task 3, required the use of full-face respiratory protection for entry.
- A violation of procedures occurred when an "Airborne Radioactivity Area," posted in accordance with U1 RPM 2.4.1, "Posting of Radiological Control Areas," was de-posted based on beta/gamma airborne concentration results only. Specifically, alpha airborne concentration results were greater than 0.3 DAC, a condition in which the procedure required the area to be posted as an "Airborne Radioactivity Area". The alpha radioactivity concentration information was not considered in the decision to de-post the area.
- The root cause was identified to be "inadequate job skills, decision making or work practices". In addition, several contributing causes have been preliminarily identified,

including inadequate program interface requirements, inappropriate direction, and poor self-verification process.

All of the licensee's corrective actions are not completed, however, adequate interim corrective actions were implemented following this event. The interim corrective actions included suspending work to reinforce expectations regarding entry into posted areas, revising the RWP to clarify respiratory protection requirements for entry, and the immediate halting of work until an evaluation of alpha airborne activity levels had been completed. The licensee's preliminary evaluation determined that the maximum airborne activity level associated with licensed materials was 0.58 DAC, lower than the 1 DAC regulatory limit of 10 CFR 20, Appendix B.

c. Conclusions

The licensee's root cause investigations that were initiated following the identification of two radiation protection events were comprehensive, provided good correspondence between the root cause and recommended corrective actions, and appear to adequately address the various human performance and programmatic issues that have been prevalent in the radiation protection program during the inspection period. However, several procedural violations were identified, as well as a non-cited violation regarding the failure to perform a survey.

S1 Conduct of Security and Activities

S1.1 Safeguards Information Mis-Classification

a. Inspection Scope (36801, 81700)

The inspector reviewed the licensee's safeguards classification of documents submitted to the NRC.

b. Observations and Findings

On May 1, 2000, the licensee submitted to the NRC a threat analysis performed by Sandia National Laboratories in support of the proposed security systems at the Millstone site. The analysis documents were transmitted with a safeguards classification of "Unclassified Controlled Nuclear Information (UCNI)." The inspector subsequently identified that the letter was transmitted to the NRC without the appropriate classification of "Safeguards Information", as required by 10 CFR 73.21. Additionally, the inspector determined that licensee security procedures do not address transmittal of safeguards information under a less restrictive security protocol than as "Safeguards Information". However, the inspector found that the material was actually transmitted in a manner consistent with the relevant protections for safeguards information required by NRC regulations, with the exception of the appropriate markings of "safeguards information."

c. Conclusions

The licensee entered the issue into their corrective action program, and the inspector concluded that the failure to properly classify and label safeguards information is considered a minor violation of minor significance that is not subject to enforcement action and is a program weakness.

V. Management Meetings

X1 Meeting Summaries

X1.1 Millstone 1 Decommissioning Advisory Committee

The resident inspector and the Chief, Decommissioning and Laboratory Branch attended the June 1, 2000 meeting of the Millstone 1 Decommissioning Advisory Committee (MIDAC). During the meeting, the Branch Chief provided details regarding the NRC inspection program at Unit 1. The MIDAC is an advisory committee to the State of Connecticut's Nuclear Energy Advisory Council (NEAC), whose purpose is to enhance open communication, public involvement and education in matters relating to the decommissioning of Millstone Unit 1.

X1.2 Exit Meeting

The inspector presented the inspection results to members of licensee management at the conclusion of the inspection on June 22, 2000. The licensee acknowledged the findings presented.

PARTIAL LIST OF PERSONS CONTACTED

Licensee

L. Temple, Unit 1 General Manager
B. Ford, Director, Nuclear Safety and Regulatory Affairs
R. Fraser, Director, Unit 1 Decommissioning
R. Doherty, Manager, Radiation Protection
J. Veglia, Manager, Engineering Decommissioning, Unit 1
W. Axelson, Radiological Engineering
T. Stafford, Radiation Protection Supervisor
J. Allen, Waste Services
F. Neff, Radwaste Operator
F. Teeple, I&C Supervisor
R. Harnal, Project Manager
D. Head, Engineer
S. Thickman, Licensing

INSPECTION PROCEDURES USED

36801	Organization, Management, and Cost Controls at Permanently Shutdown Reactors
37801	Safety Reviews, Design Changes, and Modifications at Permanently Shutdown Reactors
40801	Self-Assessment, Auditing, and Corrective Action Permanently Shutdown Reactors
60801	Spent Fuel Pool Safety at Permanently Shutdown Reactors
62801	Maintenance and Surveillance at Shutdown Reactors
71801	Decommissioning Performance and Status at Permanently Shutdown Reactors
81700	Physical Security Program for Power Reactors
83750	Occupational Radiation Exposure
86750	Solid Radioactive Waste Management Transportation of Radioactive Materials
92700	Onsite Followup of Written Reports of Nonroutine Events at Power Reactor Facilities

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

LER	50-245/2000-01-00	Fuel Pool Level Technical Specification Surveillance Missed
NCV	50-245/2000-05-01	Fuel Pool Level Technical Specification Surveillance Missed
NCV	50-245/2000-05-02	Failure To Perform Contamination Survey

Closed

NCV	50-245/2000-05-01	Fuel Pool Level Technical Specification Surveillance Missed
NCV	50-245/2000-05-02	Failure To Perform Contamination Survey
LER	50-245/2000-01-00	Fuel Pool Level Technical Specification Surveillance Missed
URI	50-245/97-01-03	Inaccurate Personnel Qualification Statements

Discussed

URI	50-336/423/97-01-03	Inaccurate Personnel Qualification Statements
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LIST OF ACRONYMS USED

ALARA	As Low As is Reasonably Achievable
ARMs	Area Radiation Monitors
C/U	Clean Up
CFR	Code of Federal Regulations
CRDM	Control Rod Drive Mechanism
CRs	Condition Reports
DAC	Derived Air Concentration
DOT	Department of Transportation
DSAR	Defueled Safety Analysis Report
HRA	High Radiation Area
I&C	Instrumentation and Calibration
LAS	Large Area Smear
LCO	Limited Condition for Operation
LERs	Licensee Event Reports
MIDAC	Millstone 1 Decommissioning Advisory Committee
MRT	Management Review Team
NCV	Non-Cited Violation
NEAC	Nuclear Energy Advisory Council
NSAB	Nuclear Safety Assessment Board (NSAB)
NUQAP	Northeast Utilities Quality Assurance Program
PDR	Public Document Room
PDTS	Permanently Defueled Technical Specifications
PORC	Plant Operations Review Committee
PRMs	Process Radiation Monitors
QC	Quality Control
RBEDT	Reactor Building Equipment Drain Tank
RD	Reportability Determination
RP	Radiation Protection
RP&C	Radiological Protection and Chemistry
RWP	Radiation Work Permit
SERT	System Evaluation Re-Characterization Team
SFP	Spent Fuel Pool
SR	Surveillance Requirement
SSCs	Structures, Systems and Components
TN-RAM	Trans-Nuclear radioactive material
TS	Technical Specifications
UCNI	Unclassified Controlled Nuclear Information
USC	Underwater Shear Compactor