January 29, 2003

Mr. Peter E. Katz
Vice President - Calvert Cliffs Nuclear Power Plant
Constellation Generation Group, LLC
1650 Calvert Cliffs Parkway
Lusby, Maryland 20657-4702

SUBJECT: CALVERT CLIFFS NUCLEAR POWER PLANT - NRC INTEGRATED INSPECTION REPORT 50-317/02-06, 50-318/02-06, AND 72-8/02-01 AND SUPPLEMENTAL INSPECTION OF WHITE INSPECTION FINDING IN THE AREA OF RADIOACTIVE MATERIAL TRANSPORTATION

Dear Mr. Katz:

On December 28, 2002, the US Nuclear Regulatory Commission (NRC) completed an inspection at your Calvert Cliffs Nuclear Power Plant Units 1 and 2. The enclosed integrated inspection report documents the inspection findings, which were discussed via telephone on January 27, 2003, with Mr. Kevin Neitmann and other members of your staff.

The inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

On the basis of the results of this inspection, no findings of significance were identified. On December 12, 2002, a region-based inspector completed a supplemental inspection (IP 95001) of your activities associated with a WHITE finding in the area of radioactive material transportation.

Since the terrorist attacks on September 11, 2001, the NRC has issued two Orders (dated February 25, 2002, and January 7, 2003) and several threat advisories to licensees of commercial power reactors to strengthen licensee capabilities, improve security force readiness, and enhance access authorization. The NRC also issued Temporary Instruction 2515/148 on August 28, 2002, that provided guidance to inspectors to audit and inspect licensee implementation of the interim compensatory measures (ICMs) required by the February 25th Order. Phase 1 of TI 2515/148 was completed at all commercial nuclear power plants during calendar year (CY) '02, and the remaining inspections are scheduled for completion in CY '03. Additionally, table-top security drills were conducted at several licensees to evaluate the impact of expanded adversary characteristics and the ICMs on licensee protection and mitigative strategies. Information gained and discrepancies identified during the audits and drills were reviewed and dispositioned by the Office of Nuclear Security and Incident Response. For CY '03, the NRC will continue to monitor overall safeguards and security controls, conduct inspections, and resume force-on-force exercises at selected power plants. Should threat conditions change, the NRC may issue additional Orders, advisories, and temporary instructions to ensure adequate safety is being maintained at all commercial power reactors.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of the NRC's document system (ADAMS). ADAMS is accessible from the NRC Web Site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

/RA/

James M. Trapp, Chief
Projects Branch 1
Division of Reactor Projects

Docket Nos.: 50-317, 50-318, 72-8
License Nos.: DPR-53, DPR-69

Enclosure: Inspection Report 50-317/02-06, 50-318/02-06, 72-8/02-01
w/Attachment 1: Supplemental Information
w/Attachment 2: Supplemental Inspection of WHITE Finding in the Area of Radioactive Material Transportation

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U.S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket Nos.:	50-317, 50-318, 72-8
License Nos.:	DPR-53, DPR-69
Report Nos.:	50-317/02-06, 50-318/02-06 and 72-8/02-01
Licensee:	Constellation Generation Group (CGG), Limited Liability Corporation (LLC)
Facility:	Calvert Cliffs Nuclear Power Plant, Units 1 and 2
Location:	1650 Calvert Cliffs Parkway Lusby, Maryland 20657-4702
Dates:	September 29, 2002 - December 28, 2002
Inspectors:	David Beaulieu, Senior Resident Inspector, DRP Robert Berryman, Reactor Inspector, DRS Thomas Burns, Reactor Inspector, DRS John Caruso, Senior Operations Engineer, DRS Antone Cerne, Senior Resident Inspector at Millstone Unit 3, DRP Harold Gray, Senior Reactor Inspector, DRS Shriram Iyer, Reactor Engineer, DRP Jason Jang, Senior Health Physicist, DRS Randall Musser, Senior Resident Inspector at Surry Power Station, DRP Ronald Nimitz, Senior Health Physicist, DRS Tim O'Hara, Reactor Inspector, DRS Neil Perry, Senior Project Engineer, DRP Robert Starkey, Project Manager, NRR Marvin Sykes, DIPM, NRR
Approved by:	James M. Trapp, Chief Reactor Projects Branch 1 Division of Reactor Projects

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SUMMARY OF FINDINGS

IR 05000317-02-06, 05000318-02-06, 07200008-02-01; Calvert Cliffs Nuclear Plant; on 09/29 - 12/28/2002; Calvert Cliffs Nuclear Power Plant, Units 1 & 2. Resident Inspector Report.

The inspection was conducted by resident inspectors, senior health physicists, regional and headquarters specialist inspectors. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 3, dated July 2000.

A. Inspector Identified Findings

Cornerstone: Public Radiation Safety

A supplemental inspection was performed by the NRC to assess Constellation Generation's evaluations and corrective actions associated with a WHITE finding involving identification of elevated radiation dose rates on a package of radioactive material shipped from the Calvert Cliffs facility on May 23, 2002, to a waste processing facility (Reference EA-02-138, NRC Report No. 50-317/02-04; 50-318/02-04, dated August 19, 2002). A previous supplemental inspection, conducted in October 2002, to verify that the causes of the performance issues associated with this finding were understood, the extent of condition had been identified, and that corrective actions were sufficient to prevent recurrence, was unable to assure that the extent of condition of risk significant performance issues had been identified or that the corrective actions taken or planned were sufficient to address the issues as required by the inspection objectives outlined in NRC Inspection Procedure 95001, "Inspection for One or Two White Inputs in a Strategic Performance Area," (Reference NRC Inspection Report No. 50-317/02-011; 50-318/02-011, dated November 7, 2002). The current inspection identified that Constellation Generation conducted a detailed Collective Significance Analysis of this matter, identified root and contributing causes, and identified and implemented corrective actions to address these causes and prevent recurrence. The inspection also identified actions had been taken to improve the corrective action process including root cause analyses. Consistent with NRC Inspection Manual Chapter (IMC) 0305, "Operating Reactor Assessment Program," this issue will only be considered in assessing plant performance for a total of four quarters from the date when the issue was identified (May 28, 2002). (Attachment 2)

REPORT DETAILS

Summary of Plant Status Units 1 and 2 operated at or near 100 percent power for the entire inspection period, except for a five day period beginning November 18, 2002, when Unit 1 was shut down to replace a seal in the 11 reactor coolant pump.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R01 Adverse Weather Protection

a. Inspection Scope

The inspector evaluated licensee equipment and procedures for ensuring that safety-related systems and equipment including the condensate storage tanks, refueling water storage tanks, and fuel oil storage tanks would remain available when challenged by cold weather and freezing conditions. The inspector reviewed the updated final safety analysis report, individual plant examination of external events, technical specifications, and Operations Administrative Policy 92-09, "Cold Weather Operations," for cold weather operation requirements. To verify implementation of these requirements, the inspectors also reviewed the licensee's documentation for completion of Operations Performance Evaluation, PE 0-102-4-O-M, Revision 7, "Freeze Protected Equipment," performed on October 11, 2002.

b. Findings

No findings of significance were identified.

1R02 Evaluations of Changes, Tests, or Experiments

a. Inspection Scope

The inspectors reviewed samples of safety evaluations for the initiating events, barrier integrity, and mitigating systems cornerstones to verify that changes and tests were reviewed and documented in accordance with 10 CFR 50.59, "Changes, Tests, and Experiments," and when required, prior NRC approval was obtained prior to implementation of the change. The sample included safety evaluations for design change packages, engineering calculations, and updated final safety analysis report (UFSAR) changes. The inspectors assessed the adequacy of the safety evaluations through interviews with the cognizant plant staff and by reviewing supporting information such as calculations, engineering analyses, design change documentation, the UFSAR, and plant drawings. In addition, the inspectors reviewed the administrative procedures that control the screening, preparation, and issuance of the safety evaluations to ensure the procedures adequately implemented the requirements of 10 CFR 50.59. A 10 CFR 50.59 refresher training course was monitored which allowed inspectors to evaluate whether resolutions to previously identified problems with evaluations were incorporated into the training.

The inspectors also evaluated the licensee's screening process by reviewing a sample of changes that the licensee determined were outside of the scope of 10 CFR 50.59 and therefore, did not require a full safety evaluation. The inspectors performed this review to assess that the licensee's conclusions with respect to 10 CFR 50.59 applicability were

appropriate. The sample of issues that were screened out included design changes, temporary alterations, procedure changes, and setpoint changes.

The inspectors also reviewed issues that had been entered into the corrective action program to evaluate the licensee's effectiveness in identifying problems associated with the 10 CFR 50.59 safety evaluation process. The inspectors reviewed a sample of these issues to assess the adequacy and the implementation of the specified corrective actions.

The safety evaluations and screenings were selected based on the safety significance of the affected structures, systems, and components. A listing of the safety evaluations, safety evaluation screens, and other documents reviewed is provided in Attachment 1.

b. Findings

No findings of significance were identified.

1R04 Equipment Alignment

.1 Partial Walkdown

a. Inspection Scope

The inspectors conducted an equipment alignment partial walkdown to evaluate the operability of a selected train while the redundant train was inoperable. The walkdown included a review of system operating instructions to determine correct system lineup and verification of critical components to identify any discrepancies that could affect operability of the redundant train. The inspectors performed partial system walkdowns on the following systems:

- 11 and 13 high pressure safety injection (HPSI) train components were inspected on October 22, 2002, while 12 HPSI components were out of service for planned maintenance.
- 23 component cooling train components were inspected on December 18, 2002, while the 22 component cooling pump was out of service for planned maintenance.
- 21 and 23 saltwater train components were inspected on December 19, 2002, while 22 saltwater pump was out of service for planned maintenance and breaker replacement.

The inspectors reviewed the following Calvert Cliffs Nuclear Power Plant documentation:

- Operating Instruction OI-3A-1, “Safety Injection and Containment Spray”
- Operating Instruction OI-16-2, “Component Cooling System”
- Operating Instruction OI-29-2, “Saltwater System”

b. Findings

No findings of significance were identified.

.2 Complete Walkdown

a. Inspection Scope

The inspectors performed a complete walkdown of a risk-important mitigating system, the Unit 2 auxiliary feedwater system, to identify any discrepancies between the existing equipment lineup and the required lineup. During the walkdown, Operating Instruction OI-32A-2, “Auxiliary Feedwater System,” and associated drawings were used to verify that electrical power was available as required; major system components were correctly labeled, lubricated, cooled, and ventilated; hangers and supports were correctly installed and functional; essential support systems were operational; and ancillary equipment and debris did not interfere with system performance. The inspectors reviewed open maintenance work requests on the system for any deficiency that could affect the ability of the system to perform its function. Documentation associated with unresolved design issues such as temporary modifications, operator workarounds, and items tracked by plant engineering were also reviewed to assess their collective impact on system operation.

b. Findings

No findings of significance were identified.

1R05 Fire Protection

.1 Fire Area Tours

a. Inspection Scope

The inspectors conducted tours of areas important to reactor safety to evaluate conditions related to: (1) licensee control of transient combustibles and ignition sources; (2) the material condition, operational status, and operational lineup of fire protection systems, equipment and features; and (3) the fire barriers used to prevent fire damage or fire propagation. The inspectors used procedure SA-1-100, “Fire Prevention,” during the conduct of this inspection.

The areas inspected included:

- Unit 1 Auxiliary Feedwater Pump Room
- Unit 2 Auxiliary Feedwater Pump Room
- Unit 1 Service Water Pump Room
- Unit 2, Facility 1, Emergency Core Cooling Water System Pump Room
- Unit 1 27' Switchgear Room

b. Findings

No findings of significance were identified.

.2 Fire Brigade Drill

a. Inspection Scope

The inspector observed a fire brigade drill conducted on December 9, 2002, involving a simulated fire in the Unit 2 Auxiliary Building Hot Shop, inside the radiologically controlled area. The inspector reviewed Fire Drill Scenario 95-04, and procedure SA-1-100, "Fire Prevention," Attachment 5, Fire Brigade Drill Observation Sheet, to ensure drill objectives were specified and met. The inspector evaluated the readiness of the brigade to prevent and fight fires by observing the following: protective clothing properly donned; self-contained breathing apparatus equipment properly worn; fire hose lines properly laid out and capable of reaching all necessary fire hazard locations; fire area of concern entered in a controlled manner; sufficient fire fighting equipment brought to the scene; fire brigade leader's directions were thorough, clear, and effective; brigade checked for victims and propagation of fire into other areas; effective smoke removal operations simulated; and the drill was pre-planned, followed, and objectives and critical items were met. Additionally, the inspector attended the post-drill critique.

b. Findings

No findings of significance were identified.

1R06 Flood Protection Measures

a. Inspection Scope

The inspectors reviewed licensee flood protection systems and measures established to minimize the impact of postulated floods in Units 1 and 2 due to pipe ruptures and natural occurrences. Two internal plant areas were evaluated to ensure that appropriate barriers were available to protect safety-related equipment. Water tight doors, floor drains, penetrations, level alarm circuits, and drainage systems were verified to be functional. In addition, the inspectors evaluated mitigation strategies and reviewed abnormal and emergency operating procedures for responding to risk-significant flooding scenarios. The two internal plant areas inspected were:

- Units 1 and 2 Service Water Pump Rooms
- Units 1 and 2, Facility 1 and 2, Emergency Core Cooling System Pump Rooms

The inspector also evaluated the vulnerability of safety-related equipment and the potential loss of safety functions due to external flooding at the site. Plant design documentation describes that the loss of a safety function was considered unlikely due to the high site grade and site topography. The inspector confirmed the licensee's assessment by reviewing the maximum height of a storm surge reflected in design documentation and verified the elevation of key plant equipment.

b. Findings

No findings of significance were identified.

1R07 Heat Sink Performance

a. Inspection Scope

The inspector reviewed data from the most recent performance tests for component cooling heat exchangers 11, 12, 21, and 22, to determine whether the heat exchangers were capable of removing design basis heat loads as described in the UFSAR. The inspector also reviewed with system engineers the licensee's program for routine inspection and cleaning of the component cooling heat exchangers.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification Program

.1 Inspection of Simulator Scenarios and Critique

a. Inspection Scope

The inspectors reviewed licensed operator requalification classroom activities on December 12, 2002, to assess the licensee's training program effectiveness. Additionally, the inspectors reviewed the simulator exercises, which were held earlier in the week, and attended the licensee's critique of the simulator exercises on December 12, 2002. Specifically, the inspectors examined the simulator scenarios, the critical tasks being evaluated, and the performance review conducted by an instructor. The inspectors verified that the identified critical tasks were met and reviewed.

b. Findings

No findings of significance were identified.

.2 Licensed Operator Requalification Biennial Testing Cycle Exam Results

a. Inspection Scope

A review was conducted of licensee requalification exam results for the biennial testing cycle. The inspection assessed whether pass rates were consistent with the guidance of NUREG-1021, Revision 8, "Operator Licensing Examination Standards for Power Reactors," and NRC Manual Chapter 0609, Appendix I, "Operator Requalification Human Performance Significance Determination Process."

The inspector verified that:

- Crew pass rate was greater than 80%. (Pass rate was 90.9%.)
- Individual pass rate on the dynamic simulator test was greater than or equal to 80%. (Pass rate was 96.6%.)
- Individual pass rate on the comprehensive biennial written exam was greater than 80%. (Not administered this year.)
- Individual pass rate on the walk-through job performance measures was greater than 80%. (Pass rate was 97%.)
- More than 75% of the individuals passed all portions of the exam. (96.6% of the individuals passed all portions of the exam.)

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness

a. Inspection Scope

The inspector reviewed the licensee's implementation of 10 CFR 50.65 (a)(3), which requires a periodic evaluation to verify appropriate maintenance rule scoping of structures, systems and components (SSCs) and to verify that adequate consideration was given to the balancing of reliability and unavailability of significant safety equipment. The inspector reviewed the licensee's most recent periodic evaluation report for Units 1 and 2 which covered the interval from October 2000 through September 2002. The inspector verified that the periodic evaluation was completed within the required two year time period.

The inspector selected the following Unit 1 (a)(1) systems for detailed review:

- Auxiliary Feedwater (AFW)
- Feedwater (FW)
- Reactor Coolant System (RCS)

Unit 2 (a)(1) systems selected for detailed review were:

- Auxiliary Feedwater (AFW)
- Containment Spray (CS)
- Containment Isolation (CI)
- Reactor Coolant System (RCS)

The inspector verified: (1) goals and performance criteria were appropriate, (2) industry operating experience was considered, (3) problem identification and resolution of maintenance rule-related issues were addressed, (4) corrective action plans were effective, and (5) performance was being effectively monitored. The inspector verified that adjustments were made in action plans for SSCs in (a)(1) status as a result of the licensee's review of system performance against established goals. As of September 30, 2002, twelve (12) SSCs at Unit 1 and eleven (11) at Unit 2 were in (a)(1) status. Eight of these systems were risk significant. These eight systems were in various stages of evaluation, monitoring, and corrective action. The inspector reviewed documentation for a sample of high safety significant SSCs to verify that the licensee balanced reliability and unavailability and adjusted (a)(1) goals as necessary. The inspector reviewed availability/unavailability tracking and trending data for the RCS at Unit 1, and the AFW and CS at Unit 2.

The inspector selected a sample of high safety significant SSCs that were in a(2) status to verify that the licensee had established appropriate performance criteria. The inspector also verified that the licensee examined SSCs that failed to meet their performance criteria and whether the failure was a repetitive maintenance preventable functional failure. The inspector verified that reviews were performed to determine the cause of the failure and whether or not the SSC required (a)(1) goal setting and monitoring.

The inspector reviewed documentation for a sample of systems that the licensee had changed from (a)(1) status to (a)(2) status during the periodic assessment period. The inspector selected the RCS for Unit 1, and the AFW and CS systems for Unit 2 to verify that (a)(1) goals had been appropriately met prior to returning the systems to (a)(2) status.

In addition, the inspector verified that the licensee had established and implemented a preventive maintenance program to manage preventive maintenance activities for systems in both (a)(1) and (a)(2) status. A sample of risk significant systems in (a)(1) and (a)(2) status was reviewed to verify the performance of condition monitoring and scheduled maintenance.

b. Findings

No findings of significance were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control

a. Inspection Scope

The maintenance orders (MO) listed below were selected from emergent work activities performed by the licensee's "fix it now" (FIN) team and from other unplanned activities. The inspectors verified: (1) risk assessments were performed in accordance with Calvert Cliffs procedure NO-1-117, "Integrated Risk Management"; (2) risk of scheduled work was managed through the use of compensatory actions; and (3) applicable contingency plans were properly identified in the integrated work schedule.

- MO2200203443 On August 29, 2002, the 21 condensate pump oil pump coupling was identified as broken, rendering the pump inoperable.
- MO1200204565 On September 25, 2002, engineered safety feature actuation system channel ZG block module was fluctuating and was removed from service for maintenance.
- MO1200204474 On September 11, 2002, the 12B service water heat exchanger was taken out of service due to failure of the heat exchanger flushing circuit.
- MO2200203146 On August 16, 2002, the 22 switchgear room compressor failed to run after start and was removed from service for maintenance.
- MO2200203441 On September 30, 2002, the Unit 2 Auxiliary Feedwater Pump Room air conditioning unit was identified as blowing warm air and corrective maintenance was performed.

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations

a. Inspection Scope

The inspectors reviewed operability determinations to assess the correctness of the evaluations, the use and control of compensatory measures if needed, and compliance with technical specifications. The inspector's review included a verification that the operability determinations were made as specified by the licensee's procedure NO-1-106, "Functional Evaluations/Operability Determination." The technical adequacy of the determinations was reviewed and compared to technical specifications, the UFSAR, and associated design basis documents. The following evaluations were reviewed:

- Operability Determination No. 02-011: Addresses the operability of the 11 and 13 Charging Pumps with the 12 Charging Pump having a degraded discharge check valve, 1-CVC-171.

- A licensee assessment of service water system operability after they found that service water was leaking into the saltwater system through a service water heat exchanger at a rate of 9 gallons per minute. The inspectors reviewed procedure OI-15, "Service Water System," and Design Calculation CA03837, "Makeup Water Flow Rate from the Salt Water System to the Service Water System," which describe that the service water system can be considered operable with a leakage rate less than 16.3 gallon per minute because there would be sufficient time to connect a temporary hose from the saltwater system to provide makeup.

- Operability Determination No. 02-001: Addresses the electrical failure of three containment air coolers. The failures involved different failure modes and were separate and independent events.

- Operability Determination No. 02-008: Addresses a seismic monitoring system failed accelerometer in the auxiliary building basement.

- Based on the configuration of the four support legs for the service water head tank, the inspector evaluated the ability of the tank to withstand a seismic event. The inspector reviewed drawing number FSK-C-184, "Foundation Pad Service Water Head Tank," and Calculation C-013, dated March, 26, 1995.

b. Findings

No findings of significance were identified.

1R16 Operator Workarounds

a. Inspection Scope

During this inspection period the inspectors reviewed the licensee's list of identified operator workarounds for both units, dated November 1, 2002, to determine whether any identified workarounds affected either the functional capability of the related system or human reliability in responding to an event. Additionally, the inspectors looked for any combined effects of the operator workarounds.

b. Findings

No findings of significance were identified.

1R17 Permanent Plant Modifications

.1 Review of Risk Significant On-line Modification

a. Inspection Scope

The inspectors reviewed a permanent plant modification to the wide range nuclear instrumentation. The wide range nuclear instruments provide indication of reactor power and a reactor trip signal. The modification involved installation of hand switches to block test signals from the control room. It was determined that a fire in the main control room could cause a short, disabling the instrument's indication at the remote shutdown panel. The switches would be used after operations personnel evacuated the main control room due to a fire. The inspector reviewed the modification packages for both wide range instruments for Units 1 and 2 (ES200200047) and the maintenance work orders (MO1200200931, MO1200200932, MO2200201706, and MO2200201707) to verify that components were compatible, equipment locations were appropriate, circuitry was not adversely affected, operating procedures were changed as necessary, the engineering safety evaluation was in accordance with procedures and 10 CFR 50.59, and the post-modification testing was appropriate and performed in accordance with procedures and the work orders. Additionally, the inspectors discussed the modification with engineering and operations personnel, and walked down the modification and related indications with plant personnel.

b. Findings

No findings of significance were identified.

.2 Biannual Review of Permanent Plant Modifications

a. Inspection Scope

The inspectors reviewed selected permanent plant modification packages, calculations, set-point changes and engineering evaluations to verify that the design bases, licensing bases, and performance capability of risk significant structures, systems, and components (SSCs) have not been degraded through plant modifications.

Plant changes were selected for review based on risk insights for the plant and included SSCs associated with the initiating events, barrier integrity, and mitigating systems cornerstones. The inspection included walkdowns of selected plant systems and components, interviews with plant staff, and the review of applicable documents including procedures, calculations, modification packages, engineering evaluations, drawings, corrective action documents, the UFSAR, technical specifications, and system design basis documents.

The inspectors verified that selected attributes were consistent with the design and licensing bases. These attributes included component safety classification, energy requirements supplied by supporting systems, seismic qualification, instrument set-points, uncertainty calculations, electrical coordination, electrical loads analysis, and equipment environmental qualification. Design assumptions were reviewed to verify that they were technically appropriate and consistent with the UFSAR. For each modification, the 50.59 screenings or evaluations were reviewed as described in Section 1R02 of this report. The inspectors verified that procedures, design basis documents, and the UFSAR were properly updated with revised design information and operating guidance. The inspectors also verified that the as-built configuration was accurately reflected in the design documentation and that post-modification testing was adequate to ensure the SSCs would function properly.

The inspectors also reviewed issues that had been entered into the corrective action program to determine if the licensee had been effective in identifying problems associated with the plant modification process and activities. A sample of these issues was selected for further review during which the inspectors assessed the adequacy of the corrective actions which had been implemented for the selected issues. A listing of documents reviewed is provided in Attachment 1.

b. Findings

No findings of significance were identified.

1R19 Post Maintenance Testing

a. Inspection Scope

The inspectors reviewed post maintenance test procedures and associated testing activities for selected risk significant mitigating systems to assess whether: (1) the effect of testing on the plant had been adequately addressed by control room and engineering personnel; (2) testing was adequate for the maintenance performed; (3) acceptance criteria were clear and adequately demonstrated operational readiness, consistent with design and licensing basis documents; (4) test instrumentation had current calibrations, range, and accuracy for the application; (5) tests were performed, as written, with applicable prerequisites satisfied; and (6) that equipment was returned to the status required to perform its safety function. The following maintenance orders were reviewed:

- MO1199705103, Replace breaker 152-1408 for 12 high pressure safety injection (HPSI) with a new vacuum breaker. New breaker tested utilizing procedure ETP 98-065, “4kV Vacuum Breaker Functional Test for 152-1408, 12 HPSI Pump.”

- MO2200202112, Perform vibration and temperature monitoring of 12 control room heating ventilation and air conditioning fan motor, which was removed and replaced after the addition of a structural support.

- MO1200203315, Safety injection motor operated valve 1-SI-655 has boric acid buildup around stem and packing nut; tighten packing. The inspector evaluated the need to measure valve thrust following packing adjustment.

- MO1200204882, Positioner for control valve 1CV4021 did not allow valve to fully close; replace positioner. Valve stoked open and fully closed with new positioner.

- MO2200203146, 22 switchgear heating ventilation and air conditioning compressor not loading properly. Broken lead that was found and reconnected. Compressor ran and loaded properly for three hour test run.

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing

a. Inspection Scope

The inspectors witnessed performance of surveillance test procedures and reviewed test data of selected risk-significant structures, systems, and components (SSCs) to assess whether the SSCs satisfied technical specifications, UFSAR, technical requirements manual, and licensee procedure requirements. The inspectors assessed whether the testing appropriately demonstrated that the SSCs were operationally ready and capable of performing their intended safety functions. The following tests were witnessed:

- STP-M-213-1, “Calibration of Power Range Nuclear Instrumentation by Comparison with Incore Nuclear Instrumentation”
- STP-M-212E-2, “Reactor Protection System Matrix Functional Test”
- STP-M-200-1, “Reactor Trip Circuit Breaker Functional Test”
- STP F-591-2, “Fire Barrier Penetration Testing”
- STP O-65J-1, “Safety Injection Check Valve Quarterly Operability Test”

b. Findings

Inspector concerns regarding the performance of procedure STP O-65J-1 are documented in Section 4OA2 of this report.

1R23 Temporary Plant Modifications

a. Inspection Scope

The inspectors reviewed the temporary modifications list below to assess: (1) the adequacy of the 10 CFR 50.59 evaluation; (2) that the installation was consistent with the modification documentation; (3) that drawings and procedures were updated as applicable; and (4) the adequacy of the post-installation testing.

- Temporary Alteration 1-02-0042, jumpered the reactor vessel level measurement system (RVLMS) 19" electronics to the 29" electronics to suppress the error codes and alarms associated with the 19" electronics and to maintain Channel A RVLMS operable.

- Temporary Alteration 2-02-0002, replaced the analog controller for the pressurizer spray valves with a digital controller which provides automatic

function capability for pressurizer spray valves, 2CV100E and 2CV100F. The temporary alteration will be restored to the original plant configuration when vendor-recommended shielded wiring on the input and output signal wires is installed during the next refueling outage.

- Temporary Alteration 2-1-0039, allowed the reactor coolant system hot leg temperature detector, 2-TE-122HB, which was degraded, to be disabled and removed from the reactor protection system circuit.

b. Findings

No findings of significance were identified.

2. RADIATION SAFETY

Cornerstone: Public Radiation Safety

2OS1 Access Control to Radiologically Significant Areas

a. Inspection Scope

The inspector conducted the following activities and reviewed the following documents to determine the effectiveness of radiological controls, including access controls to radiologically significant areas.

The inspector reviewed and discussed occupational radiation protection performance for calendar year 2002. In particular, the inspector reviewed and discussed maximum occupational worker doses including deep and shallow doses and doses attributable to intakes of airborne radioactive materials. The reviews included causes and corrective actions, as appropriate. Also reviewed were doses and exposure controls for declared pregnant workers.

- The inspector toured portions of Unit 1 and 2 Auxiliary Buildings and reviewed access controls to locked High Radiation Areas. Selected locked High Radiation Area access points were physically inspected to determine if access controls were sufficient to preclude unauthorized entry, as appropriate. The inspector conducted an inventory of locked High Radiation Area keys and reviewed the administrative controls for access areas to locked High Radiation Areas. Also reviewed were access and egress control to the radiological controlled area (RCA) including personnel monitoring practices to detect personnel contamination during RCA egress.

- The inspector reviewed the adequacy and effectiveness of radiological controls provided and accrued occupational radiation doses sustained during forced outage work in November 2002 on a Unit 1 reactor coolant pump seal.

- The inspector reviewed radiological controls for new fuel inspection.

The reviews in this area were against criteria contained in 10 CFR 20 and applicable radiation protection procedures.

b. Findings

No findings of significance were identified.

2OS2 ALARA Planning and Controls

a. Inspection Scope

The inspector selectively reviewed the adequacy and effectiveness of the program to reduce occupational radiation exposure to as low as is reasonably achievable (ALARA). Specifically, the inspector reviewed the planning and preparation for the upcoming Unit 2 refueling outage. The review was against criteria contained in 10 CFR 20 and applicable licensee procedures. The following matters were reviewed: the current status of outage radiological work planning for non-steam generator replacement aspects of the refueling outage; principal exposure reduction efforts to be implemented; the radiological risk classification efforts of selected planned activities; and implementation of lessons learned. Also reviewed was planning for outage tasks with projected exposure possibly greater than 5 person-rem including radiation safety, maintenance activities, scaffolding, reactor assembly and disassembly, and reactor vessel head work.

b. Findings

No findings of significance were identified.

2OS3 Radiation Monitoring Instrumentation

a. Inspection Scope

The inspector reviewed the use, calibration, and source checking of selected hand-held and stationary instruments used for radiological control purposes. The inspector focused on radiation survey and monitoring instruments used for risk significant radiological work tasks and job coverage. The inspector also reviewed periodic calibration of radiation sources used to calibrate its instrumentation including traceability of source calibration. The review included determination that applicable in-plant source terms were evaluated relative to adequacy of radiation sources used for calibration purposes. The instruments and equipment reviewed were:

- RO-2 (4764), RM-14(5220), E-600 (100CGS)(alpha/beta(#1122), Handcount(102). (Instruments used to support miscellaneous waste tank entry work)
- Ludlum Model 12 (NRD) (83378), teletector (37382) (Instruments used for reactor containment entry at 100% power)
- Air sampler Model HD-29 (5276), RO-20 (3199) (Instruments used to support reactor cavity entry)
- AMS-4 stationary air sampler (1440), Buck sample pump (60442)
- Instrument Calibrator (Model 89) (8189)

The inspector also reviewed the maintenance and surveillance of self-contained breathing apparatus (SCBA). The following aspects were reviewed:

- The status and surveillance records for self-contained breathing apparatus (SCBA) staged and ready for use in the station (SCBA Unit Nos. 322, 142, 291, 717);
- the licensee's capability for refilling and transporting SCBA bottles to and from the control room and operations support center in emergency conditions;
- the training and qualifications of personnel assigned to refill SCBA bottles;
- the training and qualification of control room operators, chemistry personnel, radiation protection personnel and other selected emergency response personnel in the use of SCBA, including bottle change-out;
- personnel qualification documentation for onsite personnel designated to perform maintenance including inspection, testing, repair, and overhaul of vendor designated vital components of SCBA;
- the periodic air cylinder hydrostatic testing data to verify testing was completed, documented, and up-to-date including the status of DOT required retest air cylinder markings;
- flow testing of breathing regulators; and
- onsite SCBA maintenance procedures to identify apparent inconsistencies between the licensee's procedures and the SCBA manufacturer's recommended practices including the low-pressure alarm and air regulator procedure.

The reviews in this area were against applicable station procedures, 10 CFR 20, and the following specific references:

- Regulatory Guide 8.15, Revision 1, "Acceptable Programs for Respiratory Protection."
- NUREG 0041, Revision 1, "Manual of Respiratory Protection Against Airborne Radioactive Material."

b. Findings

No findings of significance were identified.

2PS3.1 Radiological Environmental Monitoring Program

a. Inspection Scope

The inspector reviewed the following documents to ensure that the licensee met the requirements specified in the Improved Technical Specification/Offsite Dose Calculation Manual (ITS/ODCM):

At the Calvert Cliffs Site

- 2000 and 2001 Annual Radiological Environmental Operating Report required by Section 5.6.2 of the ITS, including projected public doses (required by 40 CFR 190) around the interim spent resin storage area;
- most recent ODCM (Revision 6, March 23, 2002) for the radiological environmental monitoring program (REMP) portion and technical justifications for ODCM (REMP portion) changes, including sampling locations, if any;
- the most recent calibration results of the primary and the backup meteorological monitoring instruments for wind direction, wind speed, and delta temperature;
- implementation of the instrument accuracy contained in Safety Guide 23, Onsite Meteorological Programs (wind direction ±5°; wind speed ±0.5 mph; and temperature ±0.5°C);
- availability of the meteorological monitoring instruments from January 1, 2002, to June 30, 2002;
- 2002 Quality Assurance Audit 02-AR-03-OPSAU, performed August 19-22, 2002, for the REMP/ODCM implementation; and
- land use census procedure, and the 2001 and 2002 results and associated procedures.

At the Fort Smallwood Laboratory

- most recent calibration results for all TS/ODCM required air samplers;
- selected 2002 analytical results for selected REMP media;
- implementation of the quality assurance and quality control program for the contract laboratories, including the interlaboratory comparison program;
- associated analytical procedures; and
- implementation of the routine environmental thermoluminescent dosimeters (TLDs) program.

The inspector also toured various areas and observed the following activities to evaluate the effectiveness of the licensee's REMP:

- walkdown for the independent spent fuel storage installation (ISFSI) sampling stations (TLDs, air samplers, and pressurized ion chambers) to determine the equipment material condition;
- walkdown for the interim resin storage area to review the radiological controls for the public and TLD stations;
- walkdown for the meteorological monitoring tower to review the operability; and

- walkdown for determining whether air samplers, composite water sampler, milk/bread leaf vegetation, and TLDs were located as described in the ODCM and for determining the equipment material condition.

b. Findings

No findings of significance were identified.

2PS3.2 Radioactive Material Control Program

a. Inspection Scope

The inspector reviewed the following documents and observed licensee activities to ensure that the licensee's surveys and controls were adequate to prevent the inadvertent release of licensed material to the public domain:

- the methods used for control, survey, and release from the Radiologically Controlled Area (RCA);
- the most recent calibration results for the radiation monitoring instrumentation (small articles monitor, SAM-9), including the (a) alarm setting, (b) response to the alarm, (c) the sensitivity, and (d) alarm failure rate at the alarm set-point;
- the use of SAM-9 by employees and contractors;
- the most recent calibration results for the gamma measurement system;
- the licensee's criteria for the survey and release of potentially contaminated material; and
- associated procedures and records to verify for the lower limits of detection.

The review was against criteria contained in: (1) NRC Circular 81-07, "Control of Radioactively Contaminated Material"; (2) NRC Information Notice 85-92, "Surveys of Waste before Disposal from Nuclear Reactor Facilities"; (3) NUREG/CR-5569, "Health Position Data Base (Positions 221 and 250)"; and (4) the licensee's procedures.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification

.1 RETS/ODCM Radiological Effluent Occurrences

a. Inspection Scope

The implementation of the RETS/ODCM Radiological Effluent Occurrences Performance Indicator (PI) Program was reviewed. Specifically, the inspector reviewed the following documents to ensure the licensee met all requirements of the PI from the third quarter 2001 to the second quarter 2002 (4 quarters):

- monthly projected dose assessment results due to radioactive liquid and gaseous effluent releases;
- quarterly projected dose assessment results due to radioactive liquid and gaseous effluent releases;
- selected issue reports and corrective actions; and
- associated procedures.

b. Findings

No findings of significance were identified.

.2 Units 1 and 2 Heat Removal System Unavailability

a. Inspection Scope

The inspectors reviewed PI data for the Mitigating Systems Cornerstone, Heat Removal System Unavailability, for Units 1 and 2, to verify individual PI accuracy and completeness. This inspection examined data and plant records for third quarter 2002, including a review of PI Data Summary Reports, Licensee Event Reports, operator narrative logs, and maintenance rule records. The review was against the applicable criteria specified in NEI 99-02, Regulatory Assessment Performance Indicator Guideline, Revision 2.

b. Findings

No findings of significance were identified.

.3 Reactor Coolant System Leakage

a. Inspection Scope

The inspectors reviewed PI data for the Barrier Integrity Cornerstone, Reactor Coolant System Leakage, for Units 1 and 2, to verify individual PI accuracy and completeness. This inspection examined data and plant records for third quarter 2002, including a review of PI Data Summary Reports, operator narrative logs, and daily plant of the day

records. The review was against the applicable criteria specified in NEI 99-02, Regulatory Assessment Performance Indicator Guideline, Revision 2.

b. Findings

No findings of significance were identified.

.4 Occupational Exposure Control Effectiveness

a. Inspection Scope

The implementation of the Occupational Exposure Control Effectiveness PI Program was reviewed. Specifically, the inspector reviewed corrective action program records for occurrences involving High Radiation Areas, Very High Radiation Areas, and unplanned personnel radiation exposures since the last inspection in this area. The review was against the applicable criteria specified in NEI 99-02, Regulatory Assessment Performance Indicator Guideline, Revision 2. The purpose of this review was to verify that occurrences that met NEI criteria were recognized and identified as performance indicators.

b. Findings

No findings of significance were identified.

4OA2 Identification and Resolution of Problems

.1 Corrective Actions for Selected Issue Reports

a. Inspection Scope

The inspector reviewed the corrective actions associated with the following issue reports to evaluate the effectiveness of the licensee's problem identification and resolution process:

- Implementation of the routine radiological environmental monitoring program (Issue Report IR3-007-898); and
- Meteorological Monitoring Program (Issue Reports IR3-081-422, IR3-076-613, IR3-062-218, IR3-061-823, and IR3-061-788.)
- 10 CFR 50.59 and Plant Modification Issues (Issue Reports IR3 -049-489, IR3-072-832, IR3-072-833, IR4-006-211, IR4-006-304.)
- Issue Reports related to Maintenance Rule and 10 CFR 50.59 are listed in Attachment 1 of this report.

b. Findings

No findings of significance were identified.

.2 Annual Sample Review - Determining Releases Following Steam Generator Tube Rupture

a. Inspection Scope

The inspector reviewed Issue Report IR3-051-557, dated June 27, 2000, that was associated with the process for determining radioactive releases to the atmosphere through the main turbine gland seal exhauster in the event of excessive primary to secondary leakage or following a steam generator tube rupture event. The issue report recommended that design considerations be reviewed, release paths be evaluated, and procedure and process changes be proposed to evaluate the release path.

The inspector reviewed the issue report resolution document, the system description for the gland seal exhauster, and applicable process diagrams. The inspector also met with licensee chemistry personnel to review the issue report and validate the conclusions reached regarding the significance of this issue. The inspector also assessed the need for process or procedure changes to evaluate the potential releases to the atmosphere, as appropriate.

b. Findings

The issue report evaluation concluded that, under current fuel conditions and steam generator leakage at the time of the evaluation, doses due to gaseous releases from the gland seal exhauster were insignificant. The evaluation also concluded that dose from releases, under maximum allowable fuel and steam generator leakage, would also be within regulatory limits. The evaluation concluded no further action was required. The issue report resolution document was approved on February 7, 2001.

Notwithstanding the above conclusions, the inspector was not able, with the assistance of chemistry personnel, to validate the conclusions contained within the issue report resolution document. The inspector was not able to independently validate the source of some data on system performance identified within the evaluation to support release calculations. Specifically, the inspector was not able to identify the source of release rates for the licensee's evaluation of normal plant conditions. Also, the inspector was not able to identify calculations or technical bases supporting the conclusion that releases would be within regulatory limits under maximum allowable fuel and steam generator leakage. In addition, although the issue report indicated that this issue may apply to other release points identified in Chapter 11 of the Updated Final Safety Analysis Report, the inspector could not identify an extent of condition review or disposition of this matter. The licensee initiated a review of the questions identified by the inspector and initiated actions to clarify the analysis supporting the conclusions. This issue is considered an unresolved item pending further review. **(URI 50-317; 50-318/2002-06-01)**

.3 Annual Sample - Safety Injection Check Valve Testing

a. Inspection Scope

The inspector performed a review of the licensee's resolution to Issue Report IR3-061-844, which involved the performance of check valve seat leak testing on safety injection check valve 1-SI-138-CHV, (IR issued on June 16, 2002). The check valve was tested using procedure STP O-65J-1, "Safety Injection Check Valve Quarterly Operability Testing," Revision 13. The test is performed by pressurizing the piping downstream of the check valve, depressurizing the piping upstream of the check valve, and then measuring the pressure increase in the upstream piping. When the test was performed on June 15, 2002, the check valve was not adequately seated to prevent back flow from increasing the upstream header to greater than the 40 psig acceptance criteria. Operators did not declare the check valve inoperable. Instead they manually exercised this swing arm check valve. The test was then re-performed satisfactorily. The licensee's Plant Operations Safety Review Committee appropriately raised the question that because the check valve was exercised prior to the second performance of the test, the basis for considering the valve operable was unclear.

b. Findings

This item will be treated as unresolved pending further NRC review of the licensee's evaluation and resolution of the valve operability and testing methodology. **(URI 50-317; 50-318/2002-06-02)**

4OA5 Other Activities

.1 Unit 2 Steam Generator Replacement

a. Inspection Scope

The inspectors reviewed the Calvert Cliffs Unit 2 steam generator replacement project (SGRP) planning, evaluations of lessons learned from the previous Unit 1 SGRPs, and related project tasks, procedures, work packages and 50.59 evaluations.

b. Findings

No findings of significance were identified.

.2 Steam Generator Replacement - Radiological Controls Planning

a. Inspection Scope

The inspector reviewed planned radiological controls for the upcoming Unit 2SGRP. The inspector discussed the project with project team representatives and reviewed various plans and procedures supporting the project. The following matters were reviewed:

- ALARA planning and preparation, project dose estimates, and dose tracking methodology,
- project exposure controls including temporary shielding,
- surface and airborne contamination controls including restoration of containment openings, as appropriate,
- radioactive material management including radionuclide characterization, waste storage, and disposal plans,
- project radiological work plans and controls,
- project staffing and training plans,
- emergency contingencies,
- radiological safety plans for storage of the old steam generators including conduct of public and potential worker dose assessments plans, and radiological environmental monitoring,
- evaluation of radionuclide characterization for dose assessment purposes,
- surveillance and planned audits of work activities including resolution of worker concerns, and
- the efforts to identify and implement lessons learned from previous steam generator replacements at other facilities including replacement of steam generators at Calvert Cliffs Unit 1 in 2001.

The review was against criteria contained in 10 CFR 19.12, 10 CFR 20, site technical specifications, and applicable site and project procedures.

b. Findings

No findings of significance were identified.

.3 Interim Compensatory Measures (Temporary Instruction 2515/148)

a. Inspection Scope

An audit of the licensee's performance of the interim compensatory measures imposed by the NRC's Order Modifying License, issued February 25, 2002, was completed in accordance with the specifications of NRC Inspection Manual Temporary Instruction (TI) 2515/148, Revision 1, Appendix A, dated September 13, 2002.

b. Findings

No findings of significance were identified.

.4 Operation of an Independent Spent Fuel Storage Installation (ISFSI)

a. Inspection Scope

The inspector observed spent fuel loading operations for Dry Shielded Canister (DSC) No. 39 conducted in accordance with fuel handling procedure 350 (FH-350), "DSC Loading and Unloading." Blowdown and drying operations and Helium leak testing of DSC-39 were reviewed with respect to Technical Specification 2.2.1 and 2.2.2 criteria, respectively. Radiological work practices and exposure rates were discussed with

technicians responsible for the on-going work. Personnel exposures were evaluated and radiation work permit (RWP) 2002-0156 was examined. A comparison of radiological data to previous DSCs was performed.

The inspector discussed with cognizant licensee representatives the procedural controls in place that ensured only designated fuel assemblies were properly loaded into DSC-39. A review of the spent fuel assembly move sheets and verification records that are required by FH-350 was conducted. The inspector observed a video tape of final fuel configuration in DSC-39 which clearly indicated fuel assembly serial numbers. Fuel characteristics, including enrichments, burn-up, post irradiation cooling time, heat generation, and known structural defects, were reviewed and evaluated against the technical specification and license (SNM-2505) limits.

The inspector reviewed 10 CFR 72.48 safety evaluations generated in 2002, including SE00160 regarding revised shielding and dose rate calculations for the 24P DSC, and 72.48 screening (MO 0200000392) regarding acceptability of storing radioactive material containers in the ISFSI pad area. The inspector also reviewed Issue Report IR3-052-135 regarding fuel handling procedure changes to compensate for Technical Specification 3/4.1 non-conservatism.

Training and qualifications of selected personnel involved with ISFSI work were reviewed to ensure adherence to the Calvert Cliffs training program as specified in UFSAR, Section 9.3. This review included operations personnel responsible for fuel transfers, maintenance personnel responsible for welding operations, and non-destructive test inspectors responsible for dye penetrant tests and helium leak testing.

A tour of the ISFSI pad and enclosed area was conducted to ensure SNM-2505 license criteria were being maintained. Equipment and facilities required for the safe transfer of the DSC to the ISFSI pad were inspected.

b. Findings

No findings of significance were identified.

4OA6 Management Meetings

Exit Meeting Summary

On January 27, 2003, the inspector presented the inspection results to licensee management and other staff who acknowledged the findings. No proprietary information was identified.

ATTACHMENT 1

SUPPLEMENTAL INFORMATION

a. Key Points of Contact

J. Carroll, Plant General Manager Assistant
M. Cox, Supervisor, Mechanical/Civil Engineering
J. Dalrymple, Steam Generator Replacement Project, Project Manager
G. Dockstaeder, Design Engineering Manager
M. Gahan, Supervisor, Issues and Assessment Unit
M. Geckle, Director, Nuclear Regulatory Matters
G. Gwiazdowski, Director, Nuclear Security/Emergency Planning
M. Haney, Radiation Protection Supervisor
P. Hebrank, Project Manager
D. Holm, Manager, Nuclear Operations
J. Jaeger, Principal Engineer, Primary Systems
D. Jordan, Radioactive Waste Supervisor
P. Katz, Vice President
M. Korsnick, Manager, Work Management
K. Neitmann, Plant General Manager
G. Pavis, Nuclear Fuels Director
E. Roach, Supervisor, Materials Processing
K. Robinson, General Supervisor, Integrated Work Management
S. Sanders, General Supervisor-Radiation Safety
K. Skotnicki, Senior Quality Assurance Accessor
J. Spina, Manager, Nuclear Maintenance
J. Suarez-Marias, Instrumentation Engineering Manager
R. Szoch, General Supervisor, Plant Engineering
R. Wyvill, ALARA Supervisor

b. List of Items Opened, Closed, or Discussed

Opened

50-317;50-318/02-006-001	URI	Resolution of projected doses from turbine gland seal exhauster due to steam generator leakage
50-317;50-318/02-006-002	URI	Review of the licensee's evaluation, and resolution for safety injection check valve operability and testing methodology

Closed

50-317;50-318/02-004-003	VIO	Failure to prepare a shipment of radioactive materials so as not to exceed the transportation radiation limits of 49 CFR 173.441(a)

c. List of Documents Reviewed

Maintenance Rule

Periodic Assessment Of Maintenance Rule Program, October 2000 through September 2002
Preventive Maintenance Deferrals - Emergency Diesel Generators
Preventive Maintenance Deferrals - Aux Feedwater System
Preventive Maintenance Deferrals - Condensate System
IR3-029-365, Corrective Action and Goal Setting Plan - Auxiliary Feedwater Turbine Overspeed
IR2-000-556, Corrective Action and Goal Setting Plan - Auxiliary Feedwater Power Supply
IR3-030-552, Corrective Action and Goal Setting Plan - Unit 1 Feedwater System, Regulating Bypass Valve
IR3-004-529, Corrective Action and Goal Setting Plan - Containment Isolation, Check Valve Leak
IR3-015-544, Corrective Action and Goal Setting Plan - Containment Spray, Check Valve Seat Tightness
IR2-000-805, Corrective Action and Goal Setting Plan - Reactor Coolant System, Pressurizer Valve Seat Tightness
IR2-001-762, Corrective Action and Goal Setting Plan - Reactor Coolant Pump, Vibration
IR3-052-767, Completion of (a)(1) placement and development of corrective action plan
IR3-052-769, Consideration of Industry Operating Experience During (a)(1) Goal Setting
IR3-052-771, Documenting of (a)(1) reviews that do not result in placement of (a)(1) status
MN-1-102 R8, Preventive Maintenance Program
QSS Week 0238, Risk Significant Activities Evaluated (Unit 1 and 2)
Maintenance Rule Scoping Document for Aux Feedwater, Emergency Diesels, and Condensate Systems
1L200100200, Self Assessment of Effectiveness of Outage Risk Assessment Process (6/14/02)
MN-1-112 R8, Managing System Performance
PD 200000004 Causal Analysis - Pressurizer Safety Valve 2RV200 Seat Leakage
PD 200000006 Causal Analysis - Pressurizer Electromagnetic Relief Valve 1ERV402 Seat Leakage
Summary of Recommendations from 2000 Maintenance Rule (a)(3) Assessment
QL 2-100 R15, Issue Reporting and Assessment
MN-1-124 R4, Conduct of Integrated Work Management
RM 1-306 R0, Processing Regulatory Information
NS-1-100 R3, Use of Industry Operating Experience

Permanent Plant Modifications

ES199601526-216-000, Unit 2 Steam Generator Replacement
ES200000820-000-000 Unit 2 Power Operated Relief Valve and Logic Modifications
ES200000820-001-000 Unit 2 Power Operated Relief Valve and Logic Modifications, Supp. 1
ES200000820-002-000 Unit 2 Power Operated Relief Valve and Logic Modifications, Supp. 2
ES200200004-001-000 Pressurizer Spray Control Modifications
ES200100735-000-000 Battery Charger Failure Modifications
ES200000175-000-000 Battery Room Air Flow Switch Modification
ES200200135-000-000 Letdown System Flow Alarms and Transients Modifications
ES200100605-000-000 Auxiliary Feedwater Turbine Bearing Vibration Modifications
ES200100565-000-000 Auxiliary Feedwater Turbine Bearing Lubrication Modifications

ES199602497-000-000 Feedwater Regulating Valve Positioner Modifications
ES199602497-001-000 Feedwater Regulating Valve Positioner Modifications, Supplement 1
ES199602497-002-000 Feedwater Regulating Valve Positioner Software Modifications
ES200000017-000-000 Power Operated Relief Valve Block Valve Operator Modifications
ES199600580-000-000 4160 Vac Breaker Retrofit, Original
ES199600580-000-001 4160 Vac Breaker Retrofit, Revision 1
ES199600580-001-001 4160 Vac Breaker Retrofit, Supplement 1, Revision1
ES199600580-001-002 4160 Vac Breaker Retrofit, Supplement 1, Revision 2
ES199600580-001-003 4160 Vac Breaker Retrofit, Supplement 1, Revision 3
ES199600580-002-000 4160 Vac Breaker Retrofit, Supplement 2, Original
ES199600580-004-000 4160 Vac Breaker Retrofit, Supplement 4, Original
ES199801517-000-000 4160 Vac Breaker Retrofit
ES200000484-000-000; U1C16 Fuel Reload, 2002 Refueling Outage
ES200100836-002-000; Radioactive Liquid Waste Processing System Modifications
ES200100510-000-000; Increase Reactor Coolant System Lithium Limit from 3.5 ppm to 5.0 ppm

10 CFR 50.59 Safety Evaluations

(SE00394, Revision 1) for ES199601526-000; Replacement of Units 1 and 2 Steam Generators
Attachment 3, (SE00471, Revision 1) for ES200000484-000-000;U1C16 Fuel Reload, 2002 RFO
Attachment 3, (SE00482) for ES200100836-002-000; Radioactive Liquid Waste Processing System Modifications
Attachment 3, (SE00475) for ES200100510-000-000; Increase RCS Lithium Limit
Attachment 3, (SE00453) for ES199801545-000 Changes to UFSAR Chapter 11, Revision 0
Attachment 3, (SE00260) for ES199800247-000 Changes to UFSAR Section 9.7, Revision 0
Attachment 3, (SE00450) for ES200000837-000 Changes to Test Pressure for Pressurizer Power Operated Relief Valve Testing, Revision 1
Attachment 3, (SE00456) for ESP200001058 Modify Penetration 2ZED09 for Ten Year Integrated Leakage Rate Testing, Revision 0
Attachment 3, (SE00455) for ES199701230-000 Control Room Ventilation, Revision 2
Attachment 3, (SE00463) for TA 1-01-0053 Remove Internals of 1-CV-110P or Q, Revision 0
Attachment 3, (SE00469) for ES199900950-000 Containment Spray Pump Impeller Diameter, Revision 0

10 CFR 50.59 Safety Screens

Attachment 2, ES200000820-000-000 Unit 2 Power Operated Relief Valve and Logic Modifications
Attachment 2, ES200000820-001-000 Unit 2 Power Operated Relief Valve and Logic Modifications, Supplement 1
Attachment 2, ES200000820-002-000 Unit 2 Power Operated Relief Valve and Logic Modifications, Supplement 2
Attachment 2, ES200200004-001-000 Pressurizer Spray Control Modifications
Attachment 2, ES200100735-000-000 Battery Charger Failure Modifications
Attachment 2, ES200000175-000-000 Battery Room Air Flow Switch Modification
Attachment 2, ES200200135-000-000 Letdown System Flow Alarms and Transients Modifications

Attachment 2, ES200100605-000-000 Auxiliary Feedwater Turbine Bearing Vibration Modifications
Attachment 2, ES200100565-000-000 Auxiliary Feedwater Turbine Bearing Lubrication Modifications
Attachment 2, ES199602497-000-000 Feedwater Regulating Valve Positioner Modifications
Attachment 2, ES199602497-001-000 Feedwater Regulating Valve Positioner Modifications, Supplement 1
Attachment 2, ES199602497-002-000 Feedwater Regulating Valve Positioner Software Modifications
Attachment 2, ES200000017-000-000 Power Operated Relief Valve Block Valve Operator Modifications
Attachment 2, ES199600580-000-000 4160 Vac Breaker Retrofit, Original
Attachment 2, ES199600580-000-001 4160 Vac Breaker Retrofit, Revision1
Attachment 2, ES199600580-001-001 4160 Vac Breaker Retrofit, Supplement 1, Revision 1
Attachment 2, ES199600580-001-002 4160 Vac Breaker Retrofit, Supplement 1, Revision 2
Attachment 2, ES199600580-001-003 4160 Vac Breaker Retrofit, Supplement 1, Revision 3
Attachment 2, ES199600580-002-000 4160 Vac Breaker Retrofit, Supplement 2, Original
Attachment 2, ES199600580-004-000 4160 Vac Breaker Retrofit, Supplement 4, Original
Attachment 2, ES199801517-000-000 4160 Vac Breaker Retrofit
Attachment 2, ES200000484-000-000
Attachment 2, ES200100836-002-000
Attachment 2, ES200100510-000-000
Attachment 2, ES199601526-000 Steam Generator Replacement
Attachment 2, ES199701358-002 Replace 2A Emergency Diesel Generator Woodward Governor
Attachment 2, ES199800827-008 Add Close Permissive Interlock to Breakers 252-1106 and 2106
Attachment 2, ES199800061-000 Correct Drawing 87313, Sheet 7
Attachment 2, ES199801510-000 Replace Ashcroft Pressure Indicating Gages on Condensate Discharge Line
Attachment 2, ES199801232-000 Install VOTES for DOS Version 2.5
Attachment 2, ES200000017-000 Replace Power Operated Relief Valve Block Valves 2MOV403 and 2MOV405
Attachment 2, ES200000175-000 Replace Battery Rooms Supply Fan Heater Switch O-FS-5362
Attachment 2, ES200100282-000 Valve 2CV631 Bonnet to Body Flange Connection
Attachment 2, ES200100735-000 Install 40A Power Feed to the New Spare Battery Charger 1L40
Attachment 2, ES200100849-001 Automatic Signal to Shut Steam Generator Blowdown Containment Isolation Valves on Auxiliary Feedwater Actuation Signal
Attachment 2, ES200200264-000 Install Suppression Diodes Across Various Solenoid Valves, Revision 0
Attachment 2, ES200200264-000 Install Suppression Diodes Across Various Solenoid Valves, Revision 1
Attachment 2, ES2002-344-000 Starting Air Moisture Separator for 2A, 1B and 2B

<u>Design References</u>

IEEE Standard C37.59-1996; IEEE Standard Requirements for Conversion of Power Switchgear Equipment
ANSI/IEEE C37.20-2-1987; IEEE Standard for Metal-Clad and Station-Type Cubicle Switchgear
ABB Breaker Technical Manual, Document Number 8067-ICE-3439
Qualification Summary Report for the ABB 4KV Horizontal Rollout Vacuum Breaker for Calvert Cliffs Nuclear Power Plant; Report Number 8067-ICE-37612, Revision 09

Procedures

NO-1-117, Rev 8	Integrated Risk Management
EN-1-100	Engineering Service Process Overview
EN-1-102	10 CFR 50.59/10 CFR 72.48 Reviews
Engineering Services Qualification and Training Manual, Revision 9	
ETP 98-096, Revision 1	4 KV Vacuum Breaker Functional Test, 152-2411, 23 Service Water Pump, 24 bus
ETP 02-018, Revision 0	4 KV Vacuum Breaker Functional Test, 152-1113, 500 KV Switchyard Feeder
ETP 02-020, Rev 0	4 KV Vacuum Breaker Functional Test, 152-2113, 500 KV Switchyard Feeder
ETP 02-019, Revision0	4 KV Vacuum Breaker Functional Test, 152-2111, 23 Service Water Pump to 21 bus
Work Order, MO2200000853	Replace 152-2113 with a Vacuum Breaker per ES199600580-000 and remove MJ switch per ES220000503-002
Work Order, MO200003262	Replace 152-1113 with a vacuum breaker per ES199600580-000-000.
OP-5	Plant Shutdown from Hot Standby to Cold Shutdown, Revision 48
STP O-7A-1	"A" Train Engineered Safety Features Logic Test, Revision 54
STP O-73M-1	Containment Spray Flow Test, Revision 3
STP O-73M-1	Containment Spray Flow Test Results May 22, 2002
STP O-73M-1	Containment Spray Flow Test Results May 17, 2002
STP O-73M-1	Containment Spray Flow Test Results May 14, 2002
STP O-73K-1	Containment Spray Pump Operability Test, Revision 8
STP O-73K-1	Containment Spray Pump Operability Test Results May 5, 2002
STP O-73K-1	Containment Spray Pump Operability Test Results May 9, 2002
STP O-73K-1	Containment Spray Pump Operability Test Results May 16, 2002
STP O-73K-1	Containment Spray Pump Operability Test Results May 21, 2002
STP 108D-2 Pg. 2	May 3, 2002. Revision 1
STP 108D-2 Pg. 112	May 3, 2002. Revision 1

Design Change Notices

DCN 61075 Sh. 0040A	Install Surge Suppression Diode, Revision - 0
DCN 61075 Sh. 0043	Install Surge Suppression Diode, Revision - 0
DCN 61075 Sh. 0045	Install Surge Suppression Diode, Revision - 0
DCN 61075 Sh. 0054	Install Surge Suppression Diode, Revision - 0
DCN 63075 Sh. 0040A	Install Surge Suppression Diode, Revision - 0
DCN 63075 Sh. 0043	Install Surge Suppression Diode, Revision - 0
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63009	Single Line Meter & Relay Diagram 480 Unit Buses 21A, 21B, 24A & 24B
63101	SL Meter & Relay Diagram 480 Unit Buses 22A, 22B, 23A & 23B & 25
63005 SH0001	Meter & Relay Diagram 4 KV System Unit Buses 21 and 24
63006	Meter & Relay Diagram 4 KV System Unit Buses 22, 23, 25, 26
61009	SL Meter & Relay Diagram 480 Unit Buses 11A, 11B, 14A & 14B, Revision 37
61001 SH0002	Diesel Generator Project Electrical Main Single Line Diagram
61019 Sh. 001	SL Diagram Intake Structure 480V MCC 107SW and 122, Revision 21
61026	SL and Riser Diagram Lighting Panels and Transformers, Revision 27
61033	Diagram 125VDC Vital System Bus 01 Reserve Battery System, Revision 13
61212 Sh. 2	One/Three Line Plant Site Electrical Power, Revision 36

61407 Sh. 0130	Lighting Panel Schedule Three Phase Panel 1L40, Revision 12
63024	Single Line Diagram 125VDC Vital System Bus 21, Revision 36
64310	Unit 1 Chemical Volume and Control System SL-073, Revision 8
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d. List of Acronyms

ALARA	As Low As is Reasonably Achievable
CFR	Code of Federal Regulations
CS	Containment Spray
CSA	Collective Significance Analysis
DBD	Design Basis Documents
DRS	Division of Reactor Safety
FSAR	Final Safety Analysis Report
HPSI	High Pressure Safety Injection
HRA	High Radiation Area
IP	Inspection Procedure
IR	Issue Report
ISFSI	Independent Spent Fuel Storage Installation
LPCI	Low Pressure Coolant Injection
MOV	Motor-Operated Valve
MSIV	Main Steam Isolation Valve
NRC	Nuclear Regulatory Commission
PI	Performance Indicator
QA	Quality Assurance
RFO, RO	Refuel Outage
RP&C	Radiological Protection and Chemistry
RVLMS	Reactor Vessel Level Measurement System
SCBA	Self-Contained Breathing Apparatus
SRV	Safety Relief Valve
SSC	Structures, Systems and Components
UFSAR	Updated Final Safety Analysis Report
URI	Unresolved Item

ATTACHMENT 2

SUPPLEMENTAL INSPECTION OF WHITE INSPECTION FINDING IN THE AREA OF RADIOACTIVE MATERIAL TRANSPORTATION

1. Cross-References to PI&R Findings Documented Elsewhere (95001)

a. Inspection Scope

A package of radioactive material, shipped from the Calvert Cliffs facility on May 23, 2002, to a waste processing facility, was found to have radiation dose rates exceeding applicable regulatory limits after arrival at the processing facility (May 28, 2002). This matter was reviewed and the results of this review were documented in NRC Inspection Report 50-317/02-04; 50-318/02-04, dated July 30, 2002. The NRC evaluated the issue and concluded the issue was a finding of low to moderate safety significance (WHITE) (Reference EA-02-138, NRC Report No. 50-317/02-04; 50-318/02-04, dated August 19, 2002). In October 2002, the NRC conducted an onsite supplemental inspection of this matter to assure that the causes of the performance issues associated with this finding were understood, the extent of condition had been identified, and that corrective actions were sufficient to prevent recurrence. The results of this inspection were documented in NRC Inspection Report No. 50-317/02-011; 50-318/02-011, dated November 7, 2002. Inspection Procedure 95001, "Inspection for One or Two White Inputs in a Strategic Performance Area," was used as guidance for the inspection.

The inspection in October 2002 found that, although a root cause evaluation was conducted and root and contributing cause were identified, the NRC was not able to assure that the extent of condition of risk significant performance issues had been identified or that the corrective actions taken or planned were sufficient to address the issues including broader-based concerns identified during the inspection. As a result, the issues associated with the finding were not closed and the NRC coordinated a follow-up inspection to re-inspect the issues following the licensee's review of these matters.

During this inspection, the inspector re-inspected these issues. The inspector reviewed extent of condition evaluations, corrective actions taken and planned to address the issues, and the broader-based concerns identified (e.g., program procedures, human performance, or oversight activities). The applicable corrective action documents were reviewed during the inspection.

b. Findings

The following sections discuss the NRC Inspection Procedure 95001 inspection attributes and the inspector's conclusions relative to those attributes following re-inspection of these matters.

Section 02.01 Problem Identification

a. Determine that the evaluation identifies who (i.e., licensee, self-revealing, or NRC) and under what conditions the issue was identified.

The licensee's Causal Analysis (PD200200005) indicated that this event was identified by the vendor (self-revealing) and that the condition was assumed to have been created while the container was being transported to the vendor. (Reference NRC Inspection Report No. 50-317/02-011; 50-318/02-011, dated November 7, 2002)

b. Determine that the evaluation documents how long the issue existed, and prior opportunities for identification.

A Causal Analysis (PD200200005) indicated that the condition was assumed to have been created while the container was being transported to the vendor. (Reference NRC Inspection Report No. 50-317/02-011; 50-318/02-011, dated November 7, 2002)

The licensee identified that a previous event had occurred associated with elevated radiation dose rates on a shipping container (RCAR 94-002, 1994) and that one of the corrective actions could have possibly helped prevent this recent event. However, the analysis did not identify the controls established or determine if those controls would have provided a prior opportunity to identify the most recent issue. (Reference NRC Inspection Report No. 50-317/02-011; 50-318/02-011, dated November 7, 2002)

The licensee subsequently conducted a Collective Significance Analysis (CSA) (IR200200631) of recent and previous radwaste handling issues, including transportation issues for the period 1994-2002. The analysis evaluated the effectiveness of corrective actions and response to precursors. The analysis concluded there was an overall weakness in the effectiveness of corrective actions with respect to root cause analysis reports in radiation safety, and that radiation safety did not identify precursor events and take effective actions at the appropriate level to prevent recurrence. Based on these conclusions, the licensee initiated various action items, and planned and scheduled additional action items to improve corrective action and their effectiveness within radiation safety including radioactive material transportation. (IR200200631)

c. Determine that the evaluation documents the plant-specific risk consequences (as applicable) and compliance concerns associated with the issue.

The Causal Analysis (PD200200005) concluded there were no plant-specific, worker, or public risk consequences associated with this matter. The Issue Report (IR No. IR3-077-457) identified compliance concerns as they relate to exceeding radiation dose limits on shipping packages. (Reference NRC Inspection Report No. 50-317/02-011; 50-318/02-011, dated November 7, 2002)

The licensee subsequently conducted a Collective Significance Analysis (CSA) (IR200200631) of recent and previous radwaste handling issues, including transportation issues for the period 1994-2002. The licensee had also conducted a causal analysis (AF200200003) associated with failure to resolve significant issues through the corrective action programs. The analyses identified areas for improvement relative to human performance. The licensee initiated various action items and planned and scheduled additional action items to improve human performance. (IR200200631, AF200200003).

Section 02.02 Root Cause and Extent of Condition Evaluation

a. Determine that the problem was evaluated using a systematic method(s) to identify root cause(s) and contributing cause(s).

The licensee used its formally documented corrective action processes to identify root and contributing causes. (Reference NRC Inspection Report No. 50-317/02-011; 50-318/02-011, dated November 7, 2002)

b. Determine that the root cause evaluation was conducted to a level of detail commensurate with the significance of the problem.

The root cause evaluation and corrective actions were documented via a Causal Analysis (PD200200005) (IR No. IR3-077-457). The Causal Analysis indicated that a definitive cause to the greater than permitted radiation dose rates on the exterior of the package could not be found. (Reference NRC Inspection Report No. 50-317/02-011; 50-318/02-011, dated November 7, 2002)

The Causal Analysis did not identify what the corrective actions for the previous event (RCAR 94-002, 1994) were or why they were inadequate to prevent a second occurrence of elevated radiation dose rates (above regulatory limits) on the exterior of a shipped package. The evaluation did not address possible inadequate radiological surveys by the technicians (i.e., failure to follow prescribed radiation safety procedures) or why the technicians were using incorrect survey meters for surveying bags containing small objects with elevated radiation dose rates. The Causal Analysis did not evaluate potential causes as inadequate radiation protection program procedures or failure to implement prescribed procedures. The evaluation did not discuss whether the current training program for radiation protection personnel was deficient in this area which may have contributed to the cause. Based on the above, it was not clear that the root cause evaluation was conducted to a level of detail commensurate with the significance of the problem. (Reference NRC Inspection Report No. 50-317/02-011; 50-318/02-011, dated November 7, 2002)

The licensee subsequently conducted a Collective Significance Analysis (CSA) (IR200200631) of recent and previous radwaste handling issues, including transportation issues (1994-2002). The analysis evaluated the effectiveness of corrective actions and response to precursors. The analysis concluded there was an overall weakness in the effectiveness of corrective actions with respect to root cause analysis reports in radiation safety, and that radiation safety did not identify precursor events and take effective actions at the appropriate level to prevent recurrence.

Constellation Generation initiated various compensatory, and planned and scheduled action items to improve corrective actions with radiation safety including radioactive material transportation. (IR200200631)

c. Determine that the root cause evaluation included consideration of prior occurrences of the problem and knowledge of prior operating experience.

The root cause evaluation and corrective actions were documented via a Causal Analysis (PD200200005) (IR No. IR3-077-457). The Causal Analysis indicated that a definitive cause to the greater than permitted radiation dose rates on the exterior of the package could not be found. The analysis did identify similar prior occurrences based on review of operating experience. However, the analysis did not identify what action the licensee took on those operating experience issues or whether they were adequate. (Reference NRC Inspection Report No. 50-317/02-011; 50-318/02-011, dated November 7, 2002)

As discussed above, the licensee subsequently conducted a Collective Significance Analysis (CSA) (IR200200631) of recent and previous radwaste handling issues, including transportation issues for the period 1994-2002. The analysis evaluated the effectiveness of corrective actions and response to precursors. The analysis concluded there was an overall weakness in the effectiveness of corrective actions with respect to root cause analysis reports in radiation safety, and that radiation safety did not identify precursor events and take effective actions at the appropriate level to prevent recurrence. Based on these conclusions, the licensee initiated various action items, and planned and scheduled additional action items to improve corrective action and their effectiveness within radiation safety including transportation of radioactive materials. (IR200200631)

d. Determine that the root cause evaluation included consideration of potential common cause(s) and extent of condition of the problem.

The licensee's Causal Analysis (PD200200005) included a discussion of the extent of the problem and generic implications. However, the analysis focused primarily on the surveying of small point sources of radioactive materials as the probable cause. (Reference NRC Inspection Report No. 50-317/02-011; 50-318/02-011, dated November 7, 2002)

The licensee's Nuclear Performance Assessment Department's review of radioactive waste shipping and handling activities identified concerns relative to the Causal Analysis involving an apparent performance trend issue, effectiveness of previous and planned corrective actions, and effectiveness of radiological controls oversight capabilities to pre-identify deficiencies. The review by that group prompted issuance of an Issue Report (IR4-011-551). In addition, a separate licensee technical analysis (Causal Analysis Scoresheet) of the Causal Analysis (PD200200005) also identified a number of questions and concerns relative to the adequacy of the Causal Analysis. (Reference NRC Inspection Report No. 50-317/02-011; 50-318/02-011, dated November 7, 2002)

Based on the above discussion, the inspector did not have assurance that the root and contributing causes of risk significant performance issues, in the area of packaging and

shipment of radioactive materials, were fully understood or that the extent of condition of risk significant performance issues had been identified. (Reference NRC Inspection Report No. 50-317/02-011; 50-318/02-011, dated November 7, 2002)

The licensee subsequently conducted a Collective Significance Analysis (CSA) (IR200200631) of recent and previous radwaste handling issues, including transportation issues (1994-2002). The analysis evaluated the effectiveness of corrective actions and response to precursors. The analysis concluded there was an overall weakness in the effectiveness of corrective actions with respect to root cause analysis reports in radiation safety, and that radiation safety did not identify precursor events and take effective actions at the appropriate level to prevent recurrence. The licensee initiated various compensatory and planned action items to improve corrective actions with radiation safety and radioactive material transportation to address these matters. (IR200200631)

Section 02.03 Corrective Actions

a. Determine that appropriate corrective action(s) are specified for each root/contributing cause or that there is an evaluation that no actions are necessary.

The licensee took a number of immediate actions to review the event and preclude recurrence. The licensee suspended shipments of radioactive materials with radiation dose rates greater than 100 millirem/hr, quarantined applicable radiation survey instruments for evaluation, trained personnel on the event, and reviewed personnel qualifications. Radiation protection personnel were dispatched to the vendor facility to inspect and evaluate the shipment. Notwithstanding, the inspector could not determine that appropriate corrective action(s) are (were) specified for each root/contributing cause or that there was an evaluation that no actions were necessary. (Reference NRC Inspection Report No. 50-317/02-011; 50-318/02-011, dated November 7, 2002)

The licensee subsequently conducted a Collective Significance Analysis (CSA) (IR200200631) of recent and previous radwaste handling issues, including transportation issues (1994-2002). The analysis evaluated the effectiveness of corrective actions and response to precursors. The analysis concluded there was an overall weakness in the effectiveness of corrective actions with respect to root cause analysis reports in radiation safety, and that radiation safety did not identify precursor events and take effective actions at the appropriate level to prevent recurrence. The licensee initiated various compensatory and planned action items to improve corrective actions with radiation safety and radioactive material transportation and improve radioactive material shipping activities. These actions included restriction of radioactive material shipments from the site to essential, approved shipments; development and implementation of a shipping improvement plan; enhancement of supervisor oversight of shipping activities; and development of performance indicators for radioactive materials shipments. (IR200200631)

b. Determine that the corrective actions have been prioritized with consideration of the risk significance and regulatory compliance.

The inspector could not determine that appropriate corrective actions were specified for each root/contributing cause. (Reference NRC Inspection Report No. 50-317/02-011; 50-318/02-011, dated November 7, 2002)

The licensee subsequently conducted a Collective Significance Analysis (CSA) (IR200200631) of recent and previous radwaste handling issues, including transportation issues (1994-2002). The analysis identified additional root and contributing causes. The analysis identified additional corrective actions to improve performance. The licensee initiated various prioritized compensatory and planned corrective action items to improve corrective actions with radiation safety and radioactive material transportation. (IR200200631)

c. Determine that a schedule has been established for implementing and completing the corrective actions.

A schedule was established for the corrective actions. (Reference NRC Inspection Report No. 50-317/02-011; 50-318/02-011, dated November 7, 2002)

The licensee subsequently conducted a Collective Significance Analysis (CSA) (IR200200631) of recent and previous radwaste handling issues, including transportation issues (1994-2002). The licensee identified a number of additional areas for improvement and initiated various compensatory and planned scheduled action items to address those areas. (IR200200631)

d. Determine that quantitative or qualitative measures of success have been developed for determining the effectiveness of the corrective actions to prevent recurrence.

The licensee's Causal Analysis (PD200200005) required the conduct of an effectiveness review, by November 30, 2003, of the actions taken and planned as a result of the root cause analysis. Notwithstanding, the analysis did not identify under what conditions routine shipment of radioactive materials may resume. (Reference NRC Inspection Report No. 50-317/02-011; 50-318/02-011, dated November 7, 2002)

The licensee had suspended all shipment of radioactive materials and had developed compensatory measures to allow shipment of critical materials (e.g., radioactive samples). The licensee subsequently initiated development of a risk based performance matrix that provided for phase-in of shipping activities as appropriate radioactive material shipping compensatory and/or corrective actions were implemented. As part of the corrective actions, the licensee also initiated development of objective, measurable standards that can be used to ensure compliance with shipping regulations. (IR200200631)

Conclusion:

Based on the above review, the licensee developed, planned, and implemented additional corrective actions to address the concerns identified during NRC Inspection No. 50-317/02-011; 50-318/02-011, dated November 7, 2002. The inspection identified that the licensee took additional actions to assure that the causes of the performance issues associated with this WHITE finding were understood, the extent of condition had been identified, and that corrective actions were sufficient to prevent recurrence.