Mr. Charles H. Cruse
Vice President
Constellation Nuclear
Calvert Cliffs Nuclear Power Plant, Inc.
1650 Calvert Cliffs Parkway
Lusby, MD 20657-4702

SUBJECT: CALVERT CLIFFS NUCLEAR POWER PLANT - NRC INSPECTION REPORT 50-317/01-12, 50-318/01-12

Dear Mr. Cruse:

On December 29, 2001, the NRC completed an inspection at your Calvert Cliffs Nuclear Power Plant Units 1 & 2. The enclosed report documents the inspection findings which were discussed on January 18, 2001, with Mr. Katz 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.

Immediately following the terrorist attacks on the World Trade Center and the Pentagon, the NRC issued an advisory recommending that nuclear power plant licensees go to the highest level of security, and all promptly did so. With continued uncertainty about the possibility of additional terrorist activities, the Nation's nuclear power plants remain at the highest level of security and the NRC continues to monitor the situation. This advisory was followed by additional advisories, and although the specific actions are not releaseable to the public, they generally include increased patrols, augmented security forces and capabilities, additional security posts, heightened coordination with law enforcement and military authorities, and more limited access of personnel and vehicles to the sites. The NRC has conducted various audits of your response to these advisories and your ability to respond to terrorist attacks with the capabilities of the current design basis threat (DBT). From these audits, the NRC has concluded that your security program is adequate at this time.

Based on the results of this inspection, the inspectors identified three issues of very low safety significance (Green). Two of these issues were determined to involve a violation of NRC requirements. However, because of their very low safety significance and because they have been entered into your corrective action program, the NRC is treating these issues as Non-cited Violations, in accordance with Section VI.A.1 of the NRC's Enforcement Policy. If you deny these Non-cited Violation, you should provide a response with the basis for your denial, within 30 days of the date of this inspection report, 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; and the NRC Resident Inspector at the Calvert Cliffs facility.

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.html (the Public Electronic Reading Room).

Sincerely,

Michele G. Evans, Chief
Projects Branch 1
Division of Reactor Projects

Docket Nos. 50-317
50-318
License Nos. DPR-53
DPR-69

Enclosures: Inspection Report 50-317/01-12 and 50-318/01-12

Attachment 1 - Supplemental Information

cc w/encl: M. Geckle, Director, Nuclear Regulatory Matters (CCNPPI)
R. McLean, Administrator, Nuclear Evaluations
J. Walter, Engineering Division, Public Service Commission of Maryland
K. Burger, Esquire, Maryland People's Counsel
R. Ochs, Maryland Safe Energy Coalition
J. Petro, Constellation Power Source
State of Maryland (2)

Distribution w/encl: H. Miller, RA/J. Wiggins, DRA (1)
T. Bergman, RI EDO Coordinator
D. Beaulieu - SRI - Calvert Cliffs
E. Adensam, NRR (ridsnrrdlpmlpdi)
D. Skay, PM, NRR
P. Tam, PM, NRR (Backup)
M. Evans, DRP
W. Cook, DRP
S. Barr, DRP
P. Torres, DRP
R. Junod, DRP
Region I Docket Room (with concurrences)

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U.S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket Nos: 50-317, 50-318

License Nos.: DPR-53, DPR-69

Report Nos: 50-317/01-12;
50-318/01-12

Licensee: Calvert Cliffs Nuclear Power Plant, Inc.

Facility: Calvert Cliffs Nuclear Power Plant, Units 1 and 2

Location: 1650 Calvert Cliffs Parkway
Lusby, MD 20657-4702

Dates: November 11, 2001 - December 29, 2001

Inspectors: David Beaulieu, Senior Resident Inspector
Leonard Cline, Resident Inspector
Ron Nimitz, Senior Health Physicist
Nancy McNamara, Emergency Preparedness Inspector
John Caruso, Senior Operations Engineer
Charles Payne, Senior Operations Engineer, Region II

Approved by: Michele G. Evans, Chief, Projects Branch 1
Division of Reactor Projects

SUMMARY OF FINDINGS

IR 05000317/01-12, IR 05000318/01-12, on 11/11-12/29/2001, Calvert Cliffs Nuclear Plant, Inc.; Calvert Cliffs Nuclear Power Plant, Units 1 & 2. Problem Identification and Resolution.

The report covered a six week period of inspection by resident inspectors, Senior Operations Engineers, an Emergency Preparedness Inspector, and a Senior Health Physicist. The inspection identified three Green findings, two which were treated as non-cited violations. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using IMC 0609 "Significance Determination Process" (SDP). Findings for which the SDP does not apply are indicated by "No Color" or by the severity level of the applicable violation. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described at its Reactor Oversight Process website at http://www.nrc.gov/NRR/OVERSIGHT/index.html.

A. Inspector Identified Findings

Cornerstone: Mitigating Systems

GREEN. A non-cited violation of 10CFR50, Appendix B, Criterion XVI was identified because the licensee failed to take timely and effective corrective action to mitigate excessive train unavailability for the switchgear ventilation system. The Unit 1 and Unit 2 switchgear ventilation systems have been classified maintenance rule (a)(1) since the fourth quarter of 1996, and the systems have exceeded maintenance rule performance criteria every quarter since 1996. Although the corrective action plan that has been in place since 1996 specified replacing the pneumatic controls, the fans, and the compressors, three fans and all four compressors have not yet been replaced.

This issue has a credible impact on safety because the failure of the switchgear ventilation system to maintain switchgear room temperatures could result in the failure of safety related electrical busses in the switchgear room, as well as, the safety related equipment supplied by these busses. The finding was considered to be of very low safety significance, because the poor performance of this system has not resulted in switchgear room temperatures in excess of design limits. (Section 4OA2)

GREEN. A non-cited violation of 10CFR50, Appendix B, Criterion XVI, was identified because the licensee failed to identify and correct a condition adverse to quality on the 12 switchgear ventilation train. On October 8, 2001, the licensee failed to write an issue report to document that when the failure of both the 11 and 12 switchgear refrigeration compressors necessitated aligning the system in the fresh air mode, the 12 switchgear ventilation train was unable to maintain switchgear room temperature. When the inspector identified during a review of control room logs that no issue report had been written, the licensee wrote the issue report on October 24, 2001. No corrective action was taken by the licensee to investigate or correct the degraded condition until it repeated itself on October 27, 2001, when they found that misadjusted damper actuators resulted in 50% fresh air rather than 100%.

This issue has a credible impact on safety because the failure of the switchgear ventilation system to maintain switchgear room temperatures would result in the failure

of several safety significant mitigating systems. The finding was considered to be of very low safety significance, because following the failure of the 12 switchgear ventilation unit in the fresh air mode, the 11 switchgear ventilation train was placed in service and returned switchgear room temperature to normal. (Section 4OA2)

Cornerstone: Occupational Radiation Safety

GREEN. The licensee has not established effective problem resolution for recurring issues involving failure to conduct adequate radiological surveys to support planning and conduct of radiological work activities. On July 13, 2001, the licensee failed to conduct adequate pre-job and ongoing radiological surveys to detect elevated levels of radioactive contamination within the No. 22 Chemical and Volume Control system ion exchange pit for work therein. This contributed to elevated airborne radioactivity and limited intakes of airborne radioactive material by workers during the work activities. The licensee's root cause analysis and NRC review identified that similar inadequate radiological surveys had been identified on previous events and that some of these problems were repeated during the event despite the implementation of corrective actions. The failure to implement effective corrective actions is a cross-cutting issue determined to be more than minor. The issue was evaluated under the Occupational Radiation Safety Significance Determination Process (SDP) and determined to be a finding of very low safety significance. The issue was not an as low as reasonably achievable (ALARA) finding, did not involve an overexposure or substantial potential, and did not affect the ability to assess dose. The issue was included in the licensee's corrective action process (IR3-072-016 and Causal Analysis PD200100011). (Section 4OA2)

B. Licensee Identified Findings

A violation of very low safety significance which was identified by the licensee has been reviewed by the inspector. Corrective actions taken or planned by the licensee appear reasonable. This violation is summarized in Section 4OA7 of this report.

Report Details

Units 1 and 2 operated at or near 100 percent power for the entire inspection period.

1. **Reactor Safety**
Cornerstone: Initiating Events, Mitigating Systems, Barrier Integrity and Emergency Preparedness

1R01 Adverse Weather Protection

a. Inspection Scope

The inspector verified that safety related systems, structures, and components such as the condensate and refueling water storage tanks would remain functional when challenged by cold weather and freezing conditions. The inspector reviewed the Updated Final Safety Analysis Report (UFSAR), Individual Plant Examination of External Events, Technical Specifications, and Operations Administrative Policy (OAP) 92-09, "Cold Weather Operations," for cold weather operation requirements. To verify adequate implementation of these requirements, the inspector observed a plant operator perform Operations Performance Evaluation, PE 0-102-4-O-M, Revision 7, Freeze Protected Equipment, on December 18, 2001.

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 redundant train or backup system, while the affected train or system was inoperable or out of service. The walkdown included a review of system operating instructions to determine correct system lineup and verification of critical components to identify any discrepancies which could affect operability of the redundant train or backup system. The inspectors performed a partial system walkdown on the following system:

- 2B Emergency Diesel Generator

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

- Operating Instruction OI-21B, “2B Diesel Generator”

b. Findings

No findings of significance were identified.

.2 Complete Walkdown

a. Inspection Scope

The inspectors performed a complete walkdown of a risk-important support system for mitigating systems, the Unit 1 Electrical Switchgear Room Air Conditioning and Ventilation (HVAC) system, to identify any discrepancies between the existing equipment lineup and the required lineup. Operating Procedure OI-22H, "Switchgear Ventilation and Air Conditioning," the system description number 32, and Drawing No. 60-722-E, Auxiliary Building Ventilation System, were used to verify that electrical power was available as required; major system components were correctly labeled, lubricated, cooled, and ventilated; essential support systems were operational; and ancillary equipment and debris did not interfere with system performance. To assess the system's material condition, the inspectors reviewed the status of approximately 20 maintenance work orders (MOs) and over 15 issue reports (IRs) written over the previous two years. Specific attention was focused on IRs written and MOs worked on Unit 1 switchgear HVAC in September and October 2001, when several 11 and 12 switchgear HVAC compressor trips occurred. The documentation reviewed included:

- PE 1-32-2-O-M, Operations Performance Evaluation for Switchgear HVAC
- ES1996011050, Revision 1, Evaluate the Reliability of Equipment in the 27 foot Switchgear Room in an Appendix R Fire
- CA04511, Revision 0, Switchgear Room Transient Temperature Analysis Evaluating Probabilistic Risk Assessment Scenarios
- CA04658, Revision 0, Use of Outside Air Only to Cool the Unit 1 and Unit 2 Switchgear Rooms
- CA00086, Revision 3, Switchgear Emergency Ventilation Fans
- RAN 98-042, Revision 0, Switchgear Room Heat Load Analysis

b. Findings

No findings of significance were identified.

1R07 Heat Sink Performance

a. Inspection Scope

The inspectors reviewed data for the 21A and 21B service water (SRW) heat exchanger thermal performance test completed on October 3, 2001; the statistical evaluation for the 11A and 11B SRW heat exchanger thermal performance test completed on June 25, 2001, and; the results of the continuous monitoring thermal performance test conducted on 12A and 12B, and 22A and 22B SRW heat exchangers. The inspectors analyzed the data and results to verify that the SRW heat exchangers are capable of removing design basis heat loads as described in the UFSAR. The inspectors also verified that the licensee's testing methods were consistent with their response to Generic Letter 89-13, "Service Water System Problems Affecting Safety-Related Equipment," and were sufficient to detect heat exchanger degradation prior to a loss of required heat removal capabilities. The documentation reviewed included:

- Calculation CA04710, Revision 1, SRW Plate Heat Exchanger Thermal Performance Test Evaluation Methodology and Software Development

- Calculation CA03477, Revision 2, Service Water Plate Heat Exchanger Thermal Performance Evaluation
- Engineering Test Procedure ETP 99-001R, 21A and 21B SRW Heat Exchanger Thermal Performance Test
- Statistical Evaluation for Engineering Test Procedure ETP 98-040R, 11A and 11B SRW Heat Exchanger Thermal Performance Test

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification

.1 Requalification Activities Review by Resident Inspector

a. Inspection Scope

On November 13, 2001, the inspector observed licensed operator simulator training to assess operator performance for a scenario involving a loss of closed cooling water. In particular, the inspector observed operators trip reactor coolant pumps due to the loss of cooling water to the seals, which the licensee's probabilistic risk assessment has determined to be an important operator action.

b. Findings

No findings of significance were identified.

.2 Requalification Program Review By Regional Specialist

a. Inspection Scope

A review was conducted of recent operating history documentation found in inspection reports, licensee event reports, the licensee's corrective action program, and the most recent NRC plant issues matrix. The senior resident inspector was also consulted for insights regarding licensed operator performance. These reviews did not detect any operational events that were indicative of possible training deficiencies.

The following inspection activities were performed using NUREG 1021, Revision 8, "Operator Licensing Examination Standards for Power Reactors," Inspection Procedure Attachment 71111.11, "Licensed Operator Requalification Program," Appendix A "Checklist for Evaluating Facility Testing Material."

The inspectors reviewed the quality and performance of operating and written exams administered the week of November 12, 2001, as well as, a sample of several other exams administered to crews during prior exam weeks.

The results of the annual operating tests for years 2000 and 2001 and the written exam for 2001 were reviewed for quality, performance and grading. The inspector assessed whether failure rates were consistent with the guidance of NUREG-1021, Revision 8,

and NRC Manual Chapter 0609, Appendix I, "Operator Requalification Human Performance Significance Determination Process (SDP)." The SDP review verified the following:

- Crew pass rates were greater than 80%. (Pass rate was 100%)
- Individual pass rates on the written exam were greater than 80%. (Pass rate was 98.8%)
- Individual pass rates on the job performance measures of the operating exam were greater than 80%. (Pass rate was 97.6%)
- More than 75% of the individuals passed all portions of the exam. (97.6% of the individuals passed all portions of the exam)

Observations were made of the dynamic simulator exams and job performance measures administered during the week of November 12, 2001. These observations included facility evaluations of crew and individual performance during the dynamic simulator exams and individual performance of 5 job performance measures.

The remediation plans for individual failures over the past two year requalification program cycle were reviewed to assess the effectiveness of the remedial training. There were no crew failures during this period.

License reactivations for the past two year requalification program cycle were also reviewed to ensure that 10 CFR 55.53 license conditions and applicable program requirements were met.

Instructors and training/operation's management were interviewed for feedback regarding the implementation of the licensed operator requalification program.

Simulator performance and fidelity were reviewed for conformance to the reference plant control room.

A sample of records for requalification training attendance, program feedback, reporting, and medical examinations were reviewed for compliance with license conditions, including NRC regulations.

b. Findings

The licensee's methods and standards used to reactivate staff licensees to support refueling outages appeared to be inconsistent with the requirements of 10 CFR 55.53(f)(2). The site practice has been to have staff licensees stand one shift of under-instruction watch in the control room, conduct a tour of refueling equipment, and attend four hours of pre-refueling classroom training as a basis for reactivation as a limited refueling senior reactor operator. 10 CFR 55.53(f)(2) requires that the under-instruction watch be stood in the position to which the individual will be assigned. The under-instruction time in the control room appears to not have met the intent of the rule. This item will be treated as unresolved pending further guidance and clarification from the Operator Licensing Branch, Office of Nuclear Reactor Regulation. **(URI 50-317; 50-318/01-012-01)**

1R12 Maintenance Rule Implementation

a. Inspection Scope

The inspectors reviewed performance-based problems involving selected in-scope structures, systems, or components (SSCs) to assess the effectiveness of the maintenance program. Reviews focused on: (1) proper maintenance rule scoping, in accordance with 10 CFR 50.65; (2) characterization of failed SSCs; (3) safety significance classifications; (4) 10 CFR 50.65 (a)(1) and (a)(2) classifications; and (5) the appropriateness of performance criteria for SSCs classified as (a)(2), and goals and corrective actions for SSCs classified as (a)(1). The inspectors reviewed the most recent system health reports and system functional failures of the last two years. The following SSCs were reviewed:

- Unit 1 and Unit 2 Switchgear ventilation system. The licensee appropriately classified this system as (a)(1) due to excessive unavailability, and excessive and repeat functional failures. Recent failures of the Unit 1 No. 11 and No. 12 switchgear HVAC system refrigeration unit compressors, in September and October 2001, continued the systems poor performance trend. The inspector evaluated the acceptability of the licensee's corrective action plan as documented in Issue Report IR3-009-491, the evaluation, corrective action, and goal setting plan for the switchgear HVAC system, and the corrective actions specified in the recent IR's written in September and October 2001.

- The inspector reviewed the licensee data base of system unavailability for all equipment from November 20 to December 20, 2001, to verify that out-of-service times were entered into maintenance rule unavailability tracking as required.

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

- Station Procedure MN-1-112, Managing System Performance
- Maintenance Rule Scoping Document, Revision 17
- Maintenance Rule Indicator Report, October 2001

b. Findings

Two non-cited violations of very low safety significance (GREEN) of 10CFR50, Appendix B, Criterion XVI, "Corrective Action," were identified during this inspection. The details of these findings are discussed in section 4OA2 of this report.

1R13 Maintenance Risk Assessments and Emergent Work Evaluation

a. Inspection Scope

For the selected maintenance orders listed below, 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.

- MO2200002578 Replace 21 Switchgear HVAC fan
- MO1200004788 Replace 12 High Pressure Safety Injection Pump Outboard Bearing End Cover Gasket
- MO1200101956 Remove Spare Reactor Trip Circuit Breaker and Reinstall Trip Circuit Breaker 8

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:

- MO2199700801, Replace 21 Switchgear HVAC fan, which was retested by performing air flow measurements with the fan operating in the maximum recirculation mode and the 100% outside air mode. The acceptance criteria for both measurements based on the systems design basis was 12,000 cubic feet per minute (CFM).

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 the selected risk-significant system to assess whether they satisfied Technical Specifications, Updated Final Safety Analysis Report, Technical Requirements Manual, and licensee procedure requirements. The inspectors assessed whether the testing appropriately demonstrated that the system was operationally ready and capable of performing its intended safety functions. The following test was witnessed:

- STP O-70-1, "Monthly Test of "A" train Containment Cooling Units, Iodine Removal Units and Penetration Exhaust Filter" was inspected on December 3, 2001.

b. Findings

No findings of significance were identified.

1EP2 Alert and Notification System (ANS) Testing

a. Inspection Scope

On November 5, 2001, the licensee notified the NRC (Event Notification 38466) that while conducting their annual full cycle offsite siren test, all 49 sirens in Calvert County failed to activate. There are 72 total sirens covering the 10 mile Plume Exposure Emergency Planning Zone (EPZ). The apparent cause was that an activation icon, located on a computer at Calvert County's 911 Center, may have been inadvertently removed. The other two risk counties' emergency operating centers were not affected. The licensee immediately initiated a task force to review this issue and documented their results. On November 15, 2001, the licensee reported resolution of the computer activation problem with a successful siren test which included full siren activation. During the 10 day period of vulnerability, the licensee was relying on automatic route alerting for notification of the public in Calvert County in the event of an emergency at the Calvert Cliffs nuclear plant. The licensee's review was to establish how long the vulnerability existed prior to November 5, 2001. The licensee noted that automatic route alerting has been in effect since the inception of the system in the early 1980s. On a periodic basis, the inspector received status reports on the problem from licensee representatives.

b. Findings

Preliminarily, the licensee's review established that there was a human error while attempting to simplify the County 911 Center's computer screen. A contractor hired by Calvert County inadvertently removed the icon for proper actuation of the sirens in Calvert County. The licensee's backup public notification system is route alerting. The inspector determined that the Calvert County's Emergency Plan states that automatic route alerting would be initiated simultaneously with the activation of the emergency sirens. Therefore, although the sirens were incapable of being activated during the period of vulnerability, had a radiological event occurred, the licensee believes that the public would have been properly notified via route alerting.

At the end of this inspection report period, the inspector was gathering additional information from the licensee pertaining to the County's siren activation and route alerting processes. The inspector was also assessing the adequacy of the capability to notify the public within the EPZ as required by 10 CFR Part 50, 5.47(b)(5) and Appendix E.IV.D.3, and system design objectives as noted in FEMA-REP-10. Therefore, this issue is considered an Unresolved Item pending the completion of the licensee's review and the inspector's assessment. **(URI 50-317; 50-318/01-012-02)**

1. RADIATION SAFETY

Cornerstone: Occupational 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 radiologically controls including access controls to radiologically significant areas.

The inspector toured portions of Unit 1 and Unit 2 Auxiliary Building and reviewed access controls to locked High Radiation Areas. Four locked High Radiation Area access points were physically inspected to determine if access controls were sufficient to preclude unauthorized entry, as appropriate. Also reviewed was 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 radiological controls provided and accrued occupational radiation doses received by divers performing underwater work activities in the Unit 1 spent fuel pool on December 5, 2001.

The inspector reviewed the planned reorganization of the radiological controls organization relative to Technical Specification 5.2.1.

The reviews in this area were against criteria contained in 10 CFR 20 and applicable licensee 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 the effectiveness of the licensee's program to reduce occupational radiation exposure to ALARA. Specifically, the inspector reviewed the licensee's planning and preparation for the upcoming Unit 1 outage. The review was against criteria contained in 10 CFR 20 and applicable licensee procedures. The following matters were reviewed:

- The current status of integrated work planning including the status of planned work, the status of completion of ALARA planning efforts, principal exposure reduction efforts to be implemented, the radiological risk classification efforts of selected planned activities, implementation of lessons learned.

- ALARA planning for tasks with projected exposure greater than 5 person-rem including radiation safety, maintenance activities, scaffolding, reactor assembly and disassembly and vessel head penetration work, implementation of lessons learned.

b. Findings

No findings of significance were identified.

2OS3 Radiation Monitoring Instrumentation

a. Inspection Scope

The inspector selectively reviewed elements of the radiation monitoring instrumentation calibration program to evaluate the adequacy and effectiveness of the program. Specifically, the inspector reviewed the use, calibration, and source checking of three laboratory radiation counting systems to verify that the instruments were calibrated and source checked as required by station procedures. The inspector reviewed applicable statistical control charts for the instruments. The instruments reviewed were: NMC-14(Sn. 84-2660-14), SPA-3(Sn.138), and SAC 4(Sn. 578).

The review was against applicable station procedures and 10 CFR 20.

b. Findings

No findings of significance were identified.

4 OTHER ACTIVITIES (OA)

40A1 Performance Indicator Verification

a. Inspection Scope

The inspectors reviewed performance indicator (PI) data for the Mitigating Systems cornerstone, Emergency AC Power System Unavailability, for Units 1 and 2, to verify individual PI accuracy and completeness. This inspection examined data and plant records from third quarter of 2000 through the third quarter of 2001, including a review of PI Data Summary Reports, Licensee Event Reports, operator narrative logs, and maintenance rule records.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA2 Identification and Resolution of Problems

.1 Switchgear Ventilation

a. Inspection Scope

The inspector evaluated the acceptability of the licensee's corrective action plan to address the poor performance of the switchgear HVAC system as documented in Issue Report IR3-009-491, the maintenance rule (a)(1) evaluation, corrective action, and goal setting plan for the system, and in the issue reports (IRs) written to address the Unit 1 switchgear HVAC compressor trips and damper failures that occurred in September and October 2001.

b. Findings

Two non-cited violations of very low safety significance (GREEN) of 10CFR50, Appendix B, Criterion XVI, "Corrective Action," were identified. Following a brief discussion of system operation, the details of each finding are discussed below.

The switchgear HVAC system for Unit 1 and 2 are identical. On each unit the system provides cooling to the A and B train safety related switchgear rooms. The system consists of two redundant HVAC units that include a supply fan, cooling coil, and refrigeration compressor. The HVAC units in each system discharge to a common supply header for both the A and B train switchgear rooms, and take suction from outside air and a common exhaust header from the switchgear rooms. The temperature limits for the switchgear rooms are 104°F for continuous operation, and 150°F for peak

operations. The temperature limits are based on ensuring switchgear operability by maintaining switchgear bus bar hot-spot temperatures less than 185°F.

A non-cited violation of very low safety significance (GREEN) of 10CFR50, Appendix B, Criterion XVI was identified because the licensee failed to take timely and effective corrective action to mitigate excessive train unavailability for the switchgear HVAC.

The Unit 1 and Unit 2 switchgear HVAC systems have been classified maintenance rule (a)(1) since the fourth quarter of 1996. In IR1-050-852, dated October 21, 1996, the licensee classified the switchgear HVAC systems on both units as (a)(1) under the maintenance rule. In its (a)(1) Evaluation, Corrective Action and Goal Setting plan for the system, the licensee attributed the high unavailability to obsolete equipment and refrigeration system design issues. The corrective action plan specified replacing the pneumatic controls, the fans, and the compressors. As of December 2001, five years after the system was classified (a)(1), only the pneumatic control system has been upgraded for all four switchgear HVAC trains. For fan replacement, the licensee initiated ES19961674 in January 1996. Only the 21 switchgear HVAC fan has been replaced. The 22 switchgear HVAC fan is scheduled for installation in May 2002, and the fans for the 11 and 12 switchgear HVACs will be installed in the Fall 2002. For compressor replacement, ES199602324 was initiated in November 1996, but currently no new compressors have been installed. The compressors for 21 and 22 switchgear HVAC are scheduled for installation in May 2002. The 11 and 12 switchgear HVAC compressors are scheduled for the fall 2002.

Interim corrective actions, since 1996, have also been ineffective at maintaining system reliability. Since that time, in every quarter, at least three of the four switchgear HVAC trains have exceeded the unavailability performance criteria of 250 hours per train per 2 year period, and in many cases train unavailability has been more than four times the performance criteria. In addition, the Unit 1 switchgear HVAC system has exceeded the functional failure performance criteria of less than five functional failures per two year period every quarter since 1996.

The failure to implement timely and effective corrective action to address the poor performance of the switchgear HVAC system has a credible impact on safety because the failure of the switchgear HVAC system to maintain switchgear room temperatures within the design limits of 104°F and 150°F would lead to switchgear failure. This would result in the failure of several safety significant mitigating systems. This issue was assessed as very low safety significance, because the poor performance of this system has not resulted in switchgear room temperatures in excess of 104°F.

The failure to take timely and effective corrective action to address poor reliability and unavailability of the switchgear HVAC system is a violation of 10CFR50, Appendix B, Criterion XVI, “Corrective Action,” which requires prompt correction of conditions adverse to quality. This violation is being treated as a Non-cited Violation, consistent with Section VI.A of the NRC Enforcement Policy, issued on May 1, 2000 (65FR25368) **(NCV 50-317;50-318/01-012-03)**. The licensee entered the issue into its corrective action program as IR3-080-027.

A second non-cited violation of very low safety significance (GREEN) of 10CFR50, Appendix B, Criterion XVI was identified because the licensee failed to identify and correct a condition adverse to quality on 12 switchgear HVAC.

On October 8, 2001, the 12 switchgear HVAC train was placed in service in the fresh air mode because both switchgear HVAC refrigerant compressors had tripped and were considered unavailable. At that time outside air temperature was approximately 50°F, low enough that based on licensee engineering calculations, the fresh air mode could maintain switchgear room temperature below the design limit of 104°F. Six hours later, operators received a Unit 1 safety related switchgear room high temperature alarm. Operators secured the 12 switchgear HVAC train placed the 11 switchgear HVAC in service in the fresh air mode, and as expected, switchgear room temperature returned to normal. On that day, no action was taken to investigate the cause of the failure of the 12 switchgear HVAC to perform as expected in the fresh air mode. During a review of control room logs and meteorological tower data for outside air temperature, the inspector identified that the licensee did not write an issue report to investigate and correct the 12 switchgear HVAC problem. On October 24, 2001, the licensee wrote IR3-050-297 to document the inspector's concern but no immediate corrective action was taken. On October 27, 2001, after both switchgear HVAC compressors had tripped, operators again placed the 12 switchgear HVAC in service in the fresh air mode, and at 12 hours later the 12 switchgear HVAC could no longer maintain switchgear room temperature. Operators placed 11 switchgear HVAC in service in the fresh air mode to return switchgear room temperature to normal, and documented the issue in IR3-077-133. Troubleshooting determined that the cause of the 12 switchgear HVAC problem was a misadjusted actuator for the mixing dampers resulting in only 50% fresh air rather than 100%. The condition was corrected on October 29, 2001. The licensee verified that a similar condition did not exist on the other switchgear HVAC trains.

The failure to identify and correct the degraded condition of the 12 switchgear HVAC unit on October 8, 2001, had a credible impact on safety because the failure of the switchgear ventilation system to maintain switchgear room temperatures could result in the failure of safety related electrical busses in the switchgear room, as well as, the safety related equipment supplied by these busses. This issue was assessed as very low safety significance because following the failure of the 12 switchgear HVAC unit in the fresh air mode, the 11 switchgear HVAC returned switchgear room temperature to normal.

The failure to identify and correct the degraded condition of the 12 switchgear HVAC fan on October 8, 2001, was a violation of 10CFR50, Appendix B, Criterion XVI, "Corrective Action," which requires the identification and resolution of conditions adverse to quality. This violation is being treated as a Non-cited Violation, consistent with Section VI.A of the NRC Enforcement Policy, issued o May 1, 2000 (65FR25368) **(NCV 50-317/01-012-04)**. The licensee has entered this issue into its corrective action program as IR3-014-145.

.2 Radiation Safety

a. Inspection Scope

The inspector reviewed the licensee's root cause analysis for an airborne radioactivity event associated with work in the No. 22 Chemical Volume and Control System (CVCS) ion exchanger pit on July 13, 2001. The radiological controls aspect of the event were reviewed during NRC Combined Inspection No. 50-317;50-318/2001-006. During the previous inspection, one Non-cited licensee identified violation was identified and one inspector identified violation was identified and documented in that NRC report. During this current inspection, the inspector focused on the adequacy of the licensee's corrective actions for previous events.

b. Findings

GREEN. The licensee has not established effective problem resolution relative to recurring issues involving failure to conduct adequate radiological surveys to support planning and conduct of radiological work activities.

On July 13, 2001, the licensee failed to conduct adequate pre-job and ongoing radiological surveys to detect elevated levels of radioactive contamination within the No. 22 CVCS ion exchange pit for work therein. This contributed to elevated airborne radioactivity and limited intakes of airborne radioactive material by workers during the work activities. The licensee's root cause analysis for this event and the inspector's review indicated that inadequate radiological surveys had been identified on previous events and that some of these problems were repeated during the event (e.g., inadequate job planning, inadequate radiological job coverage). For example, on May 3, 2001, the licensee experienced elevated airborne radioactivity during work in the Unit 2 containment resulting in limited intakes of airborne radioactive material. The licensee's root cause analysis for the May 3, 2001, event (IR3-076-089; RCAR IR2-001-0404) identified inadequate radiological surveys, lack of specific work permit instructions and lack of a questioning attitude as contributing causes for this event. Similarly, on April 8, 2000 (IR3-054-967;IR3-044-244), the licensee failed to conduct radiological contamination surveys of bags of material prior to removing the surface contaminated bags from the Unit 1 reactor cavity to a non-contaminated area in the Unit 1 Auxiliary Building. This resulted in personnel and clean area contamination. (These issues were documented in NRC Inspection Report Nos. 50-317;50-318/2001-006, 2001-005, and 2000-009). Although the licensee recognized the inadequacies in the radiological surveys, had taken various corrective actions for the previous issues, and none of the events resulted in significant personnel contamination or intakes of radioactive material, the occurrence of the July 13, 2001, event indicates that the licensee's corrective actions for previous radiological events (e.g., more thorough planning and provision of minimum expectations for surveys by technicians for job coverage) has not been effective in resolving issues involving the conduct of effective radiological evaluations to support work activities.

The failure to implement effective corrective actions is a cross-cutting issue as defined in NRC MC 0610* in that the issue has the potential to affect multiple cornerstones. This issue was determined to be more than minor in that failure to implement effective corrective actions could be reasonably viewed as a precursor to a more significant event. Further, the issue is associated with conditions contrary to licensee procedures. The issue was evaluated under the Occupational Radiation Safety Significance SDP and determined to be a finding of very low safety significance (GREEN). The issue was

not an ALARA finding in that no significant personnel exposures have occurred, the issue did not involve an overexposure or substantial potential for such an exposure, and the ability to assess dose was not compromised. The issue was included in the licensee's corrective action process (IR3-072-016 and Causal Analysis PD200100011) **(FIN 50-317;50-318/01-012-05)**

4OA5 Steam Generator Replacement (50001)

a. Inspection Scope

The inspector reviewed planned radiological controls for the upcoming steam generator replacement project (SGRP). 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
- project dose estimates and dose tracking
- project exposure controls including temporary shielding
- surface and airborne contamination controls including restoration of containment openings
- radioactive material management including source term analysis, 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 steam generators including conduct of public and potential worker dose assessments plans and radiological environmental monitoring
- evaluation of radiological source terms for dose assessment purposes
- surveillance and planned audits of work activities including resolution of worker concerns
- the licensees efforts to identify and implement lessons learned from previous steam generator replacements at other facilities.

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.

4OA6 Management Meetings

.1 Exit Meeting Summary

The inspectors presented the inspection results to members of licensee management at the conclusion of the inspection on January 18, 2001.

The inspectors asked the licensee whether any of the material examined during the inspection should be considered proprietary. No proprietary information was identified.

4OA7 Licensee Identified Violations

The following finding of very low safety significance (GREEN) was identified by the licensee and is a violation of NRC requirements which meets Section VI of the NRC Enforcement Policy, NUREG-1600, for being dispositioned as a Non-Cited Violation.

NCV Tracking Number	Requirement Licensee Failed to Meet
50-317;50-318/01-012-06	10 CFR71.87 requires the licensee to load shipments of radioactive material in accordance with written procedures. On September 5, 2001, the licensee did not adhere to procedure RPS 2-231, for the loading of a Type B shipment of radioactive material. Specifically, the licensee did not ensure hardware compatibility ratings for hoisting operations and used a crane hook, rated to 6,000 pounds, to raise and transfer in air an approximately 7000 pound container of waste containing approximately 91 curies of mixed radionuclides. The licensee identified the issue on November 6, 2001, and subsequently determined the hook had been load tested to 9,000 pounds. The licensee took various corrective and preventative actions and placed the issue into its corrective action process (IR3-059-464).

ATTACHMENT 1

a. Key Points of Contact

W. Birney, Supervisor, Requalification Training Unit
C. Cruse, Vice President
P. Katz, Plant General Manager
M. Geckle, Director, Nuclear Regulatory Matters
M. Haney, Radiation Protection Supervisor
D. Holm, Superintendent, Nuclear Operations
J. Hornick, Supervisor, Initial Training Unit
J. Kellum, Senior Operations Instructor
M. Korsnick, Superintendent, Work Management
K. Mills, General Supervisor, Nuclear Plant Operations
M. Navin, Superintendent, Technical Support
K. Nietmann, Manager, Nuclear Performance Assessment Department
T. Pritchett, Manager, Nuclear Engineering Department
E. Roach, Radioactive Waste Supervisor
S. Sanders, General Supervisor-Radiation Safety
J. Sickle, General Supervisor, Nuclear Training
J. Spina, Superintendent, Nuclear Maintenance
R. Szoch, General Supervisor, Plant Engineering
L. Weckbaugh, Manager, Nuclear Support Services
R. Wyvill, ALARA Supervisor
J. York, Assistant General Radiation Supervisor

b. List of Items Opened, Closed, or Discussed

Opened

50-317;50-318/01-012-001	URI	Licensee's methods and standards used to reactivate staff licensees to support refueling outages appeared to be inconsistent with the requirements of 10 CFR 55.53(f)(2). (IR Section 1.R11)
50-317;50-318/01-012-002	URI	During a November 5, 2001, full cycle offsite siren test none of the 49 sirens in Calvert County activated. It appears that planning standard 10CFR50.47(b)(5) and the requirements of 10CFR50 Appendix E.IV.D.3 have been violated.(IR Section 1EP2)

Opened and Closed

50-317;50-318/01-012-003	NCV	Failure to take timely and effective corrective action to mitigate excessive train unavailability for the switchgear HVAC in accordance with 10CFR50, Appendix B, Criterion XVI (IR Section 4OA2)

50-317/01-012-004	NCV	Failure to identify and correct a condition adverse to quality on the 12 switchgear HVAC in accordance with 10CFR50, Appendix B, Criterion XVI (IR Section 4AO2)
50-317;50-318/01-012-005	FIN	Failure to implement effective corrective actions for issues involving inadequate radiological evaluations to support work activities (IR Section 4AO2)
50-317;50-318/01-012-006	NCV	Failure to implement 10 CFR71.87 regarding adherence to cask loading procedures (IR Section 4AO7)

c. List of Acronyms

ALARA	As Low As Reasonably Achievable
CFM	Cubic feet per minute
CFR	Code of Federal Regulations
CVCS	Chemical and Volume Control System
DBT	Design Basis Threat
EPZ	Emergency Planning Zone
FEMA	Federal Emergency Management Agency
FIN	Finding
HVAC	Ventilation System
IR	Issue Report
MC	Inspection Manual Chapter
MO	Maintenance Order
NCV	Non-cited Violation
NRC	Nuclear Regulatory Commission
OAP	Operations Administrative Policy
PI	Performance Indicator
RCA	Radiologically Controlled Area
SDP	Significance Determination Process
SGRP	Steam Generator Replacement Project
SRW	Service Water System
SSC	Structure, System and Component
UFSAR	Updated Final Safety Analysis Report
URI	Unresolved Item