

May 7, 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 50-317/03-02, 50-318/03-02

Dear Mr. Katz:

On March 29, 2003, the NRC completed an inspection at your Calvert Cliffs Nuclear Power Plant (CCNPP) Units 1 & 2. The enclosed report documents the inspection findings which were discussed on April 17, 2003, with Mr. Kevin Nietmann 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.

This report documents one inspector identified finding concerning emergency action level classification during a drill and a second self revealing finding concerning breaker reliability. Both these findings were determined to be of very low safety significance (Green). Neither finding presented an immediate safety concern. Both findings were also determined to involve violations of NRC requirements. However, because of the very low safety significance and because the issues have been entered into your corrective actions program, the NRC is treating these findings as non-cited violations, in accordance with Section VI.A. of the NRC's Enforcement Policy.

If you contest any of the violations noted in this report, 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, D.C. 20555-0001; with copies to the Regional Administrator, Region I; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, D.C. 20555-0001; and the NRC Resident Inspector at the site.

Since the terrorist attacks on September 11, 2001, the NRC has issued five Orders (dated February 25, 2002, January 7, 2003 and April 29, 2003) and several threat advisories to licensees of commercial power reactors to strengthen licensee capabilities, improve security force readiness, and enhance controls over personnel 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
License Nos.: DPR-53, DPR-69

Enclosures: Inspection Report 50-317/03-02 and 50-318/03-02
w/Attachment - Supplementary Information

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REGION I

Docket Nos.: 50-317, 50-318

License Nos.: DPR-53, DPR-69

Report Nos.: 50-317/03-02 and 50-318/03-02

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: December 29, 2002 - March 29, 2003

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TABLE OF CONTENTS

SUMMARY OF FINDINGS	iii
1. REACTOR SAFETY	1
1R04 Equipment Alignment	1
1R05 Fire Protection - Fire Area Tours	2
1R08 Inservice Inspection (ISI) Activities	2
1R11 Licensed Operator Requalification Program	3
1R13 Maintenance Risk Assessments and Emergent Work Control	4
1R14 Personnel Performance Related to Non-Routine Plant Evolutions and Events .	4
1R15 Operability Evaluations	5
1R19 Post-Maintenance Testing	6
1R20 Refueling and Outage Activities	6
1R22 Surveillance Testing	7
1R23 Temporary Plant Modifications	8
1EP6 Drill Evaluation	9
RADIATION SAFETY	10
2OS1 Access Control To Radiologically Significant Areas	10
2OS2 ALARA Planning and Controls	12
OTHER ACTIVITIES	12
4OA1 Performance Indicator (PI) Verification	12
.1 Drill and Exercise Performance (DEP)	12
.2 Units 1 and 2 – Reactor Coolant System (RCS) Activity	13
4OA2 Problem Identification and Resolution (PI&R)	13
.1 Safety Injection Check Valve Testing	13
.2 Occupational Radiation Safety PI&R	14
.3 Steam Generator Replacement Project and ISI PI&R	15
.4 Cross-Reference to PI&R Findings Documented Elsewhere	15
4OA3 Event Follow-up	15
.1 (Closed) LER 50-317/03-01-00, Failure of 4kV GE Breaker Due to Cracking in Auxiliary Switch Cam Follower	15
.2 (Closed) 50-317 Unit 1 Reactor Vessel Water Level Monitoring System (RVLMS) Special Report dated February 21, 2003	19
4OA5 Other Activities	19
.1 Unit 2 - Steam Generator Replacement Radiation Safety	19
.2 Unit 2 - Steam Generator Replacement Preparations	20
4OA6 Management Meetings	20
.1 Exit Meeting Summary	20
ATTACHMENT: SUPPLEMENTAL INFORMATION	
KEY POINTS OF CONTACT	1
LIST OF ITEMS OPENED, CLOSED AND DISCUSSED	1
LIST OF DOCUMENTS USED AND REVIEWED	2
LIST OF ACRONYMS	5

SUMMARY OF FINDINGS

IR 05000317/2003-002, 05000318/2003-002; Calvert Cliffs Nuclear Plant, Inc.; on 12/29/2002 - 3/29/2003; Calvert Cliffs Nuclear Power Plant, Units 1 & 2; Drill Evaluation and Event Follow-up.

The report covered a 3-month period of inspection by the resident inspectors with support from a NRR senior reactor analyst, regional project engineering inspectors and a senior emergency preparedness inspector. The period also included announced inspections by a senior health physicist and regional specialist inspectors. Two Green non-cited violations (NCV) were identified during this inspection. 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 may be "Green" or be assigned a severity level after NRC management review. 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. NRC-Identified and Self-Revealing Findings

Cornerstone: Emergency Preparedness

- Green. The inspectors identified a Green (of very low safety significance) finding that the operating crew being evaluated during a simulator exercise failed to make an emergency action level (EALs) classification in accordance with the station's administrative guidance. Following the exercise, the drill critique failed to appropriately identify the EAL classification error.

The inspectors determined that this finding was more than minor because if left uncorrected it could become a more significant safety concern because of the potential for untimely public notification of an emergency. This finding represents a drill critique process failure to identify a weakness associated with a risk significant planning standard, during a limited facility interaction drill. The significance of this finding was determined to be of very low safety significance (Green) in accordance with the Emergency Planning SDP. (Section 1EP6)

Cornerstone: Mitigating Systems

- Green. A self-revealing NCV was documented regarding CCNPP's inadequate and untimely corrective actions to prevent recurrence of SBM-type auxiliary switch failures as required by 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action." The finding is considered a PI&R cross-cutting issue due to the failure to prevent recurrent SBM-type switch failures and due to inadequate and incomplete extent of condition reviews since CCNPP's review of industry operating experience regarding degraded and defective General Electric (GE) SBM switches in 1996.

The inspectors determined that this event was more than minor because the finding represented an actual loss of the safety function, for 28 days, for the

Summary of Findings (cont'd)

1B emergency diesel generator (EDG) to be capable of providing emergency electrical power to the number 14 4kV vital emergency bus. The safety significance of this finding was very low using Phase 3 of the SDP process. The risk of the 1B EDG being unavailable was low because of a plant design feature that allows the Unit 2 motor driven auxiliary feedwater pump to supply the Unit 1 steam generators during a station blackout (no AC power) at Unit 1. (Section 4OA3)

B. Licensee-Identified Violations.

- None

Report Details

Summary of Plant Status

Unit 1 operated throughout the period at or near 100 percent power except for a small power reduction for routine main turbine valve testing and condenser waterbox cleaning.

Unit 2 began the period at full power. A minor power reduction was conducted on January 27 to investigate and repair reactor temperature instrumentation. On February 14, 2003, power was reduced to conduct pre-outage surveillance testing and the unit was subsequently shutdown to begin the refueling and steam generator replacement outage (Section R20). The unit remained shutdown at the end of the inspection period.

1. REACTOR SAFETY [R]

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity, and Emergency Preparedness

1R04 Equipment Alignment

a. Inspection Scope

The inspectors performed three partial system walkdowns during this inspection period. In general, the inspections conducted included a partial walkdown of equipment alignment to evaluate the operability of a selected train or component while the affected redundant train or component was inoperable. The walkdown included a review of system operating instructions (OIs) to determine correct system lineup and verification of critical components to identify any discrepancies that could affect operability of the redundant train or backup system. The inspectors performed partial system walkdowns on the following systems and components:

- U2 Auxiliary Feed Water (AFW) Pump Room (21 and 22 AFW Pumps) were inspected February 3 and 4, 2003
- 11B service water (SRW) Heat Exchanger was inspected on January 30, 2003, while the SRW 11A Heat Exchanger was out of service for cleaning
- 13 AFW Pump was walked down on February 20, while the motor was being replaced on the 23 AFW Pump

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

- OI-32A-2, "Unit 2 - Auxiliary Feedwater System"
- OI-32A-1, "Unit 1 - Auxiliary Feedwater System"
- OI-15-1, "Unit 1 - Service Water System"
- OI-29-1, "Unit 1 - Saltwater (SW) System"

The inspectors verified that an inspector-identified discrepancy between the operation of the AFW pump room ventilation systems as described in the Update Final Safety Analysis Report (UFSAR) and the system operating procedures was entered into the corrective action process and documented by issue report (IR) IR4-002-760.

b. Findings

No findings of significance were identified.

1R05 Fire Protection - Fire Area Toursa. Inspection Scope

The inspectors conducted tours of two 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 administrative procedure SA-1-100, "Fire Prevention," during the conduct of this inspection. The two areas inspected included:

- 0C Emergency Diesel Generator Building
- 2B Emergency Diesel Generator Room

b. Findings

No findings of significance were identified.

1R08 Inservice Inspection (ISI) Activitiesa. Inspection Scope

The inspector reviewed the documentation supporting the discovery, disposition, repair, and testing of a leak in the pressure weld on the Unit 2 pressurizer level tap, LT-110X. The inspector reviewed the current inspection program, procedure, and qualified ultrasonic testing of the abandoned cracked pressure boundary weld. The inspector observed a CCNPP staff member, qualified for Level III ultrasonic testing, instruct the vendor personnel on the ultrasonic interrogation of the cracked weld and observed the vendor personnel practice on a mock-up containing implanted flaws of the level tap.

The Unit 2 pressurizer level tap LT-110X repair left an area of mild steel vessel wall exposed to borated primary coolant. The inspector reviewed the corrosion calculation and discussed the basis for the calculation with CCNPP personnel. The basis for the corrosion rate was under review, due to current experience in the industry, and would be adjusted after NRC review of the owners group topical submittal on the subject.

The inspector reviewed the CCNPP American Society of Mechanical Engineers (ASME) Code repair and replacement program. The inspector reviewed a number of packages and interviewed responsible personnel to determine compliance with the Code requirements.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification Program

a. Inspection Scope

On February 11, the inspectors observed one licensed operator requalification training (LORT) evaluated simulator scenario in order to assess operators' performance and evaluators' critiques. The scenario was considered a drill for the NRC's drill and exercise performance indicator (DEP PI) purposes. The observations focused on high risk operator actions and operators' activities associated the emergency response plan. The inspectors observed the clarity and formality of communications, the implementation of appropriate actions in response to alarms, the performance of timely control board operation and manipulation, crew dynamics and the command and control provided by the control room supervisor. The inspectors observed the post-scenario critique conducted by the training evaluators with the evaluated crew's shift manager (SM). The critique was also used to facilitate a post-scenario self-assessment by the crew. The inspectors also reviewed the evaluators' crew competency worksheets and observed that individual operator evaluations were developed. The following evaluated simulator scenario was reviewed:

- The inspectors observed a scenario involving a reactor trip and loss of offsite power (LOOP) complicated by a loss of one steam driven auxiliary feedwater pump and a station blackout (SBO) that occurs when the one operable emergency diesel generator failed to start. The inspectors observed the performance of risk significant operator actions including emergency operating procedure (EOP)-0, "Post-Trip Immediate Actions" and EOP-7, "Station Blackout." Upon restoration of one vital 4kV bus, the inspectors observed the operators' respond to a loss of coolant accident and transition into EOP-5, "Loss of Coolant Accident."

The inspectors verified that CCNPP addressed a crew error of aligning the SBO diesel generator to a 4kV bus that was feeding a faulted 480V bus in the post-examination critique record. The inspectors also verified that CCNPP had initiated an issue report (IR) IR4-007-779, to enter into the corrective action program, an inspector identified issue that the EALs limited their coverage of essential busses to the 4kV busses and did not consider the impact of a fault on the associated 480 Volt bus.

On February 5, the inspectors observed selected portions of licensed operator simulator training conducted in preparation for the upcoming refueling outage. The inspectors observed training and assessed operator performance during the conduct of operating procedure (OP)-5, "Plant Shutdown from Hot Standby to Cold Shutdown."

b. Findings

A finding regarding the crew's emergency action level (EAL) classification and declaration for the DEP PI is discussed in Report Section 1EP6. No other findings of significance were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control

a. Inspection Scope

The inspectors reviewed the four maintenance orders (MO) listed below and verified that: (1) the risk assessments were performed in accordance with CCNPP Procedure NO-1-117, "Integrated Risk Management"; (2) the risk of scheduled work was managed through the use of compensatory actions when required; and, (3) the applicable contingency plans were properly identified in the integrated work schedule when appropriate.

- MO1200203111 Clean 11A Service Water Heat Exchanger
- MO2200300364 21B Loop Cold Leg Temperature Transmitter - Channel D
- MO2200200978 2B Emergency Diesel Generator
- MO2199800570 23 AFW Pump - Temporary Installation of Spare Motor

b. Findings

No findings of significance were identified.

1R14 Personnel Performance Related to Non-Routine Plant Evolutions and Events

.1 Unit 2 Shutdown

a. Inspection Scope

The inspectors observed the February 14, 2003, control room activities as the reactor was shutdown from power operations and placed in hot standby (Mode 1 to Mode 4). The inspectors verified that the activities were performed in accordance with operating procedures (OP)-3, "Normal Power Operations" and OP-4, "Plant Shutdown from Power Operation to Hot Standby." After unloading the turbine, the reactor was manually tripped from approximately 25 percent reactor power in accordance with OP-4. The inspectors observed that the reactivity manipulations were made by a dedicated licensed operator under the direction of a dedicated senior reactor operator. The inspectors noted that CCNPP nuclear fuel engineering personnel were present to support the operators during reactivity manipulations. No deviations from expected core behavior were observed. The inspectors verified that axial shape index, power, and control element assembly (CEA) overlap were maintained within TS limits. The inspectors also observed that the operators monitored reactor coolant system (RCS) temperature and cooldown rate every 10 minutes and independently verified that the TS cooldown rate

limit was not exceeded. The inspectors note that communications, peer checks, and crew briefings were conducted in accordance with site administrative procedures.

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations

a. Inspection Scope

The inspectors reviewed five operability determinations (ODs) to assess the technical adequacy of the evaluations, the use and control of compensatory measures and compliance with the licensing and design basis. The inspectors' review included a verification that the operability determinations were made as specified by CCNPP's Procedure NO-1-106, "Functional Evaluations/Operability Determination." The technical content of the ODs was reviewed and compared to TS, the technical requirements manual (TRM), the UFSAR, and associated design and licensing basis documents. The following evaluations were reviewed:

- OD 02-016, Smoke and Flame Detection for the Truck Bay and Equipment Loading Area and Solid Waste Processing Area - 45 Foot - Auxiliary Building Out of Service for Greater Than the 14-Day Restoration Time.
- OD 02-013, Steam Driven Auxiliary Feed Water Pump Hold Down Bolts.
- OD 02-015, Loss of Control Power to 23 Service Water Pump ABB/Westinghouse 4 kV breaker
- OD 03-002, Degraded and non-conforming condition of SBM-type auxiliary switches in safety related GE Magna-Blast breakers.
- OD 03-003, ABB Breaker Fail to Close due to non-conforming manufacturing tolerances of certain OEM trip latch parts.

The inspectors verified that CCNPP had initiated an issue report (IR4-000-083) to document the problems and failures of ABB 4 kV breakers and to investigate the potential generic implications.

b. Findings

A finding involving inadequate corrective actions to prevent the recurrence of the failure of 4kV GE Magna-Blast breakers due to cracking of an SBM-type auxiliary switch cam follower is discussed in Section 4OA3.1. No other 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 three maintenance orders and post-maintenance tests were reviewed:

- MO2200301051, the replacement of a relay in the 2B EDG engine crankcase was retested, in part, by performing a four hour loaded run in accordance with STP 0-8B-2, "Test of 2B DG and 4 kV Bus 24 LOCI Sequencer"
- MO2200200978, 2B EDG - 2-year preventive maintenance and inspections were retested, in part, by testing the mechanical overspeed setting using operating instruction (OI)-21B-2, "2B Diesel Generator"
- MO2200300364, troubleshooting, repair and replacement of temperature transmitters for the 21 Loop Cold Leg was retested, in part, by completing selected portions of STP-M-212D-2, "Unit 2 - Channel "D" Reactor Protective System Functional Test"

b. Findings

No findings of significance were identified.

1R20 Refueling and Outage Activities

a. Inspection Scope

The inspectors reviewed the key activities planned and scheduled for the 2003 Unit 2 refueling and steam generator replacement outage. Prior to the start of the outage, the inspectors reviewed the shutdown safety summary schedule and a selected sample of contingency plans. This review was performed to determine whether CCNPP had assessed and planned actions to manage the risk associated with the 2003 outage activities. During the outage, the inspectors periodically reviewed the daily plant status report, integrated work schedules, a selected sample of contingency plans in effect, and implementation of administrative procedures for managing risk. Some of the specific activities reviewed included:

- **Observed the conduct of AFW System Full Flow Testing with the unit in Mode 1.**

- **Observed operators conduct a controlled shutdown from 93 percent power (Mode 1) to Hot Shutdown (Mode 4).**
- Reviewed plant cooldown data to verify that the plant cooldown was maintained within TS limits.
- Reviewed plant configuration to periodically verify its consistency with the minimum essential equipment list (MEEL), including availability of decay heat removal systems, as required.
- Periodically verified that fuel handling was performed in accordance with plant procedures and that the location of fuel assemblies and control elements were tracked during core offload.
- Selected maintenance activities, including 2B EDG maintenance outage, reactor pressure vessel (RPV) head inspections, and 21 low pressure safety injection pump low flow vibration troubleshooting.
- Walkdowns of selected areas of the containment during steam generator replacement activities.

Procedures and documents reviewed included:

- NO-1-103, "Conduct of Lower Mode Operations"
- NO-1-207, "Nuclear Operations Shift Turnover"
- Contingency Plan 03-04, "2B DG Unavailable"

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing

a. Inspection Scope

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

- STP 0-73H-2, "Unit 2 - AFW Pump Large Flow Test"
- STP-M-200-1, "Unit 1 - Reactor Trip Circuit Breaker Functional Test"
- STP 0-55A-2, "Containment Closure"
- NDE-5730-CC, "Unit 2 Mode 3 Boric Acid Walkdown"
- NDE-5732-CC, "Unit 2 Mode 5/6 Boric Acid Walkdown of Containment"

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- NDE-5734-CC, "Unit 2 Mode 5/6 Boric Acid Walkdown of Auxiliary Building"

The inspectors verified that procedure discrepancies identified during the performance of the surveillance tests were appropriately entered into the CCNPP corrective action program by the initiating Issue Report (IR) IR4-016-702 and a request for procedure activity (RPA-2003-0403). The inspectors also verified that CCNPP's inability to locate or retrieve a quality record associated with a boric acid walkdown during November 2001 was appropriately entered into the CCNPP corrective action program by the initiating **IR4-017-07**.

Subsequent to Unit 2 containment closure testing in accordance with STP 0-55A-2, a hole was found in the foam that seals the penetration through the emergency air lock temporary closure device. The foam sealant was being used to maintain the barrier between the containment and the outside atmosphere. An issue report (IR4-015-307) was written to document the deficiency. At the end of the inspection period, this issue remained under review and an investigation regarding the circumstances of this deficiency and the impact on the containment penetration during core alterations was ongoing.

b. Findings

No findings of significance were identified.

1R23 Temporary Plant Modifications

a. Inspection Scope

The inspectors reviewed temporary modification (TM) No. 2-01-0033, which temporarily jumpered the spent fuel handling machine (SFHM) slow speed restriction in the gate zone between the Unit 1 and Unit 2 Spent Fuel Pools. The jumper allows the wall zone interlock to prevent contact with the pool wall while allowing normal speed through the gate in manual electric operation. The inspectors assessed: (1) the adequacy of the 10 CFR 50.59 screening; (2) verified 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.

b. Findings

No findings of significance were identified.

1EP6 Drill Evaluation

Cornerstone: Emergency Preparedness [EP]

a. Inspection Scope

On February 19, 2003, the resident inspectors observed a licensed operator requalification training (LORT) simulator exercise that was also being evaluated as an emergency planning drill. The operating crew and evaluator performance was compared with the requirements of 10 CFR 50.47(b)(14) and Appendix E.IV.F.2.g.

b. Observations and Findings

Introduction. The inspectors identified a Green (of very low safety significance) finding that the operating crew being evaluated during a simulator exercise failed to make an emergency action level (EALs) classification in accordance with the station's administrative guidance. Following the exercise, the drill critique failed to appropriately identify the EAL classification error.

Description. On February 19, 2003, the inspectors observed an emergency planning (EP) evaluated drill in the simulator. In the scenario, the plant experienced a station blackout (loss of all offsite and onsite emergency power). After approximately 13 minutes, the shift manager (SM) classified the event as an alert. The Station Blackout condition existed for approximately 41 minutes. At no time during the drill was a site area emergency declared.

The CCNPP EALs specify that a site area emergency be declared if Emergency Operating Procedure (EOP)-7, "Station Blackout," is implemented AND power is not restored to at least one Safety-Related 4kV bus per Unit within 15 minutes. Operations Standing Order (SO)-02-04 provides guidance to make emergency classifications if the EAL initiating conditions exist without first completing EOP-0, "Post-Trip Immediate Actions," or implementing the next EOP. During the training exercise, the guidance provided in the SO was not implemented by the operators. Although the station blackout EOP had not yet been implemented, the blackout condition existed for greater than 15 minutes and a site area emergency was not declared. Contributing causes for the failure to make a correct and timely emergency classification were that: (1) the operating crew was not scheduled to complete the training on SO-02-04 until after the completion of the LORT cycle that contained the observed simulator session, and (2) the current EAL guidelines are constructed in a manner that requires additional administrative guidance (SO-02-04) for successful implementation. The licensee's emergency planning staff indicated that they plan to conduct a review of the Calvert Cliffs EALs and incorporate identified improvements as required.

The operations training staff's drill critique of the crew's emergency classification was also inconsistent with the guidance provided in the SO and was initially accepted as satisfactory for the NRC drill/exercise performance indicator. After discussions with the NRC, review of a time line of the event and SO-02-04, and a re-evaluation of the crew's

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actions, CCNPP's operations training staff re-evaluated the NRC's drill/exercise performance indicator opportunity as unsatisfactory based upon the conditions available to the crew. Therefore, this finding represents a weakness with the drill critique process where there is a limited team of evaluators (e.g., operator training simulator drill).

Analysis. This finding is under the emergency preparedness cornerstone. The finding is a weakness in the drill critique with a limited team of evaluators. This issue was determined to be more than minor because if left uncorrected it could become a more significant safety concern regarding the potential untimely notification of the public of an emergency. The significance of this findings was evaluated using the emergency preparedness significant determination process (NRC Inspection Manual Chapter (IMC) 0609, Appendix B). IMC 0609, Appendix B, Section 4.14, provides guidance on determining the safety significance of drill critique weaknesses. Since this finding represents a drill critique process, that failed to identify a weakness associated with a planning standard during a limited facility interaction drill, where there is a limited team of evaluators (e.g., operator training simulator drill), the significance of this finding is very low safety significance (Green).

Enforcement. 10 CFR Appendix E, IV, F., 2., (g) states that "All training, including exercises, shall provide for formal critiques in order to identify weak or deficient areas that need correction. Any weaknesses or deficiencies that are identified shall be corrected."

Contrary to the above, on February 19, 2003, a training exercise critique failed to identify a weak area that needed correction. Because the failure to identify the drill weakness is of very low safety significance and has been entered into the corrective action program (IR4-016-290), this violation is being treated as a NCV, consistent with Section VI.A of the NRC Enforcement Policy: NCV 50-317; 318/03-02-01, Failure to Adequately Identify Emergency Drill Weakness

2. **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 controls for radiologically significant work areas. The inspector's review focused on areas and activities with higher radiological risk. The reviews in this area were inspected against the criteria contained in 10 CFR 19, 10 CFR 20, site TS, and applicable CCNPP protection radiation procedures.

The inspector reviewed exposure significant work areas and inspected ongoing and recently completed radiological work activities to evaluate the adequacy and

Enclosure

effectiveness of radiological controls. The work activities reviewed included: pressure washing under the reactor pressure vessel (RPV) head; conduct of under side inspections of RPV head penetrations; decontamination of Unit 2 reactor cavity following drain down; decontamination of the head lay down area; work activities associated with the Unit 2 steam generator replacements; work activities on the reactor coolant pumps; and, electric destructive machining (EDM) of fuel elements.

The inspections included reviews of: radiological surveys (e.g., airborne radioactivity, loose and fixed surface contamination, and beta and gamma radiation dose rates) associated with the work; stay time calculations (as appropriate); conformance with applicable special work radiation permits; use of engineering controls; internal and external exposure controls; discrete radioactive particle controls; use of operating experience; and, completion of internal exposure assessments (as necessary). The inspector also reviewed CCNPP's detection and monitoring practices for dose rate gradients that could produce non-uniform occupational exposures and the adequacy of electronic dosimetry alarm set points (integrated dose and dose rate). In addition, the inspector reviewed the fractional mix of radionuclides present to determine the adequacy of internal and external exposure controls. In particular, the inspector focused on the potential for airborne transuranics.

The inspector made tours in radiological controlled areas (RCA) and made radiation measurements to determine current ambient conditions, adequacy of posting and barricading of high radiation areas, (HRA) adequacy of radiation protection job coverage, whether licensee surveys and general postings were complete and accurate, and whether air samplers were properly located for representative air sampling. The inspector questioned workers and radiological controls personnel, during the in-plant tours, to ascertain their knowledge and understanding of ambient radiological conditions and applicable radiological controls.

The inspector reviewed occupational exposures for workers: to determine if workers received unplanned internal or external exposures; to identify maximum occupational doses received; and to verify applicable radiological controls were adequate for conditions present. The inspector reviewed and discussed personnel external contamination results.

The inspector reviewed access and egress controls to and from RCA including personnel contamination monitoring practices.

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 program to reduce occupational radiation exposure to as low as is reasonably achievable (ALARA). The following matters were reviewed against criteria contained in 10 CFR 19, 10 CFR 20, site TS, and applicable site procedures.

The inspector reviewed CCNPP's performance in the area of occupational exposure reduction for Unit 2. The inspector reviewed occupational exposures sustained relative to applicable goals. Tasks reviewed included radiation safety coverage, maintenance activities, scaffolding, reactor assembly and disassembly, and RPV head penetration work. Also reviewed were the results achieved for CCNPP's shutdown chemistry control. The review was with respect to information contained in the Health Physics (HP) Section Pre-outage Report and applicable ALARA reviews.

The inspector toured the Unit 2 containment, observed ongoing work activities and interviewed workers to ascertain if ongoing activities, and worker and radiation protection personnel performance, were consistent with occupational reduction practices as specified in applicable ALARA reviews.

The inspector attended various outage and planning meetings. The inspector attended the integrated pre-job briefing on March 5, 2003, for electric destructive machining of fuel assemblies. The inspector also attended the Unit 2 outage status meeting on March 5.

b. Findings

No findings of significance were identified.

4. **OTHER ACTIVITIES**

4OA1 Performance Indicator (PI) Verification

The inspectors reviewed performance indicator (PI) data for the cornerstones listed below and used NEI 99-02, "Regulatory Assessment Performance Indicator Guidance," to evaluate verify individual PI accuracy and completeness.

.1 Drill and Exercise Performance (DEP)

a. Inspection Scope

NRC inspectors conducted an Emergency Planning (EP) program inspection (NRC Inspection Report No. 50-317; 318/02-010) in July 2002, in which the DEP PI could not be completed due to the unavailability of the documentation that supported the PI data. The issue was entered into the CCNPP's corrective action system and was treated as

Enclosure

an Unresolved Item (**URI 50-317; 318/02-010-03**). During an EP supplemental inspection conducted during January 27-30, 2003, the inspector reviewed CCNPP's actions to resolve the URI and the last two quarters of the DEP PI data to verify its accuracy.

b. Findings

Since the previous inspection, the Emergency Planning Group has been receiving the emergency action level classification and notification forms from the license operator requalification training (LORT) records which provided the needed information for maintaining the DEP PI. LORT makes up approximately 80% of the DEP PI data. The inspector reviewed the forms and was able to verify that the submitted DEP PI data was correct. This Unresolved Item (**URI 50-317; 318/02-010-03**) is closed.

.2 Units 1 and 2 – Reactor Coolant System (RCS) Activity

a. Inspection Scope

The inspectors reviewed PI data for the barrier integrity cornerstone, "RCS Activity," for Units 1 and 2, to verify individual PI accuracy and completeness. The inspectors verified the maximum monthly Iodine-131 RCS activity for the month of January 2001 through December 2002 and verified the TS limiting value. On March 12, 2003, the inspectors also observed the sampling and analysis of reactor coolant for Iodine-131 dose equivalent, in accordance with procedures CP-401, "Nuclear Steam Supply System Sampling," and CP-935, "Determination of Reactor Coolant Isotopic Activity."

b. Findings

No findings of significance were identified.

4OA2 Problem Identification and Resolution (PI&R)

.1 Safety Injection Check Valve Testing

a. Inspection Scope

The inspectors reviewed CCNPP's actions to address NRC Unresolved Item (**URI 50-317; 318/2002-06-02**). This URI was opened pending further NRC review of CCNPP's evaluation and resolution of safety injection check valve (1-SI-138-CHV) operability and seat leak testing methodology issues raised in IR3-061-844. The seat leakage test is performed by pressurizing the piping downstream of the check valve, depressurizing the piping upstream of the check valve, and then measuring any resulting pressure increase in the upstream piping. The check valve did not meet the acceptance criteria during the June 15, 2002 test, so the operators manually exercised the valve and re-performed the test. The CCNPP Plant Operations Safety Review

Committee questioned whether the valve could meet the surveillance test acceptance criteria and be considered operable if the valve had to be exercised before testing.

The inspectors reviewed an engineering memo dated March 7, 2003, that addressed the operability of the check valve and the validity of the test procedure. Engineering personnel addressed the operator actions and potential preconditioning concerns. The memo concluded that the valve was operable. Engineering personnel also initiated engineering service package (ESP) ES200300064 to calculate and document the basis of the surveillance test procedure seat leakage acceptance criteria. Specifically, engineering personnel calculated that the check valve could not be leaking greater than the acceptance criteria of 2 gallons per minute if the upstream pressure increase remained below 40 psig. Engineering personnel also calculated and documented that the drain path used to measure the seat leakage was not overly restrictive and did not mask a greater leak rate. The inspectors reviewed ES200300064 to independently verify the technical adequacy and correctness of the calculations.

The ESP revision initially provided to the inspectors had a non-conservative mathematical error in the calculation correlating leak rate and pressure increase. CCNPP identified this error prior to the inspectors' review and entered this issue into the CCNPP corrective action program (IR4-007-855). The ESP was revised and demonstrated that the test method was still valid, i.e., a small amount of leakage would still cause a noticeable increase in pressure. This Unresolved Item **(URI 50-317; 318/2002-06-02)** is closed.

b. Findings

No findings of significance were identified.

.2 Occupational Radiation Safety PI&R

a. Inspection Scope

The inspector reviewed the actions on various self-identified issues documented in the corrective action program, as issue reports, to determine if self-identified issues were being identified, prioritized, and corrective actions were being established and implemented (IR Nos. IR4 -012-734, IR4-012-840, IR4-015-348, IR4-009-630). The inspector also reviewed various audits and assessments including: 2003 Refueling Outage Assessment Plan; Quality and Performance Assessment Unit observations; and Unit 2 steam generator surveillance field notes.

b. Findings

No findings of significance were identified.

.3 Steam Generator Replacement Project and ISI PI&R

a. Inspection Scope

The inspectors reviewed corrective action documents associated with the Steam Generator Replacement Project (SGRP) to ensure that CCNPP was identifying, evaluating, and correcting problems associated with these areas and that the corrective actions for the issues were appropriate. The inspectors also reviewed SGRP related quality assurance surveillance activities at the plant site.

The inspector reviewed a number of corrective actions generated by the ISI personnel to determine if conditions warranting attention were being reported and corrected at an appropriate threshold. These corrective actions covered the discovery of indications, degraded components, as well as problems identified within the ISI program.

b. Findings

No findings of significance were identified.

.4 Cross-Reference to PI&R Findings Documented Elsewhere

Section 4OA3.1 describes that CCNPP's corrective actions for the 22 saltwater (SW) pump breaker auxiliary SBM - type switch failure in August 2002 were untimely and inadequate to prevent recurrence of a SBM-type auxiliary switch failure on the 1B EDG output breaker in January 2003. Additionally, CCNPP's identification of the extent of condition of the defective materials and corrective actions identified have been inadequate and incomplete since CCNPP's review of industry operating experience regarding General Electric (GE) SBM switches in 1996.

4OA3 Event Follow-up

.1 (Closed) LER 50-317/03-01-00, Failure of 4kV GE Breaker Due to Cracking in Auxiliary Switch Cam Follower

a. Inspection Scope

The inspectors reviewed LER 50-317/03-01-00 and Issue Reports IR4-014-321 and IR4-003-242, which documented this event in the corrective action program. The inspection was conducted to verify that the cause of the 1B EDG output breaker's failure to close event on January 6, 2003, was identified and the corrective actions were reasonable.

b. Findings

Introduction. A Green self-revealing NCV for inadequate and untimely corrective actions to prevent recurrence of SBM-type auxiliary switch failures as required by 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action." The finding is considered a PI&R

Enclosure

cross-cutting issue due to the failure to prevent recurrent SBM-type switch failures and due to inadequate and incomplete extent of condition reviews since CCNPP's review of industry operating experience regarding GE SBM switches in 1996.

Description. On January 6, 2003, the 1B EDG output breaker failed to close on demand during a TS required surveillance test. The last satisfactory surveillance test of the breaker occurred on December 9, 2002. The breaker was a GE Magna-Blast type breaker. Calvert Cliffs personnel inspected the breaker and found that an auxiliary switch (SBM type) internal to the breaker had a broken cam follower. Results of the visual inspection revealed noticeable cracking of the cam follower material in all of the SBM switches removed from the 1B EDG output breaker. The cam follower was constructed of a clear polycarbonate (Lexan) material with a steel roll pin in the center. The broken cam follower caused a contact in the closing coil circuit to fail in the open position and caused the breaker's failure to close.

LER 50-317/03-01-00 states that the root cause of this event was found to be low cycle fatigue stress cracking of the SBM model auxiliary switch Lexan cam follower. The corrective actions identified by LER 50-317/03-01-00 included inspecting all potentially affected safety-related breakers with the exception of seven breakers currently providing power to vital 4kV buses required by TS. These breakers are currently operable (Report Section 1R15) and do not have a safety function to close or load shed. For the breakers inspected, all SBM switches with clear Lexan cam followers were replaced with updated SBM switches or SB-12 switches that are not believed to be susceptible to the same failure mode.

LER 50-317/03-01-00 also states that an SBM model switch failed (IR4-004-854) by the same apparent failure mode in August 2002. The Magna-Blast breaker for the 22 SW pump closed on demand, but the control circuit was lost and the breaker had to be tripped manually. The 22 SW pump breaker has a safety function to load shed and re-close following an EDG start after a loss of normal power to the pump's associated vital 4 kV bus. The CCNPP evaluation for IR4-004-854 (AIT IR200200613) concluded that maintenance procedures should be revised to inspect SBM switches in 4 kV breakers and switchgear for clear Lexan cams. The changes to active procedures were made in February 2003 and met the scheduled due date of March 2003. The changes applied to inspections of non-safety-related (4 kV) breakers and both safety-related and non-safety-related switchgear (4 kV breaker cubicles). Action for safety-related breakers were considered unnecessary since the GE Magna-Blast breakers were scheduled to be replaced with ABB breakers. The CCNPP corrective actions for the 22 SW pump breaker auxiliary (SBM) switch failure event were untimely and inadequate to prevent recurrence of a failure of a SBM auxiliary switch on the 1B EDG.

The inspectors' reviewed of two 1996 operating experience (OE) evaluations (4B199600220 and 4B1996000278) related to GE SBM switches. The OE referenced problems with SBM switches at LaSalle and Maine Yankee. Although at Maine Yankee, the problem was initially identified in 4kV breaker switches, inspection of SBM switches in other applications (control and hand switches) identified showed a high population of cracked Lexan cam followers. The OE identified that the failures were due to stress

Enclosure

cracking and aging with no evidence seen of hydrocarbons contributing to the failures. The inspectors identified additional OE in NRC IR 50-293/95-14 and NRC Part 21 Report 94196. CCNPP's 1996 operating experience evaluation report concluded that the OE was applicable to CCNPP. An issue report (IR1-013-119) was initiated to document the potential for the failure mechanism to affect switches at CCNPP. In response to IR1-013-119, system engineering prepared to replace the SBM switches in the GE Magna-Blast breakers with SBM switches having cams with an update material. The issue report IR1-013-119 and the associated action tracking item (AIT IR199600736) were closed without the switch replacements having been completed. The 1996 corrective actions were inadequate to identify and correct the SBM switches with clear Lexan cams before the auxiliary switch failures on the 22 SW pump and the 1B EDG. In 2003, IR4-003-460 was initiated to enter this issue in the CCNPP corrective action program.

The evaluation performed for AIT IR199600736 also noted that GE SBM switches were used in many applications at CCNPP; however, corrective actions were not specified since the failure of redundant switches was considered unlikely. Following the 2003 failure of the SBM switch in the 1B EDG output breaker, CCNPP initiated IR4-003-462 to inspect and replace control room SBM type switches with broken or cracked cam followers. The inspector reviewed and discussed maintenance order (MO) 0200300110 with CCNPP system engineering personnel. CCNPP had identified 135 safety-related SBM switches in use as control room handswitches. The completed MO inspected the switches to determine if they had clear Lexan cams. Of the 135 switches inspected, 97 had clear Lexan cam followers. The 2003 inspections were inadequate to determine if the cam followers had cracks. At the end of the inspection period, CCNPP system engineering personnel had not determined the population of the SBM switches in non-safety-related applications and had not determined whether any of these non-safety-related SBM type switches had a risk significant function. An engineering evaluation was ongoing to develop the scope and schedule of an equipment reliability program to inspect and replace, as necessary, the SBM switches with clear Lexan cams. The inspectors concluded that the extent of condition review for the 1996 OE and the more recent SBM switch failures has been inadequate to address SBM switches in applications other than 4 kV breakers and switchgear.

Analysis. The inspectors determined that this event was more than minor because, if left uncorrected, the finding would become a more significant safety concern. The failure of the 1B EDG breaker to close on demand on January 6, 2003, affected the availability and operability of one train of emergency power for mitigating systems. An investigation determined that the breaker was inoperable since the date of the last required TS surveillance test on December 9, 2002. The finding represented an actual loss of the safety function for the 1B EDG to be capable of providing emergency electrical power to the 14 4kV vital emergency bus for 28 days. A loss of safety function of a single train for greater than the TS allowed outage time of 72 hours requires a Phase 2 significance determination process (SDP) review. The inspectors initial Phase 2 SDP determined that the event was of low to moderate safety significance (White).

An NRR Senior Reactor Analyst (SRA) reviewed the SDP Phase 2 results and performed a SDP Phase 3 analysis using the NRC's Standardized Plant Analysis Risk (SPAR) model for Calvert Cliffs. The SPAR model required some modeling changes to better reflect current plant design and operation. This included crediting the Unit 2 motor driven auxiliary feedwater pump to supply the Unit 1 steam generators during a station blackout (no AC power) at Unit 1. In addition, the SRA adjusted emergency diesel generator common cause terms in the model to reflect that the other SBM switches for breakers that need to operate to mitigate plant events were functional. The change in core damage frequency using the adjusted SPAR model was very low (4 E-7). The SRA determined that the change in the large early release frequency was very small due to the robust design of CCNPP's containment buildings. CCNPP also performed a risk analysis of the performance deficiency and obtained similar results (3 E-7). CCNPP's risk evaluation also considered the risk contribution of external initiators (fire, high winds, earthquakes etc.). The SRA reviewed CCNPP's analysis and did not identify any deficiencies. Based on the above the SRA determined that this performance deficiency was of very low safety significance (Green).

The inspectors concluded that this finding was also a PI&R cross-cutting issue because CCNPP's corrective actions for the 22 SW pump breaker auxiliary (SBM) switch failure in August 2002 were untimely and inadequate to prevent recurrence of a SBM auxiliary switch failure on the 1B EDG output breaker in January 2003. Additionally, CCNPP's identification of the extent of condition of the defective materials and corrective actions identified have been inadequate and incomplete since CCNPP's review of industry operating experience regarding degraded and defective GE SBM switches in 1996.

Enforcement. 10 CFR 50, Appendix B, Criterion XIV, "Corrective Action," states that measures shall be established to assure that conditions adverse to quality, such as failures, malfunctions, defective material and equipment, and non-conformances are promptly identified and corrected. The measures shall assure that the cause of condition is determined and the corrective action taken to preclude repetition. The identification of the significant condition adverse to quality, the cause of the condition, and the corrective action taken shall be documented and reported to appropriate levels of management. Contrary to the above, CCNPP's corrective actions for the 22 SW pump breaker auxiliary (SBM) switch failure in August 2002 were untimely and inadequate to prevent recurrence of a SBM auxiliary switch failure on the 1B EDG output breaker in January 2003. Also, since CCNPP reviewed industry operating experience, in 1996, that identified defective clear Lexan material that could lead to age-related stress cracking and failure of GE SBM switches; CCNPP's identification of the extent of condition of the defective materials and corrective actions identified have been inadequate and incomplete. Because this failure to implement timely corrective actions is of very low safety significance and has been entered into the corrective action program (IR4-003-460), this violation is being treated as a NCV, consistent with Section VI.A of the NRC Enforcement Policy: NCV 50-318/03-02-02, Failure to Implement Adequate Corrective Action for Breaker SBM Switch Failures.

- .2 (Closed) 50-317 Unit 1 Reactor Vessel Water Level Monitoring System (RVLMS) Special Report dated February 21, 2003

On January 12, 2003, Unit 1 RVLMS, Channel A experienced a failure of the 29 inch level position sensor. This failure coupled with previous failures of the 19 inch and 50 inch position sensors resulted in Channel A being declared inoperable due to insufficient sensor positions available in the lower (plenum) region. This failure was documented in the CCNPP corrective action program (IR3-020-387). A root cause analysis is in progress by CCNPP but high resistance in the connectors is believed to be the cause of the failure. CCNPP plans to replace or refurbish the Channel A RVLMS sensor during the scheduled Unit 1 2004 refueling outage to return Channel A to operable status. Alternate methods of monitoring for core and RCS voiding, have been initiated by CCNPP as required by plant procedures. The special report was reviewed by the inspectors and no findings of significance were identified. The inspectors also reviewed the special report dated February 15, 2002 due to the inoperability of both Channel A and B of the Unit 2 RVLMS and the special report dated December 4, 2001 due to the inoperability of Channel A of the Unit 2 RVLMS. This special report is closed.

40A5 Other Activities

.1 Unit 2 - Steam Generator Replacement Radiation Safety

a. Inspection Scope

The inspector reviewed radiological controls for ongoing steam generator replacement work activities. The following matters were reviewed:

- current occupational exposure performance relative to goals and dose tracking;
- current project schedule and ALARA planning for steam generator cutting and removal activities;
- on-going radiological controls for work activities including: temporary shielding, contamination controls, adherence to radiation protection procedures including radiation work permits, and radioactive material management;
- surveillance and audits of work activities (See Section 40A2)

The review was against criteria contained in 10 CFR 19, 10 CFR 20, site TS, and applicable site and project procedures.

b. Findings

No findings of significance were identified.

.2 Unit 2 - Steam Generator Replacement Preparations

a. Inspection Scope

NRC Inspection Report 50-318/02-06, documented the inspectors' previous review of the Calvert Cliffs Unit 2 steam generator replacement project (SGRP) planning, evaluations of problems learned during other SGRPs and related project tasks, procedures, work packages, and 50.59 evaluations.

Enclosure

The inspectors reviewed the preparations and ongoing rigging operations, the removal of piping and hangar interferences, the demolition of the existing steam drum internals and the installation of temporary pipe supports. The inspectors observed the welding and installation of temporary pipe supports in containment. Minor design changes made to these temporary pipe supports to deal with unanticipated obstructions were also reviewed. On several occasions, the inspectors observed containment activities including scaffolding construction, equipment lifting and rigging operations. The redesign of the auxiliary crane mounting on the pressurizer block house was reviewed and the redesigned auxiliary crane mounting installation was examined.

Also during this inspection period, the inspectors reviewed the welding program, procedures for welding, training and performance qualifications for personnel performing welding, resolution of potential welding problems, the issue of weld wire to welders, and the control of welding were reviewed. The inspectors observed welding training on mockups of piping and steam generator girth welds. The procedures and plans for nondestructive examination (NDE) of completed welds were reviewed. The inspectors also reviewed the planning and testing to pre-verify the adequacy of the lifting and rigging for heavy loads.

b. Findings

No findings of significance were identified.

4OA6 Management Meetings

.1 Exit Meeting Summary

The inspectors presented the inspection results to Mr. Kevin Nietmann, Plant General Manager, and other members of CCNPP staff on April 17, 2003. CCNPP acknowledged the findings and observations presented. No proprietary information was identified.

.2 NRC Management Site Visit

On March 31, NRC Region I management including Mr. J. Wiggins and Mr. J. Trapp visited the Calvert Cliffs site and met with CCNPP senior management including Mr. P. Katz and Mr. K. Neitmann to discuss recent plant events and performance trends.

ATTACHMENT: SUPPLEMENTAL INFORMATION

Enclosure

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

P. Katz, Vice-President, Calvert Cliffs Nuclear Power Plant
 R. LeGrande, Assistant to Site Vice-President
 K. Nietmann, Plant General Manager
 D. Holm, Manager, Nuclear Operations
 M. Korsnick, Manager, Work Management
 J. Spina, Manager, Nuclear Maintenance
 S. Sanders, General Supervisor-Radiation Safety
 M. Geckle, Director, Nuclear Regulatory Matters
 G. Gwiazdowski, Director, Nuclear Security
 R. Szoch, General Supervisor, Plant Engineering
 B. Holston, Manager, Engineering Services
 Jim Dalrymple, SGRP, Project Manager
 Paul Pieringer, Director, Quality & Performance Assessment

LIST OF ITEMS OPENED, CLOSED AND DISCUSSED

Opened and Closed

50-317; 50-318/03-02-01	NCV	Operators failed to make an emergency action level (EALs) classification during a drill and the drill critique failed to appropriately identify the EAL classification error. (Section 1EP6)
50-317; 50-318/03-02-02	NCV	Untimely and inadequate corrective actions to prevent a recurrence of 4 kV breaker auxiliary (SBM) switch failure. (Section 4OA3.1)

Closed

50-317; 50-318/02-010-03	URI	Not verifying the DEP PI due to the actual supporting documentation not being available (Section 4OA1.1)
50-317;50-318/02-006-002	URI	Review of CCNPP's evaluation, and resolution for safety injection check valve operability and testing methodology (Section 4OA2.1)
50-317/03-01-00	LER	Failure of 4kV GE Breaker Due to Cracking in Auxiliary Switch Cam Follower (Section 4OA3.1)

LIST OF DOCUMENTS USED AND REVIEWED

Engineering Calculations - Section 1R15:

CA06124, "Formalized calculations performed for initial operability assessment of steam driven AFW pumps during initiation of IR3-082-665"

ES200200855, "AFW pump hold down bolts loading in support of IR3-082-665 operability assessment made 05/21/02"

ES200200591, "Revision of the seismic analysis to credit the AFW pump hold down bolts for the seismic loads"

NDE Reports - Sections 1R08 and 1R22:

Magnetic Particle Examination Data Sheet NDE-130-00-01 650-00-013

Ultrasonic Indication Data Sheet NDE-140-00-01

Liquid Penetrant Examination Data NDE-380-00-0

Liquid Penetrant Examination Data NDE-490-00

Liquid Penetrant Examination Data NDE-550-00

Liquid Penetrant Examination Data NDE-600-00-01

Liquid Penetrant Examination Data NDE-640-00-01

Liquid Penetrant Examination Data NDE-650-00-01

Ultrasonic Calibration Data Sheet NDE-390-00-01

Ultrasonic Calibration Data Sheet NDE-395-00-0

Visual Examination Report 2001BV378

Procedures - Sections 1R08, 1R22, 1EP6 and 4OA5:

ERPIP 3.0, Immediate Actions, Rev 27
FRAM-14 7/29/98
Procedure MN-3-120 Rev 5 ASME Section XI Repair/Replacement Program
QEP 12.6 dated 3/0/13 for Radiographic Examination
SGRP-PS4-UT-1, Rev. 0, Automated P-Scan UT of pipe welds
SGRP-UT-3, Rev. 0 Manual UT of Ferritic pipe welds
SGRP-UT-5, Rev. 0 Verification of RT indications by UT
Welding Procedure GT-SM/3.3-2, Rev. 6, for SG girth weld
QEP 10.5, Rigging and Handling, Rev. 1
QEP 11.1, Temporary Crane Installation, Rev. 1
SGRP Rigging & Handling Task Management Plan, Rev.1 (SGT)
SGRP Risk Management Plan, Rev. 0 (SGT)
SGRP Steam Drum Internals Task Plan, Rev.2 (SGT)
SGRP Small Bore Piping Task Plan, Rev. 0 (SGT)
MN-3-301, Boric Acid Corrosion Inspection Program

Drawings - Section 1R08:

DWG 12019-0076SH0001 Rev 0
DWG 12019-0076SH0001 Rev 0A
DWG 12019-0075SH0001 Rev 0A

Corrective Actions - Sections 1R08, 1R15 and 1EP6:

IR3-076-471 Spacers on bottom of restraint located inboard
IR3-071-565 Loose Bolt on Snubber 1-52-60
IR4-009-439 Duplicate MWO 1199805252 Closed
IR4-005-794 UT Tech did not report visually apparent indications
IR4-009-438 MWO 1200101315 Sent to history without RR review
IR4-004-702 Additional Guidance to prevent maintenance chocking supports
IR4-000-829 WPS P8-T Incorrect instruction for polarity
IR4-009-378 White Light Meters out-of-calibration
IR4-005-784 Boric Acid Walk down discovery
IR4-005-789 Boric Acid Deposit on ICI Flange 4
IR4-009-365 Boric Acid on I-RC-1180
Issue Report IR4-007-779, Electrical Emergency Action Level (EAL) Criteria
IR3-082-665
IR4-005-952
IR3-020-387

Regulatory and Industry References - Sections 1R22 and 4OA5:

Reg Guide 1.71. Welder qualification for limited accessibility
NRC Generic Letter (GL) 88-05, Boric Acid Corrosion of Carbon Steel Reactor Pressure Boundary Components In PWR Plants
Regulatory Guide 1.101, Emergency Planning and Preparedness for Nuclear Power Reactors
NUREG 0654/FEMA-REP-1, Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants
NEI-99-02, Regulatory Assessment Performance Indicator Guidance
NUMARC/NESP-007, Methodology for Development of Emergency Action Levels

Miscellaneous Documents - Sections 1R08, 1R15, 1EP6 and 4OA5:

WO 4940 - Welder Status Report dated 3/11/03
NDE Examination Plan dated 11/13/02
NDE Task Plan for U2 SGRP, Rev. 1
Lessons Learned lists for Welding, NDE and Rigging/handling dated 12/18/02
SGRP QA Assessment Plan, Rev. 0
SGRP Move-in/Move-out Task Management Plan, dated 11/22/02
WPS - 21640, Rev. 1, for FW piping
WPS - 1/3/F6NGHT3, Rev. 5, for RCS nozzle to piping.
Repair Replacement Plan 2002-2-065a
Repair Replacement Plan 2002-2-065b
Repair Replacement Plan 2002-2-065c
Repair Replacement Plan 2002-2-069
Weld Authorization Traveler MO 2200200044/MM-2-02-356
Weld Authorization Traveler MO 2200200044/MM-2-02-358
Receipt Inspection PO 402564
Mill Certificate 07940100
Calculation CA04450 Rev 0
Design Report 33-500 2032-00
Safety Evaluation Report ES 199801103
SE 00285 Rev 0 Plug Repair of Pressurizer Heater
Certificate Of Heat Treatment 307421 and 30746
NRC Inspection Reports 50-317/94-27 & 50-318/94-27 dated October 7, 1994
Nuclear Plant Operations Section Standing Order Number 02-04, Rev 2
NRC Letter from Daniel G. McDonald, NRR to Mr. Robert E. Denton, BG&E, dated April 12, 1994, regarding Emergency Action Levels Calvert Cliffs Unit 1 and Unit 2
ECR 650, Revised auxiliary crane anchorage mounting to address NCR 309
Maintenance Order #2200000944, Install polar crane rail splice
NCR 309, Pressurizer block house concrete cracks following Williams anchor installation for auxiliary crane pedestal installation
WP-2-1060, Reactor cavity deck pre-fabrication in support of S/G replacement activities
WP-2-2535A & B, Steam generator feedwater line temporary support
WP-2-3060A, Removal of supports for component cooling water piping near S/G 21
WP-2-5085, Installation of Auxiliary Crane, Change Notices 9 & 10

LIST OF ACRONYMS

AFW	Auxiliary Feed Water
ASME	American Society of Mechanical Engineers
CCNPP	Calvert Cliffs Nuclear Power Plant
DEP	Drill and Exercise Performance
EAL	Emergency Action Level
EP	Emergency Preparedness
ICM	Interim Compensatory Measures
IR	Inspection Report
IR	Issue Report
ISI	Inservice Inspection
LOOP	Loss of Offsite Power
LORT	License Operator Requalification Training
NCV	Non-Cited Violation
NEI	Nuclear Energy Institute
OI	Operating Instructions
PI	Performance Indicators
PI&R	Problem Identification and Resolution
RCA	Radiologically Controlled Area
RCS	Reactor Coolant System
RPV	Reactor Pressure Vessel
RV	Reactor Vessel
RVLMS	Reactor Vessel Water Level Monitoring System
SBO	Station Blackout
SDP	Significance Determination Process
SGRP	Steam Generator Replacement Project
SM	Shift Manager
SRA	Senior Reactor Analyst
SRW	Service Water
SW	Saltwater
TRM	Technical Requirements Manual
TS	Technical Specifications
UFSAR	Update Final Safety Analysis Report