

July 25, 2005

Mr. George Vanderheyden  
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 05000317/2005003 AND 05000318/2005003

Dear Mr. Vanderheyden:

On June 30, 2005, the US Nuclear Regulatory Commission (NRC) completed an inspection at your Calvert Cliffs Nuclear Power Plant Units 1 and 2. The enclosed integrated inspection report documents the inspection findings, which were discussed on July 6, 2005, with Mr. Dave Holm 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.

Based on the results of this inspection no findings of significance were identified. However, licensee-identified violations which were determined to be of very low safety significance are listed in this report. If you contest these non-cited violations, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator Region I; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at the Calvert Cliffs Nuclear Power Plant.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Website 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

Mr. George Vanderheyden

2

Docket Nos. 50-317, 50-318

License Nos. DPR-53, DPR-69

Enclosure: Inspection Report 05000317/2005003 and 05000318/2005003  
w/Attachments

cc w/encl:

M. J. Wallace, President, Constellation Generation

J. M. Heffley, Senior Vice President and Chief Nuclear Officer

President, Calvert County Board of Commissioners

C. W. Fleming, Esquire, Constellation Energy Group, Inc.

Director, Nuclear Regulatory Matters

R. McLean, Manager, Nuclear Programs

K. Burger, Esquire, Maryland People's Counsel

State of Maryland (2)

Mr. George Vanderheyden

3

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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. 05000317/2005003 and 05000318/2005003

Licensee: Constellation Generation Group, LLC

Facility: Calvert Cliffs Nuclear Power Plant

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

Dates: April 1, 2005 - June 30, 2005

Inspectors: Mark A. Giles, Senior Resident Inspector  
Joseph M. O'Hara II, Resident Inspector  
Brice Bickett, Reactor Inspector  
Nancy T. McNamara, Emergency Preparedness Inspector

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

## TABLE OF CONTENTS

SUMMARY OF FINDINGS .....	iii
REACTOR SAFETY .....	1
1R04 Equipment Alignment .....	1
1R05 Fire Protection .....	2
1R06 Flood Protection Measures .....	2
1R11 Licensed Operator Requalification Program .....	3
1R12 Maintenance Effectiveness .....	4
1R13 Maintenance Risk Assessments and Emergent Work Control .....	4
1R15 Operability Evaluations .....	5
1R19 Post-Maintenance Testing .....	5
1R22 Surveillance Testing .....	6
1EP4 Emergency Action Level (EAL) and Emergency Plan (E-Plan) Revision .....	6
1EP6 Drill Evaluation .....	7
OTHER ACTIVITIES .....	7
4OA2 Problem Identification and Resolution .....	7
4OA3 Event Follow-up .....	9
4OA5 Other .....	10
4OA6 Meetings, Including Exit .....	11
4OA7 Licensee-Identified Violations .....	11
SUPPLEMENTAL INFORMATION .....	A - 1
KEY POINTS OF CONTACT .....	A - 1
LIST OF ITEMS OPENED, CLOSED AND DISCUSSED .....	A - 1
LIST OF DOCUMENTS REVIEWED .....	A - 2
LIST OF ACRONYMS .....	A - 8

## SUMMARY OF FINDINGS

IR 05000317/2005003, 05000318/2005003; 04/01/2005 - 06/30/2005; Calvert Cliffs Nuclear Plant, Units 1 and 2; routine integrated report.

The report covered a three-month period of inspection by resident inspectors and announced inspections performed by a reactor inspector and an emergency preparedness inspector. 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

No findings of significance were identified.

B. Licensee-Identified Violations

Violations of very low safety significance, which were identified by the licensee, have been reviewed by the inspectors. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program. These violations and associated corrective actions are listed in Section 4OA7 of this report.

## REPORT DETAILS

### Summary of Plant Status

Unit 1 began the inspection period at 100 percent reactor power and remained unchanged until April 20, when reactor power was reduced to 93 percent to support scheduled cleaning and eddy current testing of the 13A condenser waterbox. Following the completion of maintenance, reactor power was increased to 100 percent on April 22. On May 2, power was reduced to 95 percent reactor power to support additional waterbox cleaning and was restored to 100 percent power on May 3. On June 3, reactor power was reduced to 85 percent for main turbine valve testing, then raised to 93 percent to support ultrasonic feed flow testing, and restored to 100 percent of June 4. On June 28, power was reduced to 82 percent in response to condenser differential temperature limits while performing condenser waterbox tube repairs. Once repairs were completed on June 29, the unit was restored to and remained at 100 percent for the rest of the inspection period.

Unit 2 began the inspection period at 100 percent reactor power and remained unchanged until June 10 when reactor power was reduced to 85 percent for main turbine valve testing. Following the completion of testing, reactor power was raised to 95 percent for computer maintenance. Reactor power was restored to 100 percent on June 11 and remained there for the remainder of the inspection period.

### **1. REACTOR SAFETY**

#### **Cornerstone: Initiating Events, Mitigating Systems, Barrier Integrity**

1R04 Equipment Alignment (71111.04Q - 3 samples)

#### 1. Partial System Walkdown.

##### a. Inspection Scope

The inspectors verified that selected equipment trains of safety-related and risk significant systems were properly aligned. The inspectors reviewed plant documents to determine the correct system and power alignments, as well as the required positions of critical valves and breakers. The inspectors verified that the licensee had properly identified and resolved equipment alignment problems that could cause initiating events or potentially impact the availability of associated mitigating systems. The applicable documents used for this inspection are located in the Attachment. The inspectors performed the following partial system walkdowns:

- 12B service water (SRW) heat exchanger during 12A SRW heat exchanger basket strainer inspection
- 13KV service bus 11 to 4KV service bus 21 transformer maintenance
- 21 salt water system header during 2-SW-5171, 21 emergency core cooling system (ECCS) air cooler outlet control valve (CV), maintenance

Enclosure

b. Findings

No findings of significance were identified

1R05 Fire Protection (71111.05Q - 3 samples)

1. Fire Area Walkdowns

a. Inspection Scope

The inspectors walked down accessible portions of the plant to assess the licensee's control of transient combustible material and ignition sources, fire detection and suppression capabilities, fire barriers, and related compensatory measures when required. The inspectors assessed the material condition of fire protection suppression and detection equipment to determine whether any conditions or deficiencies existed which could impair the availability of that equipment. The inspectors also reviewed administrative procedure SA-1-100, "Fire Prevention," during the conduct of this inspection. The inspectors toured the following areas important to reactor safety:

- Unit 1 service water pump room
- Unit 1 45 foot elevation 4160 volt vital switchgear room
- Unit 2 45 foot elevation 4160 volt vital switchgear room

b. Findings

No findings of significance were identified.

1R06 Flood Protection Measures (71111.06 - 1 External Sample and 3 Internal Samples )

1. Internal Flooding

a. Inspection Scope

The inspectors reviewed flood protection measures associated with internal flood events. These events were described in Calvert Cliffs Engineering Standard (ES)-001, "Flooding" and the UFSAR. The inspectors performed a walkdown of the following three areas which contain risk significant systems: ECCS pump rooms 101, 102, 118, and 119; SRW rooms 205 and 226; and auxiliary feedwater (AFW) pump rooms 603 and 605. The inspectors observed the condition of watertight doors, drain systems and sumps, penetrations in floors and walls, and room water level switches.

b. Findings

No findings of significance were identified.



## 2. External Flooding

### a. Inspection Scope

The inspectors reviewed flood protection measures associated with external flood events. These events were described in the UFSAR and the Individual Plant Examination of External Events (IPEEE). Flooding is addressed by the emergency response plan implementation procedures (ERPIP) 3.0, Attachment 20. The inspectors walked down risk significant areas at the site which included the intake structure and outside areas near plant structures. The inspectors inspected the integrity of watertight doors, floor drains, and penetrations for these selected areas.

### b. Findings

No findings of significance were identified.

## 1R11 Licensed Operator Requalification Program (71111.11 - 2 samples)

### a. Inspection Scope

The inspectors observed a licensed operator simulator training scenario conducted on May 17, 2005, in order to assess operator performance and the adequacy of operator requalification training. This training scenario involved the crew's evaluation of anticipated grid disturbances and the loss of component cooling water to containment. Based on these occurrences, the reactor was manually tripped by licensed operators since forced flow in the reactor coolant system could not be maintained via the reactor coolant pumps following the loss of cooling water. During this inspection, the inspectors focused on high-risk operator actions performed during implementation of the emergency operation procedures, emergency plan implementation, and classification of the simulated event. The inspectors evaluated the clarity and formality of communications, the implementation of appropriate actions in response to alarms, the performance of timely control board operations and manipulations, and the oversight and direction provided by the shift supervisor. The inspectors also reviewed simulator fidelity to evaluate the degree of similarity to the actual control room, especially regarding recent control board modifications.

The inspectors also observed an additional licensed operator simulator training scenario conducted on June 1, 2005. This scenario involved the crew's evaluation of a major grid disturbance during diesel generator testing which prompted the crew to terminate the test in accordance with approved station Abnormal Operating Procedures (AOP). The crew's assessment of an undervoltage condition on a safety-related vital bus required the tripping of the bus and the shedding of all associated loads. Subsequent to these actions, offsite power was lost. Throughout the scenario, the inspectors observed operator actions during implementation of the emergency operation procedures and emergency plans. The inspectors noted that the classification of the event was made correctly and all required communications protocols were met.

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness (71111.12Q - 2 samples)

a. Inspection Scope

The inspectors reviewed the licensee effectiveness in performing routine maintenance activities. This review included an assessment of the licensee's practices pertaining to the identification, scoping, and handling of degraded equipment conditions, as well as common cause failure evaluations, and the resolution of historical equipment problems. For those systems, structures, and components (SSC) scoped in the maintenance rule per 10 CFR 50.65, the inspectors verified that reliability and unavailability were properly monitored and that 10 CFR 50.65 (a)(1) and (a)(2) classifications were justified in light of the reviewed degraded equipment condition. The inspectors conducted this inspection for the following equipment issues:

- Loose shutter interlock pins associated with AREVA Cutler Hammer 480 volt breakers
- 2-CV-5171 (21 ECCS air cooler outlet CV) did not indicate full open when performing salt water flow verification PE on the salt water header

b. Findings

No findings of significance were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13 - 6 samples)

a. Inspection Scope

The inspectors reviewed the licensee's assessments concerning the risk impact of removing from service those components associated with the work items listed below. This review primarily focused on activities determined to be risk significant within the maintenance rule. The inspectors compared the risk assessments and risk management actions performed by station procedure NO-1-117, "Integrated Risk Management," to the requirements of 10 CFR 50.65(a)(4), the recommendations of NUMARC 93-01, Revision 2, "Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," Section 11, "Evaluation of Systems to Be Removed From Service," and approved station procedures. The inspectors compared the assessed risk configuration to actual plant conditions to evaluate whether the assessment was accurate and comprehensive. In addition, the inspectors assessed the adequacy of the licensee's identification and resolution of problems associated with maintenance risk assessments and emergent work activities. The inspectors reviewed the following selected work activities:

- 12A SRW heat exchanger basket strainer inspection

- 13KV Service bus 11 to 4KV service bus 21 transformer maintenance
- 22 Switchgear heating, ventilation, and air conditioning (HVAC) maintenance
- 22 Saltwater header out-of-service for preplanned maintenance activities
- Engineered Safety Feature Actuation System (ESFAS) channel "ZF" Bus 21/24 U/V sensor replacement maintenance activity
- 1B EDG out-of-service for replacement of MJ and MH switch associated with breaker 152-1406

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations (71111.15 - 2 samples)

a. Inspection Scope

The inspectors reviewed operability determinations to verify that the operability of systems important to safety was properly established and the affected components or systems remained capable of performing their intended safety function. The inspectors reviewed the selected operability determinations to verify they were performed in accordance with NO-1-106, "Functional Evaluation - Operability Determination," and QL-2-100, "Issue Reporting and Assessment." The following operability evaluations were reviewed.

- Potential detachment of the shutter interlock pin associated with AREVA Cutler Hammer 480 volt breakers
- Loose non-erected scaffolding components stored near safety related 12 & 22 atmospheric dump valves

b. Findings

No findings of significance were identified

1R19 Post-Maintenance Testing (71111.19 - 5 samples)

a. Inspection Scope

The inspectors observed and/or reviewed post-maintenance tests associated with the following work activities to verify that equipment was properly returned to service, and that appropriate testing was specified and conducted to ensure that the equipment was operable and could perform its intended safety function following the completion of maintenance. Post-maintenance testing activities were conducted as specified in station procedure MN-1-101, "Control Of Maintenance Activities." Post-maintenance test results associated with the maintenance activities listed below were reviewed.

- Repack 22 auxiliary feedwater pump outboard packing
- 21 Charging pump breaker replacement

- Replace 12 control room HVAC Hi/Lo pressure cutout switch O-PS-5351
- Replace K7 Relay on Unit 1 ADV circuit
- Replace ESFAS channel "ZF" Bus 21/24 U/V sensors

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing (71111.22 - 4 samples)

a. Inspection Scope

The inspectors observed and/or reviewed the surveillance tests listed below associated with selected risk-significant SSCs to verify that TS were properly complied with, and that test acceptance criteria was properly specified. The inspectors also verified that proper test conditions were established as specified in the procedures, no equipment preconditioning activities occurred, and that acceptance criteria had been satisfied. The following surveillance tests were reviewed:

- STP O-73C-1, Component cooling pump quarterly test (12 pump)
- STP O-5A-2, Auxiliary feedwater system quarterly surveillance test (23 pump)
- STP M-220G-2, 21 & 24 4kv undervoltage relay test
- STP O-8B-2, Test of 2B DG and 4kv bus 24 LOCI sequencer

b. Findings

No findings of significance were identified.

**Cornerstone: Emergency Preparedness (EP)**

1EP4 Emergency Action Level (EAL) and Emergency Plan (E-Plan) Revision

a. Inspection Scope (IP 71114.04 - 1 Sample)

During the period of April 01 - June 23, 2005, the NRC has received and acknowledged the changes made to Calvert Cliff's E-Plan in accordance with 10 CFR 50.54(q), which Constellation Generation had determined resulted in no decrease in effectiveness to the Plan and which have concluded to continue to meet the requirements of 10 CFR 50.47(b) and Appendix E to 10 CFR 50. The inspectors conducted a sampling review of the Plan changes which could potentially result in a decrease in effectiveness. This review does not constitute an approval of the changes and, as such, the changes are subject to future NRC inspection. The inspection was conducted in accordance with NRC Inspection Procedure 71114, Attachment 4, and the applicable requirements in 10 CFR 50.54(q) were used as reference criteria.

b. Findings

No findings of significance were identified.

1EP6 Drill Evaluation (71114.06 - 2 samples)

a. Inspection Scope

The inspectors observed control room simulator training exercises conducted on May 17, 2005, and on June 1, 2005, to assess licensed operators performance in the area of emergency preparedness. This training exercise focused on equipment failures and operator challenges that would typically exist during grid disturbance events followed by the loss of offsite power and station blackout events. The required procedural transitions and associated event classifications were observed and evaluated by the inspectors.

b. Findings

No findings of significance were identified.

**4. OTHER ACTIVITIES**

4OA2 Problem Identification and Resolution

1. Corrective Action Review by Resident Inspectors

a. Inspection Scope

Continuous Review

The inspectors performed a daily screening of items entered into the licensee's corrective action program as required by Inspection Procedure 71152, "Identification and Resolution of Problems." The review facilitated the identification of potentially repetitive equipment failures or specific human performance issues for follow-up inspection. It was accomplished by reviewing each issue report and attending daily screening meetings, and accessing the licensee's computerized database.

Semi-Annual Problem Identification and Resolution (PI&R) Review

The inspectors performed an in-depth, semi-annual, PI&R review of licensee documents written from January 2005 through June 2005 to verify that the licensee is identifying issues at the appropriate threshold, entering them into the corrective action program, and ensuring that there are no significant adverse trends outside of the corrective action program which would indicate the existence of a more significant safety issue.

The inspectors reviewed licensee PIs, self-assessment reports, quality assurance

audit/surveillance reports, corrective action reports, and system health reports and compared the results of the review with results reported in the NRC baseline inspection program. Additionally, the inspectors evaluated the reports against the requirements of the Constellation Nuclear's Corrective Action Program (CAP) as delineated in QL-2, "Self-Assessment/Corrective Action Program."

b. Findings

No findings of significance were identified.

2. 12 Component Cooling Water Heat Exchanger (CCHX) Design Basis Analysis (71152 - 1 sample)

a. Inspection Scope

The inspectors completed one sample which reviewed the licensee's evaluation and corrective actions for the April 16, 2004, event when control room operators operated the 12 CCHX in excess of design shell-side flow limits that severed six tubes in the CCHX. Issue report IR4- 030-055 and updated flow calculations were selected for detailed review to ensure that the full extent of the issue was understood and addressed in Calvert Cliff's corrective action program. These reports documented Constellation's root cause analysis, updated CCHX design control, and identified corrective actions to prevent recurrence. Included in this review was the station's response to NCV 05000317/2004-05-02, inadequate design control, and updated design basis for the component cooling water heat exchangers. The inspectors reviewed issue reports, station procedures, an operability determination, flow modeling calculations, and interviewed station personnel to ensure an appropriate causal analysis was performed, corrective actions were identified, and the updated CCHX design basis was appropriate.

b. Findings

No findings of significance were identified.

The licensee's root cause analysis identified several operating experience documents, issued prior to the event at Calvert Cliffs, that identified similar heat exchangers tube vibration problems. The inspector noted that the licensee's root cause evaluation did not thoroughly document if this information could have been used to avert the tube failures at Calvert Cliffs.

4OA3 Event Follow-up

1. (Closed) Licensee Event Report (LER) 50-318/2005-01, Ultrasonic Testing Identifies Two Alloy 600 Nozzles Requiring Repair

On February 24, 2005, during ultrasonic inspections of the reactor coolant system (RCS) alloy 600 penetrations which were being conducted in accordance with the licensee's in-service inspection (ISI) program, two RCS nozzles were identified with indications of flaws. Corrective actions included the use of a weld overlay repair technique to restore both nozzles to the American Society of Mechanical Engineers (ASME) Section XI compliance. As a result of these identified defects, the licensee performed five additional ultrasonic test (UT) examinations which did not reveal any defects. The inspectors reviewed the UT results and conducted discussions with site personnel. NRC regional inspectors, as well as engineering personnel at NRC headquarters, reviewed this event since code relief for the repair methodology was required prior to startup of the unit. The LER was reviewed by the inspectors and no findings of significance were identified. The licensee documented the event in Issue Report IRE 003-469. This LER is closed.

2. (Closed) LER 05000317/2005002-02, Reactor Scram Due to Main Turbine Vibrations During Power Reduction

On March 1, 2005, Unit 1 was manually tripped during a scheduled reduction in power in accordance with AOP -7E, "Main Turbine Vibration." The reactor trip was initiated to protect the main turbine and generator due to high vibrations which reached the reactor trip threshold. The reactor trip was uncomplicated, and all alarms received were expected. The turbine vibrations were located in the #5 bearing of the Unit 1 "B" low pressure turbine, and were the result of rubbing between the "B" rotor and end packing which resulted in thermal distortions of the rotor. The turbine was placed on the turning gear. The LER was reviewed by the inspectors and no findings of significance were identified. The licensee documented the event in their corrective actions program as IRE-003-654. This LER is closed.

3. (Closed) LER 05000318/2005002-00, Personnel Air Lock Containment Penetration Closure Requirements Violation

On March 6, 2005, plant personnel identified a condition prohibited by technical specifications where the Personnel Air Lock (PAL) doors to the Unit 2 containment building were opened and unmanned during control element assembly coupling (core alterations). In this condition, technical specifications require the PAL to be under administrative controls whereby a dedicated watchstander can secure one of the PAL doors in the event of a fuel handling accident. The licensee had no dedicated watchstander in place during the core alteration evolution for approximately four and a half hours. The licensee determined the root cause of the deficiency is not having a formal process for documenting and communicating the transfer of one closure control method to another. Corrective actions consisted of licensee changes to the procedural



controls for closure deviations and a requirement for an interaction between the fuel handling supervisor and the PAL watchstander. The LER was reviewed by the inspectors and no findings of significance were identified. The licensee documented the event in their corrective actions program as IRE-003-998. This LER is closed.

4. (Closed) LER 05000317/2005001-00, Main Feedwater Isolation Valve Inoperability Due To Handswitch Wiring

On April 10, 2004, the licensee identified that the 12 main feedwater isolation valve, 1-FW-4517-MOV was inoperable when it failed to stroke during a scheduled surveillance test. The licensee determined that the failure was due to improper wiring associated with handswitch 1HS4517. A loose lead had been landed improperly when it was found disconnected on June 16, 2002. Following the test failure, the licensee landed the lead correctly and performed a satisfactory post-maintenance test to demonstrate operability of the valve. The licensee determined that the root cause of this event was the lack of proper application of human performance event free tools as well as the failure to notify supervision when the loose wire was found to ensure adequate direction or guidance was provided. The inspectors reviewed this event and determined that one minor violation of TS 3.7.15, main feedwater isolation valves, occurred. Because this violation was of minor significance, it is not subject to enforcement actions in accordance with Section IV of the NRC Enforcement Policy. See Section 4OA7 regarding an associated NCV. This event was documented in the licensee's corrective action program as IR4-029-980 and IRE0000-370. This LER is closed.

4OA5 Other

1. TI 2515/163, Operational Readiness of Offsite Power

a. Inspection Scope

The inspectors performed Temporary Instruction 2515/163, *Operational Readiness of Offsite Power*. The inspectors collected and reviewed licensee procedures and supporting information pertaining to the offsite power system specifically relating to the areas of offsite power operability, the maintenance rule (10 CFR 50.65), and the station blackout rule (10 CFR 50.63). The inspectors reviewed this data against the requirements of 10 CFR 50.63; 10 CFR 50.65; 10 CFR 50 Appendix A General Design Criterion 17, *Electric Power Systems*; and Plant Technical Specifications. This information was forwarded to NRR for further review.

b. Findings

No findings of significance were identified.

2. (Closed) URI 50-317,318/2004-05-03, Review of Updated CCHX Design Basis Analysis

On April 16, 2004, during shutdown cooling operations, Calvert Cliffs had the



component cooling water system in a configuration that allowed excessive shell-side flow through the CCHX that eventually severed six tubes attributable to high-cycle fatigue. The NRC resident inspectors documented one design control violation (NCV 50-317/2004-05-02) and identified potentially non-conservative design basis analysis for CCHX post-accident flow conditions. The inspectors reviewed issue reports, updated design basis information, and updated flow modeling calculations, including station personnel interviews, to verify the updated design basis information was adequate and the station's CCHX design basis bounded all potentially adverse flow conditions that the CCHX could experience.

The inspectors reviewed this Unresolved Issue (URI) and documented the inspection results in Section 4OA2 of this report. This URI is closed.

#### 4OA6 Meetings, Including Exit

On July 6, 2005, the inspectors presented the inspection results to Mr. Dave Holm, and other members of his staff, who acknowledged the findings.

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 violations of very low safety significance were identified by the licensee and are violations of NRC requirements which meet the criteria of Section VI of the NRC Enforcement Policy, NUREG-1600, for being dispositioned as NCVs.

- Technical Specification 3.9.3, Containment Penetrations, requires that the personnel air lock be closed or open under administrative controls during core alterations. Contrary to this, on March 6, 2005, the doors were opened without a designated watchstander tasked with closing the door if required. The doors remained uncontrolled without a designated watchstander for approximately four and a half hours during core alterations. The licensee identified this in their corrective action program as IRE-003-998. This finding is of a very low safety significance because it did not represent an actual unplanned or uncontrolled release of radioactivity to the environment and no fuel handling abnormalities or events occurred. (Section 4OA3.3).
- Technical Specification 3.7.15, Main Feedwater Isolation Valves (MFIVs), limiting conditions for operation, stated that two MFIVs shall be operable, and that one or more MFIVs may be inoperable for up to 72 hours while in Modes 1, 2, or 3. If this condition cannot be met, the unit is to be in Mode 3 within 6 hours and in Mode 4 within 12 hours. Contrary to this requirement, the inability of 1-FW-4517-MOV to close on a SGIS signal caused the valve to be inoperable from June 16, 2002, when the lead was improperly landed, until the unit was shutdown and entered Mode 4 on April, 2004, for a planned refueling outage. This issue is of a very low safety significance because redundant measures,

including the tripping of the main feed pumps and the closure of the main feedwater regulating valves, although not credited in the UFSAR accident analysis, would have provided steam generator isolation during a high energy line break upstream of the main steam isolation valves or downstream of the main feedwater isolation valves. It has been entered into the licensee's corrective action program as IR4-029-980. This violation of TS 3.7.15 is being treated as an NCV consistent with Section VI.A.1 of the NRC Enforcement Policy. (Section 40A3.4)

The following violation was identified by the licensee and is a Severity Level IV violation. It met the criteria of Section VI of the NRC Enforcement Policy, NUREG-1600, for being dispositioned as an NCV.

- 10 CFR 50.73, licensee event report (LER) system, states that holders of an operating license for a nuclear power plant shall submit a LER for any event of the type described in that paragraph within 60 days after the discovery of the event. The licensee identified that a main feedwater isolation valve stroke failure on April 10, 2004, was an event that met one of the types described in 10 CFR 50.73. That is, it met the reportability requirement for "any operation or condition which was prohibited by the plant's technical specification." Contrary to this reporting requirement, the licensee submitted this LER more than 330 days following the discovery of the event. Failure to submit the LER within 60 days constituted a violation of NRC requirements. Because the licensee restored compliance, the failure was not repetitive or willful, and was entered into the licensee's corrective action program as IRE-000-370, this violation of 10 CFR 50.73 is being treated as an NCV consistent with Section VI.A.1 of the NRC Enforcement Policy. (Section 40A3.4)

ATTACHMENT: SUPPLEMENTAL INFORMATION

## SUPPLEMENTAL INFORMATION

### KEY POINTS OF CONTACT

#### Licensee Personnel:

H. Evans, Health Physics Work Leader (Dosimetry)  
P. Furio, Regulatory Matters  
G. Gwiazdowski, Director, Nuclear Security  
M. Hacker, Areva Level III Reactor Head UT Analyst  
K. Hoffman, Dissimilar Metal Inspection Nightshift Supervisor  
D. Holm, Acting Plant General Manager  
E. Krehling, System Engineer  
L. Larragoite, Director of Licensing  
K. Mills, Operations General Supervisor  
M. Stanley, Safety Specialist  
G. Vanderheyden, Site Vice President  
J. York, Health Physics Supervisor (Support)  
M. Yox, Senior Emergency Analysis

### LIST OF ITEMS OPENED, CLOSED AND DISCUSSED

#### Closed

50-318/2005-01	LER	Ultrasonic Testing Identifies Two Alloy 600 Nozzles Requiring Repair (Section 4OA3.1)
50-317/2005-002-02	LER	Reactor Scram Due to Main Turbine Vibrations During Power Reduction (Section 4OA3.2)
50-318/2005-002-00	LER	Personnel Air Lock Containment Penetration Closure Requirements Violation (Section 4OA3.3)
50-317/2005-001-00	LER	Main Feedwater Isolation Valve Inoperability Due To Handswitch Wiring (Section 4OA3.4)
50-317,318/2004-05-03	URI	Review of Updated CCHX Design Basis Analysis (Section 4OA2.2)

## LIST OF DOCUMENTS REVIEWED

### Section 1R04: Equipment Alignment

#### 12B SRW Heat Exchanger During 12A SRW Heat Exchanger Basket Strainer Inspection

MO 1200406130, Perform inspection on 12A SRW heat exchanger basket strainer  
Clearance ID: 1200500300, System 011, Service Water Cooling  
OI-29, Saltwater System  
Drawing 60708, Sheet 3, Circulating Salt Water Cooling System

#### 13KV Service Bus 11 to 4KV Service Bus 21 Transformer Maintenance

MO 2200302734, Maintenance order associated with calibrating the 13KV voltage regulator.  
MO 2200402306, Maintenance order associated with the inspection of 13KV to 4KV feeder breaker.  
MO 2200402307, Maintenance order associated with checking the operation of 13KV to 4 KV transformer cooling control.  
MO 2200402308, Maintenance order associated with cleaning, inspecting, and testing the 13KV to 4 KV voltage regulator.  
MO 2200402325, Maintenance order associated with inspection of the 13KV to 4KV voltage regulator transfer switches.  
MO 2200402326, Maintenance order associated with calibration of the 13KV to 4KV transformer relays and test time delay relay.  
Drawing 61001SH0001, Electrical Main Single Line Diagram FSAR Fig. No. 8-1

#### 21 Salt Water Header during 2-SW-5171 ( 21 ECCS Air Cooler Outlet CV) Maintenance

IRE-005-032, 2-CV-5171 did not indicate full open when performing salt water flow verification  
MO2200304701, O/H Valve and Actuator 2CV5171  
RECO 2/17/05 2CV5171 (21 ECCS Cooler Outlet CV)  
IRE-003-289, 2-SW-5171 did not indicate full open in the control room during the performance of STP O -65N  
MO#2200500526, 2-SW-5171 did not indicate full open in the control room  
Unit 2 Reactor Operators Log, 2/17/05  
IRE-005-769, 2-SW-5171 did not indicate full open in the control room while performing salt water flow verification per OI-29 section  
Troubleshooting Control Form  
Unit 2 Reactor Operators Log, 5/18/05

### Section 1R05: Fire Protection

SA-1-101, Fire Fighting  
Fire Fighting Strategies Manual

## **Section 1R06: Flood Protection Measures**

Updated Final Analysis Report (UFSAR)  
Engineering Standard (ES) - 001, Flooding  
Emergency Response Plan Implementing Procedures (ERPIP) 3.0 Attachment 20, Severe  
Weather  
Calvert Cliffs Individual Plant Examination of External Events (IPEEE) Summary Report.

## **Section 1R12: Maintenance Effectiveness**

### Loose shutter interlock pins associated with AREVA Cutler Hammer 480 volt breakers

IRE-005-865, While attempting to start 21 charging pump for PE 2-41-3-O-W, 21 charging pump did not start  
PE 2-41-3-O-W, Rotating idle charging pumps  
MO 2200501943, Troubleshoot/repair the 21 charging pump  
MN-1-110, Interdepartmental troubleshooting procedure and rover maintenance  
FTE-29, Electrical functional test procedure  
Cutler-Hammer, "Instructions for Low-Voltage Power Circuit Breakers Types DS and DSL" manual, dated September, 1996  
Basis for Reasonable Expectation of Continued Operability (RECO) for Areva 480 volt breakers following 21 charging pump failure to start, dated May 27, 2005

### 2-CV-5171 (21 ECCS Air Cooler Outlet CV) did not indicate full open when performing salt water flow verification PE on the salt water header

IRE-005-032, 2-CV-5171 did not indicate full open when performing salt water flow verification  
MO2200304701, O/H Valve and Actuator 2CV5171  
RECO 2/17/05, 2CV5171 (21 ECCS Cooler Outlet CV)  
IRE-003-289, 2-SW-5171 did not indicate full open in the control room during the performance of STP O -65N  
MO#2200500526, 2-SW-5171 did not indicate full open in the control room  
Unit 2 Reactor Operators Log, 2/17/05  
IRE-005-769, 2-SW-5171 did not indicate full open in the control room while performing salt water flow verification per OI-29 section  
Troubleshooting Control Form  
Unit 2 Reactor Operators Log, 5/18/05

## **Section 1R13: Maintenance Risk Assessment and Emergent Work Control**

### 12A SRW Heat Exchanger Basket Strainer Inspection

MO 1200406130, Perform inspection on 12A SRW heat exchanger basket strainer  
Clearance ID: 1200500300, System 011, Service Water Cooling

### 13KV Service Bus 11 to 4KV Service Bus 21 Transformer Maintenance

MO 2200302734, Maintenance order associated with calibrating the 13KV voltage regulator.

MO 2200402306, Maintenance order associated with the inspection of 13KV to 4KV feeder breaker.

MO 2200402307, Maintenance order associated with checking the operation of 13KV to 4 KV transformer cooling control.

MO 2200402308, Maintenance order associated with cleaning, inspecting, and testing the 13KV to 4 KV voltage regulator.

MO 2200402325, Maintenance order associated with inspection of the 13KV to 4KV voltage regulator transfer switches.

MO 2200402326, Maintenance order associated with calibration of the 13KV to 4KV transformer relays and test time delay relay.

Drawing 61001SH0001, Electrical Main Single Line Diagram FSAR Fig. No. 8-1

## 22 Switchgear HVAC Maintenance

MO 2200401557, Calibrate 22 Switchgear HVAC Refrigeration Unit Pressure Controls

MO 2200404028, Clean 22 Switchgear HVAC Condenser Coil

MO 2200402232, Install Two Additional Schrader Service Fittings in 22 Switchgear HVAC Train

MO 2200403996, Replace Relief Valve on 22 Switchgear HVAC

MO 2200404749, Repair Refrigerant Leaks on Circuits 1 & 2 of 22 Switchgear HVAC

MO 2200404440, Perform Visual Inspection of 22 Switchgear HVAC Fan Bearings

Figure 12793-0001SH0018, Switchgear Room Ventilation & Air Conditioning Vent Unit 12 & 22

Figure 15869-0020SH0001, Line Mounted Components

Figure 60722SH0003, Auxiliary Building Ventilation System

Figure 60712SH0003, Compressed Air System Plant & Instrument Air

Figure 63085SH0009C, Schematic Diagram Heating & Ventilating SWGR Room A/C

Compressor 21 & 22

Figure 63085SH0009F, Schematic Diagram SWGR Room HVAC Unit 22 Control

Figure 63085SH0009P, Schematic Diagram Heating & Ventilating Switchgear RM. HVAC Unit 22 Fan

NO-1-117, Integrated Risk Management

## 22 Saltwater header out-of-service for preplanned maintenance activities

MO 2200304054, Replace the MH and MJ switches on breaker cubicle 152-2409 for 22 SRW pump

MO 2200403165, Install overhauled magne-blast breaker in cubicle 152-2409

MO 2200404070, Relocate wiring at breaker 152-2409 to correct wiring logic for computer point

MO 2200404666, Inspect 152-2409, 22 SRW pump motor and controls

MO 2200403632, Replace valve and associated piping components for 2HVSU-193

MO 2200404714, Remove, test, overhaul and reinstall 2-RV-5211

MO 2200404649, Replace elastomers in 2CV5158 actuator

MO 2200404671, Perform inspection of 22A basket strainer 2BS5158

## ESFAS channel "ZF"Bus 21/24 U/V sensor replacement maintenance activity

Reactor Operators Log

IR4-003-327, Undervoltage sensor bistables in ESFAS sensor channels could be susceptible to age related component failure.

MO# 2200300556, Replace ESFAS channel ZF u/v bus 21 and 24 sensor bistables

MO# 2200403975, STP -M - 220G-2, 21 & 24 4kv U/V relay functional test  
STP- \_ 20G -2, 21 & 24 4kv Undervoltage Relay Functional Test Rev. 3  
STP-I- 521-2, ESFAS Response Time Testing

1B EDG out-of-service for replacement of MJ and MH switch associated with breaker 152-1406

MO#1200302580, Replace MJ and MH switch 152-1406  
Reactor Operators Log  
QSS Converter/QSS Evaluator macro Basis 1B Emergency Diesel Generator OOS for planned maintenance (Unit 1 - Impact) Rev. 3  
QSS Converter/QSS Evaluator macro Basis 1B Emergency Diesel Generator OOS for planned maintenance (Unit 2 - Impact)  
QSS Converter/QSS Evaluator macro Basis OC Diesel OOS with another DG OOS

**Section 1R15: Operability Evaluations**

Potential detachment of the shutter interlock pin associated with AREVA Cutler Hammer 480 volt breakers

IRE-005-865, While attempting to start 21 charging pump for PE 2-41-3-O-W, 21 charging pump did not start  
PE 2-41-3-O-W, Rotating idle charging pumps  
MO 2200501943, Troubleshoot/repair the 21 charging pump  
MN-1-110, Interdepartmental troubleshooting procedure and rover maintenance  
FTE-29, Electrical functional test procedure  
Cutler-Hammer, "Instructions for Low-Voltage Power Circuit Breakers Types DS and DSL" manual, dated September, 1996  
Basis for Reasonable Expectation of Continued Operability (RECO) for Areva 480 volt breakers following 21 charging pump failure to start, dated May 27, 2005

Loose non-erected scaffolding components stored near safety related 12 & 22 ADV s

IRE-0004-877, The scaffold storage areas on the 45 ft. aux building have scaffold poles that come into contact with MS piping  
MN-1-106, Control of Equipment and Material in Safety Related Category I (SR-CACTI) Structures and Trip Sensitive Areas  
MN-1-203, Scaffold Control

**Section 1R19: Post-Maintenance Testing**

21 Charging Pump Breaker Replacement

IRE-005-865, While attempting to start 21 charging pump for PE 2-41-3-O-W, 21 charging pump did not start  
PE 2-41-3-O-W, Rotating idle charging pumps  
MO 2200501943, Troubleshoot/repair the 21 charging pump  
MN-1-110, Interdepartmental troubleshooting procedure and rover maintenance  
FTE-29, Electrical functional test procedure



Cutler-Hammer, "Instructions for Low-Voltage Power Circuit Breakers Types DS and DSL" manual, dated September, 1996

Basis for Reasonable Expectation of Continued Operability (RECO) for Areva 480 volt breakers following 21 charging pump failure to start, dated May 27, 2005

Replace 12 Control room HVAC Hi/Lo pressure cutout switch O-PS-5351

OI-22F, Control Room And Cable Spreading Rooms Ventilation

MO 0200501361, Replace 12 CR HVAC Hi/Lo pressure cutout switch, O-PS-5351

MO 0200402711, Perform calibration for 12 control room HVAC compressor instrument

Maintenance Procedure - I - 109, #12 Control Room HVAC Compressor Instrument Calibration

Repack 22 Auxiliary feedwater pump outboard packing

MO 2200500530 Repack 22 AFW outboard pump packing

STP O-5A-2, Auxiliary Feedwater system Quarterly Surveillance Test

Replace K7 Relay on Unit 1 ADV circuit

IRE-005-674, Unit One Channel X reactor regulating K-7 relay is chattering excessively

MO#1200400668, Replace K-type relays in reactor reg channels x and y with new ones from the vendor

MO#1200400669, Install Relay K-7 to support power requirements of steam dump control relay circuit

MO#2200400291, Replace K7 on channels x

MO#2200400659, Replace K-type relays in reactor reg channels x and y with new ones from the vendor

Replace ESFAS channel ZF Bus 21/24 U/V sensors

Reactor Operators Log

IR4-003-327, Undervoltage sensor bistables in ESFAS sensor channels could be susceptible to age related component failure.

MO# 2200300556, Replace ESFAS channel ZF UV bus 21 and 24 sensor bistables

MO# 2200403975, STP -M - 220G-2, 21 & 24 4kv UV relay functional test

STP- \_ 20G -2, 21 & 24 4kv Undervoltage Relay Functional Test Rev. 3

STP-I- 521-2, ESFAS Response Time Testing

**Section 1R22: Surveillance Testing**

12 Component Cooling Pump Quarterly Surveillance Test

STP O-73C-1, Component Cooling Pump Quarterly Test

23 Auxiliary Feedwater Pump Quarterly Surveillance Test

STP O-5A-2, Auxiliary Feedwater System Quarterly Surveillance Test



## 21 & 24 4kv Undervoltage Relay Test

STP M-220G-2, 21 & 24 4kv Undervoltage Relay Functional Test

## 2B Emergency Diesel Generator

STP O-8B-2, Test of 2B DG and 4kv Bus 24 LOCI Sequencer

## **Section 40A3: Event Followup**

### Ultrasonic Testing Identifies Two Alloy 600 Nozzles Requiring Repair

LER 2005-001, Ultrasonic testing identifies two alloy 600 nozzles requiring repair  
IRE-003-574, UT inspection revealed an axial indication on 2-LD-2004-1  
IRE-003-562, Calculated growth rates do not meet ASME Section XI code requirements  
IRE-003-469, UT results identified one circumferential indication at weld 2-DR-2007  
IRE-003-574, Postulated growth rates are large and do not meet ASME Section XI requirements

### Reactor Scram Due to Main Turbine Vibrations During Power Reduction

LER 2005-002-00, Reactor scram due to main turbine vibrations during power reduction  
IRE-003-654, While shutting down unit 1 to repair a steam leak, main turbine vibrations reached 12 mils (trip criteria for turbine vibration) and therefore the reactor was manually tripped followed by an automatic turbine trip

### Personnel Air Lock Containment Penetration Closure Requirements Violation

Category I Root Casual Analysis IR200500070, Technical Specification Requirements for Containment Closure were not established for core alterations (CEA coupling)  
IRE-003-998, The PAL door watch found unmanned from approx 1730 to 1830 on 3/6/05 by an operations refueling supervisor during core alterations  
LER 2005-002-00, Personnel air lock containment closure requirements violation

### Main Feedwater Isolation Valve Inoperability Due To Handswitch Wiring

LER 2005-001, Main Feedwater Isolation Valve Inoperability Due To Handswitch Wiring  
IR4-029-980, During performance of STP-0-56A-1, 1FW-4517-MOV failed to stroke  
IR4-030-027, During performance of STP-0-69-1, 1FW-4517-MOV failed to stroke  
IRE-000-370, Reportability review did not include all applicable criteria  
IRE-002-908, Failure to report a condition reportable under 10 CFR 50.73(a)(2)(i)(B)  
IR4-034-570, Benchmark industry best practices for determining the appropriate functional testing  
RM-1-101, Reporting Requirements  
Risk Assessment of 1MOV4517 failure to close conditions, dated February 11, 2005  
MO 1200202512, Perform maintenance on 1HS4517  
MO 2200201512, Perform post maintenance operational test of valve 1-MOV-4517  
MO 1200401636, Rework 1C03 panel wiring to clear up clutter

**Section 4OA5: Other**

TI 2515/163, Operational Readiness of Offsite Power

AOP 7M - Major Grid Disturbance  
TI 2515/163 "Operational Readiness of Offsite Power"  
NO-1-117 Integrated Risk Management  
AOP -7M, "Major Grid Disturbances," Basis Document Unit 1 and 2, Revision 1  
EOP - 7 Station Blackout, Technical Basis Document, Revision 19  
Calvert Cliffs Response to SOER 99-1, "Loss of Grid - Addendum"

**LIST OF ACRONYMS**

AOP	Abnormal Operating Procedures
AFW	Auxiliary Feedwater Pump
CAP	Corrective Action Program
CCHX	Cooling Water Heat Exchanger
CSAS	Containment Spray Actuating Signal
ERPIP	Emergency Response Plan Implementation Procedure
FSAR	Final Safety Analysis Report
IMC	Inspection Manual Chapter
IPEE	Individual Plant Examination of External Events
LER	Licensee Event Report
MFIVs	Main Feedwater Isolation Valves
NCV	Non-Cited Violation
PE	Performance Evaluation
PI	Performance Indicator
PI&R	Problem Identification and Review
SDP	Significance Determination Process
SGIS	Safeguards Initiation Signal
SSC	Systems, Structures and Components
SWP	Service Water Pump
TI	Temporary Instruction
TS	Technical Specifications
UFSAR	Updated Final Safety Analysis Report
URI	Unresolved Issue