

January 14, 2002

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

SUBJECT: CALVERT CLIFFS NUCLEAR POWER PLANT - NRC INSPECTION REPORT
50-317/01-13

Dear Mr. Cruse:

On December 13, 2001, the NRC completed a supplemental inspection at the Calvert Cliffs Nuclear Power Plant, Unit 1. During this inspection the NRC reviewed evaluations and corrective actions completed by your staff in response to a finding of substantial safety significance (Yellow), associated with the 11 Auxiliary Feedwater Pump Turbine bearing failure in May 2001. The results of this inspection were discussed with you, Mr. Katz, and other members of your staff during an exit meeting on December 13, 2001.

Based on the inspection results, the inspectors concluded your evaluations were of adequate detail to identify the underlying causes of this performance issue. The inspectors also concluded that your evaluations identified the extent of the conditions that led to this performance issue, and that your corrective actions, either completed or in progress, are appropriately broad to provide reasonable assurance the problems should not recur.

Due to your acceptable performance in addressing the inoperable auxiliary feedwater pump, the Yellow finding associated with this issue will only be considered in assessing plant performance for a total of four quarters in accordance with the guidance in NRC Manual Chapter 0305, "Operating Reactor Assessment Program." While the supplemental inspection is considered complete, the NRC plans to conduct a Regulatory Performance Meeting with you in accordance with the Action Matrix contained in Manual Chapter 0305. The purpose of the meeting is to discuss the status of your corrective actions, particularly your equipment reliability improvement initiative. This meeting will be held in conjunction with the annual public meeting. We will contact you to schedule a mutually convenient date.

Charles H. Cruse

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Sincerely,

/RA/

Wayne D. Lanning, Director
Division of Reactor Safety

Docket No. 50-317
License No. DPR-53

Enclosures: NRC Inspection Report 50-317/01-13

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Charles H. Cruse

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U.S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket No.: 50-317

License No.: DPR-53

Report No.: 50-317/01-13

Licensee: Calvert Cliffs Nuclear Power Plant, Inc.

Facility: Calvert Cliffs Nuclear Power Plant, Unit 1

Dates: December 10-13, 2001

Inspectors: M. Gray, Reactor Inspector
L. Cline, Resident Inspector
F. Jaxheimer, Reactor Inspector
P. Torres, Project Engineer

Approved By: David C. Lew, Chief
Performance Evaluation Branch
Division of Reactor Safety

SUMMARY OF FINDINGS

IR 05000317-01-13; on 12/10-12/13/01; Calvert Cliffs Nuclear Plant, Inc.; Calvert Cliffs Nuclear Power Plant, Units 1 & 2. Supplemental inspection concerning a degraded cornerstone in mitigating systems; Supplemental inspection for one degraded cornerstone.

The inspection was conducted by two regional inspectors and one resident inspector. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using IMC 0609 "Significance Determination Process" (SDP). Findings for which the SDP does not apply are indicated by "No Color" or by the severity level of the applicable violation. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described at its Reactor Oversight Process website at <http://www.nrc.gov/reactors/operating/oversight.html>.

Cornerstone: Mitigating Systems

This supplemental inspection was performed by the NRC to assess the licensee's evaluations associated with the 11 Auxiliary Feedwater (AFW) Pump Turbine bearing failure in May 2001. The bearing failed due to an error during maintenance where excessive sealant was applied to the bearing housing. This resulted in sealant intrusion into the bearing oil sump, which most likely blocked oil flow into the bearing. This performance issue was previously characterized as having substantial safety significance ("Yellow") in NRC letter to the licensee dated September 19, 2001.

Based on the inspection results, the inspectors determined that the licensee's evaluations were of adequate detail to identify the underlying causes of this performance issue. The licensee identified, in part, underlying causes in regard to over-reliance on the "skill of the craft," inadequate reinforcement of work practice expectations in following instructions, and unclear vendor manual direction. The licensee implemented corrective actions to improve control of sealant application to the AFW bearing housings, and was planning additional hardware enhancements to help ensure overall AFW system reliability. Additionally, the licensee was implementing broader corrective actions, described in their Equipment Reliability Improvement Project, to reinforce standards for adherence to maintenance order instructions and ensure an appropriate balance is being maintained between maintenance instruction detail and the level of skill of the craft required to perform the task.

The inspectors independently assessed the extent of the underlying conditions that led to the yellow finding to determine whether the licensee's evaluations had appropriately bounded the problem. In reviewing a sample of completed maintenance orders, the inspectors did not identify findings of safety significance. However, the inspectors did identify a minor instance of inadequate adherence to work instructions in regard to preventive maintenance on a saltwater pump, and two instances where work instructions included minimal detail, resulting in increased reliance on skill of the craft for critical aspects of the work. The inspectors determined these issues were similar to those the licensee identified in their extent of condition review, and would be addressed within the scope of the licensee's corrective actions, when fully implemented. As a result, the inspectors concluded the licensee's extent of condition review appropriately bounded the underlying conditions that led to the yellow finding, and supported the need for the broader corrective actions described in the licensee's Equipment Reliability Improvement Project.

Due to the licensee's acceptable performance in addressing the causes of the 11 AFW pump turbine bearing failure, the yellow finding associated with this issue will only be considered in assessing plant performance for a total of four quarters in accordance with the guidance of Inspection Manual Chapter 0305, "Operating Reactor Assessment Program."

REPORT DETAILS

01 Inspection Scope

This supplemental inspection was completed in accordance with NRC Inspection Procedure 95002 to assess the licensee's evaluations of a performance issue identified as having substantial safety significance (Yellow). This performance issue was associated with inadequate adherence to maintenance order instructions during assembly of the 11 AFW pump turbine bearings, which resulted in over-application of permatrix sealant to the bearing housings. Sealant entered the outboard bearing oil sump, and subsequently the bearing, most likely interrupting oil flow and causing a bearing temperature excursion during a pump test in May 2001. This condition impacted the capability of the 11 Auxiliary Feedwater Pump to operate for the time required to accomplish its safety function.

This condition was discovered by the licensee, and was the subject of Licensee Event Report (LER) 50-317/01-001, dated July 13, 2001. The NRC subsequently completed a special inspection of the event, and documented the results, including the yellow performance issue, in NRC Inspection Report 50-317/01-009, dated August 24, 2001. The performance issue was the subject of a Notice of Violation (NOV) issued to the licensee in NRC letter dated September 19, 2001. The licensee responded to the NOV in a letter dated October 18, 2001.

This supplemental inspection scope included the licensee's evaluations and corrective actions described in their letter responding to the NOV. The inspectors reviewed the licensee's evaluations specific to the performance issue, and additionally, their evaluations assessing overall AFW system reliability. The inspectors also reviewed the licensee's assessment of some examples of weak performance in the corrective action program identified during the special inspection. The inspectors further reviewed a sample of licensee maintenance activities, similar to the AFW bearing work, to independently assess the extent of the conditions that led to the performance issue. The inspectors considered the results in determining whether the licensee's evaluations appropriately bounded the underlying conditions that led to the performance issue.

02 Evaluation of Inspection Requirements

02.01 Problem Identification

- a. Determine that the evaluations identify who (i.e., licensee, self revealing, or NRC), and under what conditions the issues were identified.

The inspectors determined that the licensee's evaluations identified the circumstances and personnel involved in identifying the problem. The problem was self revealing when, during a quarterly pump surveillance test in May 2001, the 11 AFW pump turbine outboard bearing temperature indication increased rapidly. Operators secured the pump, and maintenance personnel subsequently disassembled the bearing and identified the over-application of sealant to the bearing housing.

- b. Determine that the evaluations document how long the issues existed, and prior opportunities for identification.

The inspectors determined the licensee's evaluations documented how long excessive sealant had been applied to the 11 AFW pump turbine bearing housing and prior opportunities to identify this condition. The licensee determined sealant over-application occurred during a plant refueling outage in March and April of 2000. During the outage in March 2000, the 11 AFW pump turbine overspeed test was completed, and the turbine bearings were then disassembled for visual inspection as a preventive measure. During reassembly of the bearings, an excessive amount of sealant was applied to the bearing housing, which most likely entered the bearing and resulted in the subsequent bearing temperature excursion and pump shutdown during a surveillance test in May 2001.

As described in the NRC special inspection report, the licensee determined there were two prior opportunities to identify this problem, and the NRC inspectors identified an additional opportunity. During the evaluation of a bearing failure problem in 1996, the licensee determined by visual inspection that sealant (RTV used at that time), had been over-applied to the bearing housings; however this did not cause the bearing failure. The licensee implemented a corrective action to allow use of permatex as a sealant; however, this did not prevent sealant intrusion into the bearing in May 2001. A second opportunity to identify this problem occurred in April 2000, when the 12 AFW pump turbine bearings were similarly inspected. During reassembly of the bearings, the vendor was present, and indicated to maintenance personnel that too much sealant was being applied to the bearing housings. While maintenance personnel appropriately applied less sealant to the 12 AFW bearing housings, the opportunity was missed to identify this condition on the 11 AFW turbine bearings reassembled by the same personnel the previous month.

An additional opportunity to identify this problem occurred in September 2000 following an automatic reactor trip. Operators removed the 11 AFW pump from operation after approximately two hours when the turbine outboard bearing temperature computer point indicated a potential abnormal condition may exist. The licensee entered the problem into the corrective action program and closed it to further trending, concluding temperatures were not significantly different than those previously observed. However, considering the 11 AFW outboard bearing temperature was marginally higher than in the past and higher than the other AFW outboard turbine bearings, and that the oil sample analyses from May 2000 and November 2000 indicated increased oil viscosity in the outboard turbine oil sump, the inspectors concluded an opportunity was missed to investigate the problem in greater detail and potentially identify sealant intrusion into the oil sump.

- c. Determine that the evaluations document the plant specific risk consequences and compliance concerns associated with the issues, both individually and collectively.

The inspectors determined the licensee's evaluations, as described in LER 50-317/01-001, document the plant specific risk consequences resulting from the over-application of sealant to the 11 AFW pump turbine outboard bearing housing. Based on inspections of the other AFW pump turbine bearing housings, a review of maintenance records, and personnel interviews, the licensee determined the over-application of sealant was limited to the 11 AFW pump turbine bearings. The licensee determined the over-application of sealant would have prevented the 11 AFW pump from running for

the time assumed in their probabilistic risk assessment (PRA) model. Considering the time the bearing was in this condition, the licensee calculated the condition resulted in an increase in core damage frequency (CDF) of $2E-5$ /year.

During a subsequent special inspection, the NRC identified compliance concerns regarding to adherence to maintenance order (MO) instructions that limited sealant application. The NRC determined this (Yellow) performance issue was a violation of NRC requirements and an NOV was issued. Additionally, during the special inspection compliance concerns of very low risk significance (Green) were identified in regard to control of lubricating oil and missing acceptance criteria for critical bearing parameters. The inspectors determined the licensee's evaluations documented and addressed these compliance concerns.

02.02 Root Cause and Extent of Condition Evaluation

- a. Determine that the problems were evaluated using a systematic method to identify the root causes and contributing causes.

The inspectors determined the licensee used systematic methodologies to identify the root and contributing causes of the 11 AFW pump turbine bearing failure. The licensee applied the Kepner-Tregoe analysis methodology to investigate the physical causes of the bearing temperature excursion. The analysis was used to confirm sealant intrusion was the cause and rule out alternative causes.

After a special inspection in July 2001, the licensee re-evaluated the underlying causes that led to the over-application of permatex sealant to the 11 AFW pump turbine bearing housings. The licensee used a "why staircase" analysis to identify and understand the underlying human behavior causal factors involved in the over-application of permatex sealant. Furthermore, considering the risk significance of the AFW system, the licensee used a collective significance analysis methodology to re-assess previous AFW equipment problems and help ensure that recurring problems have been identified and effectively addressed.

- b. Determine that the root cause evaluations were conducted to a level of detail commensurate with the significance of the problem.

The root cause evaluations of the performance issue were of adequate detail to identify the likely physical cause of the AFW bearing failure, namely sealant intrusion into the bearing. The causal evaluations were also of sufficient detail to identify the underlying conditions that led to application of the sealant to the AFW bearing housing in excess of that described in the maintenance order instructions and the vendor technical manual.

As described in their NOV response, the licensee determined the underlying causes involved human performance errors during maintenance, less than adequate understanding by personnel in regard to the risk significance of equipment being serviced, and less than effective causal analyses of some previous equipment problems. The inspectors reviewed the evaluations that supported the NOV response, and determined they provided further detail of these underlying causes.

The licensee's "why staircase" analysis indicated that the maintenance personnel applied sealant in excess of the MO instructions due to a number of underlying conditions. Personnel applied sealant in sufficient quantities to provide a high level of confidence that there would not be oil leaks from the bearing. Additionally, the bearing inspection and reassembly work was performed periodically, and this work was perceived by maintenance personnel and supervision to be a routine activity. Considering the risk involved, work practice expectations in regard to following instructions were not adequately stated or reinforced by supervision for this work.

The licensee also identified inadequate training on sealant and gasket application as a contributing cause, and additionally, less than clear vendor technical manual direction as referenced in the MO instructions. The vendor manual indicated that a "thin film" of sealant should be applied to prevent sealant intrusion into the bearing, but also allowed for a .015" thickness, which, when applied, may extrude out somewhat between the bearing pedestal and bearing cap joint when reassembled. Finally, the licensee identified that the AFW turbine bearing lubrication system uses an oil ring to lubricate the bearing. This configuration does not provide as much design margin as a forced lubrication system, making it more susceptible to problems under adverse conditions such as the presence of foreign material in the lubricating oil.

The licensee's collective significance assessments were conducted to an appropriate level of detail to identify hardware enhancements and additional inspection plans intended to support overall AFW system reliability. The licensee planned to perform an inspection of the bearing housing bores, mounting surfaces and oil reservoirs to ensure they continue to meet factory specifications. Additionally more detailed inspections of the AFW bearing oil ring dimensions were planned. The licensee further planned to install a flexible pump-turbine coupling and modify the AFW vibration monitoring instrumentation to improve monitoring capability.

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

The inspectors determined the licensee's root cause evaluations identified and considered the plant specific performance history of the AFW bearings, and in particular, previous sealant application problems. The licensee also reviewed reported industry AFW bearing problems, and contacted licensees with similar AFW turbine designs to determine whether they experienced similar bearing problems. The licensee also consulted with vendor and industry personnel who had experience with turbine bearing problems both within the nuclear industry and in general industrial applications.

- d. Determine that the root cause evaluations included consideration of potential common causes and extent of condition of the problem.

The inspectors determined that the licensee's root cause evaluations appropriately considered the potential for a common cause failure of the AFW pumps and extent of the problems. As described in the special inspection report, the licensee's immediate corrective actions reflected a consideration of the potential for common cause failure. In addition to repairing the 11 AFW turbine bearing, the licensee inspected the pump turbine bearing housings and sumps of the 12, 21 and 22 AFW pump turbines to

determine whether sealant intrusion had occurred into these turbine bearings. Visual inspections indicated that less sealant had been applied to these bearing housings, and there was not evidence of sealant flow down the sump walls. This was consistent with maintenance personnel recollections that they had applied less sealant to the 12, 21 and 22 AFW turbine bearing housings after being informed by the vendor that too much sealant was being used. The licensee further drained, flushed, and refilled all AFW turbine bearing sumps with new oil to help preclude a common cause failure due to sealant intrusion.

The inspectors determined that the licensee's root cause evaluations appropriately considered, and bounded, the extent of the underlying problems that led to over-application of sealant. The licensee's Nuclear Performance Assessment Department (NPAD) reviewed maintenance performance and issued, in July 2001, an audit finding that described an identifiable trend in maintenance workmanship errors. One workmanship error identified in the audit was the AFW bearing sealant problem. The licensee determined that the workmanship issues were not unique to any single maintenance discipline. In response to the NPAD audit finding, the licensee initiated the Equipment Reliability Improvement Project to improve maintenance workmanship, and consequently, improve system reliability and plant performance. The licensee referenced this initiative in their evaluation report of the AFW bearing failure.

The inspectors reviewed the Equipment Reliability Improvement Project Plan and discussed the plan with responsible personnel. The inspectors determined that, in considering the workmanship issues collectively, the licensee identified some underlying conditions similar to those identified in the root cause evaluation completed specifically for the 11 AFW turbine bearing failure. The licensee indicated that in regard to maintenance work on systems important to safety, the proper balance was not always maintained between supervisory oversight, training, and MO or procedural instruction detail. In some cases there was an over-reliance on "skill of the craft." The licensee also identified there may be some gaps between assumed skill levels of the craft and formal training covering these skills. Additionally, the licensee indicated that the two or more person maintenance teams typically used to perform work did not always appear to have clear roles identified in providing checks to each others work.

02.03 Corrective Actions

- a. Determine that appropriate corrective actions are specified for each root and contributing cause, or that there is an evaluation that no actions are necessary.

The inspectors determined the licensee specified corrective actions for each identified cause. The licensee implemented corrective actions to ensure proper control is maintained when applying sealant to the AFW turbine bearing housings. The licensee revised the MO instructions for bearing reassembly to refer to Procedure TURB-01, "Auxiliary Feedwater Pump Turbine Overhaul," in lieu of previous written MO instructions. This procedure provides detailed guidance on bearing reassembly and checks for critical parameters. The licensee also revised this procedure to reduce the thickness of sealant to be applied to .005 inch and limit the bearing cap sealing surface over which the sealant was to be applied. The vendor technical manual guidance was similarly revised. Additionally, the inspectors determined the licensee was revising Procedure TURB-01 to require that the bearing oil be replaced each time the bearings were disassembled. Furthermore, the inspectors determined the licensee reviewed other mechanical, instrumentation, and electrical maintenance procedures that involve sealant application. Where deemed necessary, the licensee added cautionary statements to apply sealant sparingly to minimize the potential for foreign material intrusion.

The inspectors determined that the licensee had taken corrective action to reinforce standards and expectations of adherence to MO instructions during "tailgate sessions." The inspectors reviewed the attendees list and training material, and determined the material also provided training on the proper use and application sealants. Additionally, the licensee provided training to maintenance and engineering personnel to ensure that personnel understand the role good workmanship plays in preventing risk significant equipment problems.

The inspectors further determined that the licensee identified short and longer term corrective actions, described in the Equipment Reliability Improvement Project Plan, to address underlying conditions that have contributed to maintenance workmanship problems. The licensee revised procedure requirements in MN-1-100, "Conduct of Maintenance," to ensure adequate supervisory oversight was maintained, especially for risk significant work. Corrective actions were further planned to increase supervisory review of MO instructions and procedure guidance for risk significant maintenance work, considering the skills required to perform the task. Additionally, the licensee tracked a corrective action to have maintenance supervision identify, and address as appropriate, skills that are used to accomplish maintenance work where there is minimal instruction, no procedural guidance, and no formal training is provided to teach the task.

The inspectors further noted, that although not the cause of the AFW bearing failure, the licensee addressed examples of weakness in the corrective action process that were identified during the special inspection. The licensee had reinforced procedural expectations for causal evaluations and instituted a root cause evaluation grading sheet to provide feedback to personnel and foster improvement in this area.

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

The inspectors determined that the licensee prioritized corrective actions with consideration of the associated risk and regulatory compliance issues. As described in the special inspection report, the licensee took immediate actions to return the 11 AFW pump to operability, and confirmed the other AFW turbine bearings were not similarly affected. Corrective actions to better control sealant application and reinforce adherence to MO instructions were completed to support ongoing maintenance work. These actions addressed the regulatory compliance issue in regard to adherence to MO instructions on equipment that is important to safety.

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

The inspectors determined that the licensee either completed, or was tracking the corrective actions identified within their cause evaluations. The inspectors noted each corrective action had a database tracking number, responsible individual assigned, and an identified due date.

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

The inspectors determined that the licensee developed and tracked tasks to perform appropriate effectiveness reviews after corrective actions were completed. The licensee planned to inspect AFW pump turbine bearing housings during the next two normally scheduled bearing inspections to verify sealant has not extruded over the bearing casing walls. Additionally, the licensee was monitoring maintenance work for equipment problems due to over-application of sealant. The licensee's Equipment Reliability Improvement Project Plan proposed quantitative measures of maintenance effectiveness in terms of the equipment unavailability due to workmanship issues and maintenance rework trend. The plan also included discrete effectiveness review milestones.

02.04 Independent Assessment of Extent of Condition and Generic Implications

The licensee's extent of condition review determined that, in addition to the AFW performance issue, there was a trend in maintenance workmanship issues with underlying causes due to inadequate reinforcement of instruction adherence and maintaining the proper balance between instruction detail and use of skill of the craft capabilities. Consequently, the licensee was implementing broader corrective actions to address these conditions as described in their Equipment Reliability Improvement Project.

The inspectors independently assessed the extent of the underlying conditions that led to the AFW performance issue, to determine whether the licensee's evaluations had appropriately bounded the problem. The independent assessment was accomplished by reviewing a sample of completed MOs, corrective action program issue reports (IRs), and maintenance activities in the field. The inspectors selected completed MOs and

IRs on risk significance equipment that involved work activities similar to those tasks in progress when sealant was over-applied to the 11 AFW bearing. These documents were reviewed with particular emphasis on adherence to instructions, instruction guidance detail, and control of foreign material.

In reviewing the sample of completed MO's, IRs and maintenance activities during the inspection, the inspectors did not identify findings of safety significance. However, with regard to the completed MO's, the inspectors did identify a minor instance of inadequate adherence to work instructions in regard to preventive maintenance on a saltwater pump, and two instances where work instructions included minimal detail, resulting in increased reliance on skill of the craft for critical aspects of the work. The inspectors determined these issues were similar to those the licensee identified in their extent of condition review, and would be addressed within the scope of the licensee's corrective actions, when fully implemented. As a result, the inspectors concluded the licensee's extent of condition review appropriately bounded the underlying conditions that led to the AFW performance issue, and supported the need for the broader corrective actions described in the licensee's Equipment Reliability Improvement Project.

The inspectors identified a minor example of inadequate adherence to work instructions when MO#1200004720 was performed in June 2001. This MO provided instructions to periodically remove excess grease from the #13 saltwater pump thrust and radial bearings. The instructions for the radial bearing allowed maintenance personnel to mark these steps as not applicable if they concluded that corrosion on the bolts and bearing cover could interfere with proper bolting removal and reinstallation. A note in the MO indicated that if the grease was not removed from both bearings, a corrective action program issue report (IR) should be initiated and the responsible system engineer notified. The inspectors determined that maintenance personnel marked the steps for the radial bearing as not applicable, but did not initiate an IR or indicate that the responsible system engineer was informed.

During the inspection, the licensee initiated IR3-076-998 and IR3-076-999 to address this problem, and they further identified thirteen similar occurrences in other completed saltwater pump maintenance orders. The inspectors determined that intermittent removal of excess grease from the radial bearings did not impact the performance of these bearings since routine online monitoring of bearing temperatures and pump vibration results did not indicate abnormal conditions, and there had been no reported failures of the bolting in the last twenty years. Additionally, the bearings of the normally running saltwater pumps have been replaced within the last five years as part of normal periodic pump overhauls.

The inspectors identified two MO's completed on safety related equipment, where the instruction detail was minimal, such that critical aspects of the task were not addressed and consequently left to the skill of the craft. The inspectors determined that a MO to repair an oil leak from a threaded plug in the 21 low pressure safety injection pump bearing sump directed maintenance personnel to drain the oil, apply a sealant to the drain plug threads, and refill the sump. Although maintenance personnel documented in the MO that they limited sealant application to the first few plug threads due to foreign material intrusion concerns, the MO instructions did not provide this caution. The inspectors similarly identified that a MO to repack grease in the 12 high pressure safety

injection pump coupling did not require maintenance personnel to document, or independently verify as correct, the torque they selected from a vendor manual and applied to the coupling bolts.

4OA6 Management Meetings

The inspectors presented the inspection results to members of licensee management, at the conclusion of the inspection on December 13, 2001. No proprietary information was identified during the inspection.

Attachment: Supplemental Information

Attachment

KEY POINTS OF CONTACT

Calvert Cliffs

C. Cruse, Vice President
P. Katz, Plant General Manager
M. Geckle, Director, Nuclear Regulatory Matters
M. Navin, Superintendent, Technical Support
C. Sly, Nuclear Regulatory Matters
S. Metcalf, Maintenance
R. Bowie, Mechanical Maintenance Support Unit
M. Gehan, Issues Assessment Unit

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

CLOSED

50-317 EA-01-206 NOV Failure to complete reassembly of 11 AFW pump turbine outboard bearing in accordance with maintenance order instructions.

LIST OF ACRONYMS

AFW	Auxiliary Feedwater
CDF	Core Damage Frequency
LER	Licensee Event Report
MO	Maintenance Order
NOV	Notice of Violation
NPAD	Nuclear Performance Assessment Department
NRC	Nuclear Regulatory Commission
PRA	Probabilistic Risk Assessment

Attachment (cont.)

LIST OF DOCUMENTS REVIEWED

PROCEDURES

Fastener-01	Torquing and Fastener Applications, Revision 1
Lube-02	General Lubrication Procedure, Revision 4
MN-1-102	Preventive Maintenance Program, Revision 8
MN-1-100	Conduct of Maintenance, Revision 20
CH-1-100	Controlled Materials Management, Revision 7
QL-2-100	Issue Reporting and Assessment, Revision 15
QL-2-101	Casual Analysis, Revision 4
Turb-01	Auxiliary Feedwater Pump Turbine Overhaul, Revision 7

MAINTENANCE ORDERS

0200001330	1199602765	1200100049	1200003322	1200103119	2200101441	2200102355
0200100262	1199802146	1200100887	1200102281	2199904491	2200101468	220010477
0200100976	1200004720	1200100373	1200102355	2200002539	2200101717	

ISSUE REPORTS

IR3-075-191	IR3-076-998	IR3-076-999	IR3-026-278	IR3-030-674	IR3-044-163
IR3-045-491	IR3-050-956	IR3-050-955	IR3-054-329	IR3-054-465	IR3-082-887
IR3-045-656	IR3-020-554	IR3-041-447	IR3-041-444		

(including
AF200100003
and
PD200100008)

OTHER DOCUMENTS

Calvert Cliffs Casual Analysis Handbook, Revision 0
CCNPP Unit 1, Computer Point Displays
CCNPP Station PI Notebook Computer Display Screens
Conduct of Maintenance and Reliability Improvement Project Plan, Rev. 1, dated 10/24/01
RPA-2001-1568, Request for Procedure Activity to TURB-01, dated 10/22/01
Vendor Technical Manual 12083-010, "Steam Generator, Auxiliary Feed Pump", Rev. 45
Reptask 10362000 and 10362035, printed December 11, 2001
Calvert Cliffs letter dated October 18, 2001, responding to NOV