

December 29, 2006

Mr. Paul A. Harden
Site Vice President
Nuclear Management Company, LLC
Palisades Nuclear Plant
27780 Blue Star Memorial Highway
Covert, MI 49043-9530

SUBJECT: PALISADES NUCLEAR PLANT
NRC SPECIAL INSPECTION REPORT 05000255/2006014(DRS)

Dear Mr. Harden:

On November 17, 2006, the U.S. Nuclear Regulatory Commission (NRC) completed a special inspection at your Palisades Nuclear Power Plant. The enclosed inspection report documents the inspection findings, which were discussed at the exit meetings on November 17 and December 21, 2006, with you and members of your staff.

On November 3, 2006, during a reactor startup, an NRC inspector noted that the Auxiliary Feedwater (AFW) Pump control switches for all three pumps were in manual rather than automatic. The inspector brought this condition to the attention of the plant operating staff. After verifying that the AFW control switches should have been in automatic for current plant conditions, the switches were placed in the correct position. The AFW control switches are required to be in automatic for the AFW System to be considered operable. In order to fulfill its designed safety function, Technical Specifications require that AFW be operable prior to and during plant startup and operation. The licensee's initial investigation identified that during a reactor shutdown on November 1, 2006, a Reactor Operator had incorrectly positioned the AFW control switches. Over the next two days, subsequent operating crews failed to identify and correct the error.

Following criterion h of Management Directive 8.3 (questions or concerns pertaining to licensee operational performance) and Inspection Procedure 71153, a Special Inspection was initiated in accordance with Inspection Procedure 93812. The Special Inspection officially commenced on November 6, 2006.

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.

The enclosed report documents three NRC-identified findings of very low safety significance (Green). These findings were determined to involve violations of NRC requirements. However, because of the very low safety significance and because they are entered into your corrective action program, the NRC is treating these three findings as Non-Cited Violations (NCVs), in accordance with Section VI.A.1 of the NRC Enforcement Policy. If you contest any NCV, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator - Region III, 2443 Warrenville Road, Suite 210, Lisle, IL 60532-4352; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at the Palisades 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 System (PARS) component of NRC's document system (ADAMS), accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

/RA by A.T. Boland Acting For/

Cynthia D. Pederson, Director
Division of Reactor Safety

Docket No. 50-255
License No. DPR-20

Enclosure: Inspection Report 05000255/2006014
w/Attachments: 1. Supplemental Information
2. Special Inspection Team Charter
3. Timeline

cc w/encl: R. Fenech, Senior Vice President, Nuclear
Fossil and Hydro Operations
D. Cooper, Senior Vice President - Group Operations
L. Lahti, Manager, Regulatory Affairs
J. Rogoff, Vice President, Counsel and Secretary
A. Udrys, Esquire, Consumers Energy Company
S. Wawro, Director of Nuclear Assets, Consumers Energy Company
Supervisor, Covert Township
Office of the Governor
State Liaison Office, State of Michigan
L. Brandon, Michigan Department of Environmental Quality -
Waste and Hazardous Materials Division

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U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket No: 50-255
License No: DPR-20

Report No: 05000255/2006014

Licensee: Nuclear Management Company, LLC

Facility: Palisades Nuclear Power Plant

Location: Covert, MI

Dates: November 6 through 17, 2006

Inspectors: Bruce Palagi, Senior Reactor Operations Inspector
Team Leader
Alex Garmoe, Reactor Engineer
John Giessner, Resident Inspector, Palisades
Charles Zoia, Reactor Operations Inspector

Approved By: Hironori Peterson, Chief
Operations Branch
Division of Reactor Safety

SUMMARY OF FINDINGS

IR 05000255/2006014; 11/6/06 - 11/17/06; Palisades Nuclear Power Plant; Special Inspection for the Auxiliary Feedwater System control switch misalignment during the reactor shutdown and startup on November 1 and 3, 2006.

This report covers an on-site and in-office Special Inspection conducted by four Region III inspectors. The inspection identified three Green findings and associated Non-Cited Violations. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter 0609, "Significance Determination Process." Findings for which the Significance Determination Process 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."

A. Inspector-Identified and Self-Revealed Findings

Cornerstone: Mitigating Systems

- Green. The inspectors identified a finding of very low safety significance associated with a Non-Cited Violation (NCV) of Technical Specification 5.4.1a for an operator failing to comply with the site quality procedure for Conduct of Operations by manipulating safety related components without any procedure guidance. The operator placed all Auxiliary Feedwater (AFW) pumps out of automatic control, causing the pumps to be inoperable and placing the plant outside of the licensing basis. Corrective actions to address this finding included removing the operator who made the error from shift and briefing each operating crew on this event.

This finding was of more than minor safety significance because the operator did not follow procedural guidance which resulted in the inoperability of all three AFW pumps. This finding is of very low significance because the evaluation of increased risk associated with this error concluded that the total change in core damage frequency (Δ CDF) considering internal events, external events, and large early release frequency (LERF) was less than 1×10^{-6} . This finding had a cross-cutting aspect in the area of Human Performance, because the licensee did not use human error techniques, such as self or peer checking, or proper documentation of activities for placing the AFW switches to manual. (Section 4OA3.3b)

- Green. The inspectors identified a finding of very low safety significance associated with a Non-Cited Violation of Technical Specification 3.7.5 for the licensee's failure to comply with the required action time to be in Mode 4 in 30 hours with no AFW pumps operable. In addition, the inspectors identified the failure to comply with the action of TS 3.0.4 in that the licensee ascended from Mode 3 to Mode 2 with no AFW pumps operable. The licensee's failure to detect and correct, using appropriate board walk-downs and turnover techniques, that all three AFW pumps were in manual directly caused the violation of Technical Specifications. Corrective actions to address this finding included requiring the use of a checklist to verify correct control room switch alignment, and increasing management oversight of the control room.

This finding was of more than minor safety significance because numerous operators failed to identify that all three AFW pumps were inoperable. This finding is of very low significance because the evaluation of increased risk associated with this error concluded that the total Δ CDF considering internal events, external events, and LERF was less than 1×10^{-6} . This finding had a cross-cutting aspect in the area of Human Performance because the licensee did not effectively communicate expectations regarding procedural compliance. Specifically, personnel who had the knowledge of the issue failed to evaluate the condition in accordance with procedure guidance and failed to ensure that the proper procedure for tracking and resolving safety related equipment issues were followed. (Section 40A3.4b)

- Green. The inspectors identified a finding of very low safety significance associated with a Non-Cited Violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," for the licensee's failure to provide adequate procedures, appropriate for the circumstances of plant startup and shutdown. Specifically, procedures were not adequate to place the AFW system in service for a plant shutdown. In addition, inadequate procedural guidance existed for safety system alignment checks prior to reactor startup from Mode 3. Corrective actions to address this finding included initiating a root cause analysis and actions to upgrade start-up and shutdown procedures.

This finding was of more than minor safety significance because the inadequate procedural guidance resulted in operators not placing or maintaining the AFW system in an operable condition. This finding is of very low significance because the evaluation of increased risk associated with this error concluded that the total Δ CDF considering internal events, external events, and LERF was less than 1×10^{-6} . This finding had a cross-cutting aspect in the area of Human Performance because the licensee did not plan or coordinate shutdown activities relating to AFW operation. The licensee inappropriately relied on pre-job briefings as a compensatory action in lieu of written instructions. (Section 40A3.5b)

REPORT DETAILS

Summary of Plant Event

On Wednesday, November 1, 2006, a reactor shutdown was initiated due to a service water leak on a containment air cooler. The control room staffing for the shutdown consisted of three Senior Licensed Reactor Operators (SRO): (1) a Shift Manager (SM); (2) a Shift Engineer/Shift Technical Advisor (SE); and (3) a Control Room Supervisor (CRS). Three Licensed Reactor Operators (RO) were also onshift: (1) one at the controls (ATC) of the reactor; (2) one to operate balance of plant (BOP) equipment; and (3) an extra operator dedicated to the feedwater system control. At 9:48 pm, as part of the planned shutdown, the extra operator started Auxiliary Feedwater (AFW) pumps P-8A and P-8C, and tripped the last running Main Feedwater pump. By 9:52 pm, the extra operator had determined that only one AFW pump was needed for decay heat removal. The extra operator, with the permission of the CRS, secured the 8A AFW pump, placed the AFW flow controllers in manual, and reduced flow to both steam generators. After the 8A AFW pump was secured, the extra operator at the direction of the CRS, turned over feedwater control to the ATC operator. Shortly after the ATC operator took over feedwater control, the operator returned the AFW flow controllers to automatic at a reduced set point to maintain the current flow, placed the control switches for the two motor driven AFW pumps in manual position, and placed the control switch for the steam supply valve to the steam driven AFW pump in the closed position. Placing the motor driven AFW pumps in the manual position and placing the steam valve in the closed position made all three AFW pumps unavailable for automatic start. This was a violation of Technical Specifications that required automatic operation of AFW be available in Modes 1, 2, and 3. The ATC operator took this action without procedural guidance, without the permission or knowledge of the CRS, without the required peer check, and without logging his actions.

The reactor was maintained in Mode 3 for the next 2 days while the service water leak on the containment air cooler was repaired. During those 2 days, 6 shift changes occurred that required control room panel walk-downs. The operators performing those walk downs failed to recognize that the AFW system was misaligned, or in a few cases, recognized the unusual alignment but failed to pursue the reason it existed. At 5:46 pm on November 3, 2006, with a startup in progress, the plant entered Mode 2. At approximately 6:30 pm, an NRC inspector performing an observation of the plant startup questioned the position of AFW mode switches. After a review by the SM and CRS, it was determined that the AFW lineup was in error and contrary to Technical Specifications. The AFW system was then returned to the correct alignment at 6:34 pm.

4. OTHER ACTIVITIES (OA)

4OA3 Special Inspection (93812) (Charter Attached as Attachment 2)

.1 Time-line of Events - (Charter Item 1)

a. Inspection Scope

The inspectors reviewed control room logs, plant computer sequence of event recordings, plant parameter recordings, and conducted interviews to determine the relevant sequence of events from 3:30 pm on November 1, 2006 through 5:00 pm on November 6, 2006. The sequence of events was compared with Technical Specifications 3.7.5, 3.0.4, and 5.4.1a, and 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," to determine if these requirements were met.

b. Findings and Observations

A timeline of the event is included in Attachment 3. Findings associated with this event are discussed below.

.2 Determine Status of Control Room Personnel - (Charter Item 2)

a. Inspection Scope

The inspectors interviewed operators present in the control room during the event to confirm that staffing was in accordance with Technical Specification manning requirements and station administrative requirements. The inspectors reviewed operator logs and the experience of the operating crew. The inspectors reviewed work hour status records of the licensed operators involved in the event to establish compliance with fitness-for-duty requirements of 10 CFR 26.

b. Findings and Observations

The control room staffing for the shutdown on November 1, 2006, consisted of three SROs and three ROs. No additional oversight of the control room by senior managers or quality assurance personnel was performed during the reactor shutdown. The on-shift control room crew had a mix of experienced and recently licensed operators. The RO who made the operational error of placing the AFW pumps in manual had 9 years of licensed control room operator experience.

During the November 3, 2006, startup, the assistant operations manager provided additional oversight.

The inspectors noted that one individual, the RO who made the operational error, had exceeded the licensee's allowed work-hour limits by approximately 3 hours. The operator had worked 12 hours during the previous work day and reported for an operator licensing physical examination 3 hours prior to working another 12 hours the day of the event. Therefore, the operator worked 27 hours within a 48-hour period,

exceeding the guidance of working no more than 24 hours in a 48-hour period. During an interview, the operator stated that fatigue may have contributed to the error but was not the direct cause of the error. Because the operator's error occurred prior to exceeding the work-hour guidance, this failure to comply with Administrative Procedure 1.00, "Plant Organization and Responsibilities," constituted a violation of minor significance that is not subject to enforcement action in accordance with Section IV of the NRC's enforcement policy. The inspectors noted that the licensee also identified this work-limit violation and entered it into the corrective action program (AR01060412).

The inspectors concluded that the job experience and qualifications of the crew were adequate to perform their respective duties to execute and oversee the plant shutdown operations. With the exception of the RO that made the operational error, overall work hours were not excessive and the operating crew was considered fit-for-duty during the event.

.3 Review Procedures to Determine Required System Lineup - (Charter Item 3)

a. Inspection Scope

The inspectors interviewed the licensed operators involved in the event. The inspectors also reviewed control room operator logs and licensee corrective action program documents to identify licensee procedures used during the event.

The inspectors identified that the following procedures were used in the November 1, 2006, shutdown and subsequent November 3, 2006, startup:

Station Operating Procedures:

GOP-8, "Power Reduction and Plant Shutdown to Mode 2," Revision 22
GOP-3, "Mode 3 > or = 525F to Mode 2," Revision 20
GOP-4, "Mode 2 to Mode 1," Revision 17
SOP-12, "Feedwater System," Revision 47

Fleet Procedure, FP-G-DOC-03, "Procedure Use and Adherence," Revision 1
Administrative Procedure 4.14, "Conduct of Operations," Revision 8
Fleet Procedure, FP-OP-COO-01, "Conduct of Operations," Revision 2
Administrative Procedure 4.02, "Control of Equipment," Revision 35

b. Findings and Observations

Failure to Follow Procedures

Introduction: The inspectors identified a finding with very low safety significance (Green) and associated Non-Cited Violation (NCV) of TS 5.4.1a for an operator failing to comply with the site quality procedure for Conduct of Operations by manipulating safety related components without any procedural guidance. The operator placed all AFW pumps out of automatic control, causing the pumps to be inoperable and placing the plant outside of the licensing basis, without complying with the procedure requirements

to ensure operation within the design function, to obtain supervisor approval, and to log the manipulation in the appropriate logs.

Description: During a Technical Specification required plant shutdown on November 1, 2006, for an unrelated issue with a containment air cooler, the licensee implemented a controlled shutdown in accordance with GOP-8, "Power Reduction and Plant Shutdown to Mode 2." The shutdown progressed to a low power level followed by a turbine trip, startup of the AFW system, and planned reactor trip.

Approximately five to ten minutes after the reactor trip (while in Mode 3), an extra RO performing AFW operations turned over the AFW controls to the primary RO so the extra operator could attend to other shutdown items. The primary RO was concerned that the steam generator (SG) levels could approach automatic actuation setpoints, so he placed all auxiliary feedwater actuation signal (AFAS) control switches to manual from automatic. This rendered all the AFW pumps incapable of starting on a low steam generator signal and rendered the pumps inoperable. There was no guidance in the GOP or in any normal operation procedure to perform this action. Administrative Procedure 4.14, Attachment 7, provides guidance on equipment manipulation and status control. This procedure requires plant equipment to normally be controlled by approved plant procedures. If equipment is operated without an approved procedure or a controlling document, several additional requirements are specified. The items include ensuring the operation is: (1) within the design function; (2) approved by the CRS; (3) noted in the Limiting Condition for Operation log; (4) tracked as off normal; and (5) logged in the Control Room log. None of these requirements were completed on November 1, 2006, and the operator placed the plant outside of the current licensing basis.

The inspectors identified that all AFW pumps were inoperable during a control board review on November 3, 2006. The licensee issued AR01059768, and the control switches were placed in their correct position for Modes 1-3. The licensee removed the individual from watch standing duties and took appropriate follow-up action. No other component mis-positions were identified following an immediate investigation by the licensee.

Analysis: The inspectors determined that the failure to comply with the Conduct of Operations Procedure was a performance deficiency and a finding. This finding was more than minor because the finding was associated with the Mitigating System Cornerstone attribute of Configuration Control and affected the cornerstone objective of ensuring the availability, reliability, and capability of the AFW system. Specifically, the operator did not follow procedural guidance which resulted in the inoperability of all three AFW pumps.

The inspectors completed a significance determination of this finding using Inspection Manual Chapter (IMC) 0609, Appendix A, "Determining the Significance of Reactor Inspection Findings for At - Power Situations." The inspectors answered "yes" to screening Question 2 in the SDP Phase 1 Screening Worksheet under the Mitigation Systems Cornerstone column. Specifically, this finding resulted in the AFW system being incapable of performing its function and being inoperable beyond the Limiting Condition for Operation (LCO). Thus, a Phase 2 evaluation was required.

Phase 2 Assessment

Using IMC 0609 and the Palisades Site Specific SDP Inspection Notebook, Revision 2, dated September 30, 2005, the inspectors performed the Phase 2 analysis. The exposure duration was less than three days. The inspectors solved all of the notebook worksheets except for transients and medium, large, and inter-system loss of coolant accidents. These worksheets were not solved since the reactor was already shutdown when the performance deficiency existed or the sequences were otherwise unaffected by the finding.

In solving the worksheets, the inspectors accounted for motor-driven AFW Pump P-8C running and providing secondary side cooling when the control switches were found in manual. Also, a recovery credit of "1" was applied since the guidance in IMC 0609, Appendix A, Attachment 1, Step 2.3 was met in that operators were trained and had procedures and ample time to restart the stopped AFW pumps. For instance, Step 8 of the post-trip Emergency Operating Procedure, EOP 1.0, directs operators to check AFW flow.

Using the SDP counting rule, two of the sequences had values of "7." The dominant core damage sequences were loss of offsite power followed by failure of AFW and failure of either primary heat removal or containment heat removal. The Phase 2 SDP results therefore represented an increase in risk of approximately 6×10^{-7} (Green).

Phase 3 Assessment - External Events

In accordance with IMC 0609, Attachment 1, Step 2.5, the Phase 2 SDP result of greater than or equal to 1×10^{-7} necessitated performance of a Phase 3 analysis by a Senior Reactor Analyst (SRA) to estimate the increase in risk due to external initiators. The discussion below is based on the SRA's review of the licensee's June 1995 Individual Plant Examination of External Events (IPEEE) report, its January 1993 Individual Plant Examination for Severe Accident Vulnerability (IPE) report, Alternate Safe Shutdown Procedure ONP-25.2, and the licensee's own analysis of this event documented in its "AFW HS in Manual CCDP Evaluation."

For control room fires, the licensee performed a risk-informed analysis based on operator actions in its Alternate Safe Shutdown Procedure. The licensee assumed that its human error model for internal events was also applicable to fires. The human error probability used in its internal events model for start of the AFW pumps given a failure to start automatically on an AFAS was 3.38×10^{-2} . Assuming a fire in the control room, the operator would take as many immediate actions as possible before evacuating, as directed by Procedure ONP-25.2, Step 5.2 (Immediate Actions). It is expected the operator would take manual control of turbine-driven AFW pump P-8B within a few minutes of the onset of the event from the control room or several minutes after evacuation to the alternate shutdown panel. The AFW flow to the steam generators is not required until the plant trips or is manually tripped by the operators and main feedwater is unavailable.

If a plant trip is required, it will likely be initiated by the operators. For these events it is more likely that the operators will be aware of the status of heat removal and have initiated actions necessary to maintain heat removal via the steam generators. Heat

removal via main feedwater or condensate will remain available in some cases. Both are assumed unavailable in the fire risk assessment. The licensee's analysis showed a number of success paths for restarting the AFW system in the event of control room evacuation.

For fires in areas outside the control room and for fires in the control room which do not require evacuation, one or both motor-driven pumps may also be available. Based on a review of the IPEEE report, a significant percentage of the reported core damage frequency from fires would be either unchanged or only slightly changed given the alignment of the AFW pumps to manual. Based on the above information and the exposure period of approximately 45 hours for this finding, the SRA concluded that risk due to fire would not be significant.

For seismic events, the IPEEE showed that loss of secondary heat removal with failure of once-through cooling during the injection and recirculation phases dominated the seismic-induced CDF. There were no seismic failures in the IPEEE that identified an impact on equipment required for once-through cooling.

For flooding events, the total core damage frequency was dominated by flooding from internal sources and was estimated to be 3×10^{-7} /year. For the exposure period of approximately 45 hours for this finding, the SRA concluded that risk due to flooding would be less than that of the internal events risk.

For other events there were no vulnerabilities identified in the IPEEE.

The SRA concluded that external event risk did not significantly contribute to the overall risk associated with this finding.

Phase 3 Assessment - Large Early Release Frequency (LERF) - Using IMC 0609, Appendix H, "Containment Integrity Significance Determination Process," the SRA determined that this was a Type "A" finding (i.e., LERF contributor) for a large dry containment. For PWR plants with large dry containments, only findings related to accident categories inter-system loss of coolant accident (ISLOCA) and steam generator tube rupture (SGTR) have the potential to impact LERF. Because this finding was not related to ISLOCA or SGTR, nor did any of the core damage sequences from the Phase 2 analysis have the potential to affect LERF, the SRA concluded that LERF was not a significant contributor to the risk associated with this finding.

Licensee's Analysis: The licensee performed a calculation using its SAPHIRE software to determine the risk significance of the AFW pumps selection switch being in the manual position for the estimated duration. Two major assumptions were: 1) 30-minute duration to start the AFW pumps given failure to start automatically; and 2) failure of the AFAS signal to automatically start AFW Pump P-8C for all initiating events. The first assumption was conservative since the licensee's analysis showed that operators would have about 2.5 hours to align once-through-cooling assuming failure of the turbine-driven AFW Pump (P-8B). The second assumption was conservative since AFW Pump P-8C was already running so only a loss of offsite power initiating event would result in the failure of the AFAS signal to automatically start P-8C.

The licensee's estimated Δ CDF was determined to be 2.5×10^{-7} .

Significance Determination Conclusion: The SRA concluded that the total Δ CDF considering internal events, external events, and LERF was less than 1×10^{-6} (Green).

The inspectors also identified that this finding had a cross-cutting aspect in the area of Human Performance because the operator did not use human error techniques such as self or peer checking or proper documentation of activities for placing the AFW switches to manual.

Enforcement: TS 5.4.1a requires, in part, that procedures be implemented covering activities from the applicable procedures in Regulatory Guide 1.33, Revision 2, Appendix A. Appendix A, as part of administrative procedure section 1.c, requires procedures for equipment control. Site Administrative Procedure 4.14, "Conduct of Operations," implements, in part, equipment and status control in Attachment 7. Contrary to Attachment 7, on November 1, 2006, an operator operated the AFW system without procedural guidance and without complying with the items required in the attachment to evaluate and control the evolution. However, because this violation was of very low safety significance and because the issue was entered into the licensee's corrective action program (AR01059768) this violation is being treated as an NCV, consistent with Section VI.A.1 of the NRC Enforcement Policy (NCV 05000255/2006014-01). The licensee's initial immediate corrective action included removing the operator from duties and briefing all operations personnel during an operations stand down.

.4 Interview Operators Regarding Their Performance - (Charter Item 4)

a. Inspection Scope

The inspectors interviewed the licensed operators involved in the event, each of the operators that were aware that the AFW pumps were in manual between November 1 and November 3, 2006, and a few operators who performed shift turnovers during the period in question and did not identify the AFW switches out of the correct position. The inspectors also reviewed control room operator logs over this same period.

b. Findings and Observations

Failure to Comply with Technical Specifications

Introduction: The inspectors identified a finding of very low safety significance (Green) and a NCV of TS 3.7.5 for the licensee's failure to comply with the required action time to be in Mode 4 in 30 hours with no AFW pumps operable and TS 3.0.4 in that the licensee ascended from Mode 3 to Mode 2 with no AFW pumps operable. The licensee's failure to detect, using appropriate board walkdowns and turnover techniques, that all three AFW pumps were in manual directly caused the violation of Technical Specifications.

Description: At approximately 6:30 pm on November 3, 2006, during reactor startup, after the plant had administratively declared Mode 2, but before the reactor was critical,

an NRC resident inspector noted all three of the AFW pumps were in manual. The inspector questioned the assistant operations manager overseeing the start-up if having all AFW pumps in manual was an acceptable lineup to take the reactor critical. After review by the SM and CRS, the licensee determined that the lineup was not acceptable and contrary to Technical Specifications. The licensee immediately restored the operability of the system. The inspector reviewed other safety systems and found them to be in their correct alignment. The licensee evaluated the current plant status and determined that the startup could be continued.

The licensee determined that the switches had been in the manual position since approximately 9:52 pm on November 1, 2006. The inspectors independently reached the same conclusion based on independent information collected and the interviews conducted. It was determined that the plant was in Mode 3 for approximately 45 hours with all three pumps inoperable, which exceeded the TS 3.7.5b action to be in Mode 4 within 30 hours. An additional TS violation occurred on November 3, 2006, when the plant also transitioned from Mode 3 to 2. This is prohibited by TS 3.0.4.

During an interview, the operator who placed the AFW pumps in manual stated that, based on his understanding of AFW operation, he should not have placed the pumps in manual. He had no explanation for not obtaining supervisor approval or logging his actions. He explained that during simulator training scenarios, he had often been in situations in which AFW had automatically started and as expected, he would place the pumps in manual control. He stated that he may have confused the off-normal simulator training with the normal shutdown conditions that existed at the time he made the error. His failure to follow site procedures is the subject of the NCV discussed in Section 4OA3.3b.

The inspectors reviewed the operator logs and interviewed several operators who either were on watch or took the watch during the 45 hours in question. Seven operating shifts were either on shift at the time or had assumed the watch and had not detected or taken action on the mispositioning. About 40 control board walk-downs should have been completed and a total of 23 different people were on watch in the control room as licensed operators or shift engineers while the switches were incorrectly positioned. Four people, other than the individual who mispositioned the switches, knew the switches were in manual. These individuals reasoned that there must have been some procedure which controlled the switch position or did not make the connection between switch position and operability. There was no log (LCO log, control room log, or out of position log) which recorded this position. Control room watchstanders are required to walk down the main control room boards as part of watchstander turnover in accordance with Fleet Procedure FP-OP-COO-01, "Conduct of Operations," Attachment 14. The inspectors concluded the walk-downs were not adequate to detect the AFW switches being out of position or to ensure that the switches were in the appropriate tracking system or logged as required by plant procedure, Administrative Procedure 4.02, "Equipment Tracking."

Analysis: The inspectors determined that the failure to identify the AFW pump switches were not in the correct position was a performance deficiency and a finding. This finding was more than minor because the finding was associated with the Mitigating System Cornerstone attribute of Human Performance and affected the cornerstone objective of

ensuring the availability, reliability, and capability of the AFW system. Specifically, numerous operators failed to identify that all three AFW pumps were inoperable.

The inspectors completed a significance determination of this finding using IMC 0609, Appendix A, "Determining the Significance of Reactor Inspection Findings for At - Power Situations," dated November 22, 2005. The inspectors answered "yes" to screening Question 2 in the SDP Phase 1 Screening Worksheet under the Mitigation Systems Cornerstone column. Specifically, this finding resulted in the AFW system being incapable of performing its function and being inoperable beyond the limiting condition for operation. Thus a Phase 2 evaluation was required. The inspectors determined that the risk evaluation for this finding was similar to NCV 05000255/2006014-01 which concluded that the total Δ CDF considering internal events, external events, and LERF was less than 1×10^{-6} . Therefore, the failure to identify the AFW pump switches were not in the correct position was also determined to be of very low safety significance (Green) by evaluation through the Phase 2 and Phase 3 processes.

This finding had a cross-cutting aspect in the area of Human Performance because the licensee did not effectively communicate expectations regarding procedural compliance. Specifically, personnel who had the knowledge of the issue failed to evaluate the condition in accordance with procedure guidance and failed to ensure that the proper procedure for tracking and resolving safety related equipment issues were followed.

Enforcement: Technical Specification 3.7.5 requires that while the plant is in Modes 1, 2, and 3 two AFW trains must be operable. The TS action statement B requires that with "less than two AFW pumps Operable in Mode 1, 2 or 3 be in Mode 4 in 30 hours." In addition TS 3.0.4 requires, in Part a, that when a limiting condition of operation is not met, entry into a mode or specified condition of applicability shall only be made when the actions to be entered permit continued operation in the mode or other specified condition in the applicability for an unlimited period of time. The TS Action for three AFW pumps inoperable is not permitted for an unlimited period of time, but for 30 hours.

Contrary to the above, between November 1, 2006, at 9:52 pm to November 3, 2006, 6:35 pm, the licensee had all three AFW pumps inoperable for over 45 hours and action was not taken to be in Mode 4. In addition, the licensee transitioned from Mode 3 to Mode 2 at 5:46 pm on November 3, 2006, with three AFW pumps inoperable.

However, because this violation was of very low safety significance and because the issue was entered into the licensee's corrective action program (AR01059768) this violation is being treated as an NCV, consistent with Section VI.A.1 of the NRC Enforcement Policy (NCV 05000255/2006014-02). The licensee initiated a detailed checklist to review safety systems on a periodic basis as part of shift activities. Operations management reinforced their expectations and put senior manager oversight in the control room on a 24-hour, 7-day per week rotation for some period of time.

5. Determine Adequacy of Shutdown and Startup Procedures and Training - (Charter Item 5)

a. Inspection Scope

The inspectors reviewed the procedures and training materials relevant to the November 1, 2006, shutdown and November 3, 2006, startup.

b. Findings and Observations

Training on plant startup, shutdown, and the AFW system has been performed as part of initial and requalification training. The training was found to be consistent with the requirements of the station System Approach to Training Program. No findings related to training were identified.

A finding of very low safety significance was identified in the area of procedure adequacy.

Failure to Provide Adequate Procedures

Introduction: The inspectors identified a finding of very low safety significance (Green) and an associated NCV of 10 CFR Part 50, Appendix B, Criterion V for the licensee's failure to provide adequate procedures, appropriate for the circumstances of plant startup and shutdown. Specifically, procedures were not adequate to place the AFW in service for a plant shutdown. In addition, procedural guidance for safety system alignment checks prior to reactor startup from Mode 3 was inadequate.

Description: The inspectors noted that Shutdown Procedure, GOP-8, "Power Reduction and Plant Shutdown to Mode 2" was the governing procedure for a plant shutdown. The inspectors identified that the procedure did not contain a specific step to place the AFW system in service. As was pre-briefed on November 1, 2006, operators would place the AFW system in service prior to a manual reactor trip to better control steam generator levels. Step 3.3 in Section 3.0 required the operator to ensure AFW is available and stop the Main Feed Pump. However, the step did not direct the operator to actually start the AFW system. The step referenced SOP-12, "Feedwater System," which contained general guidance for starting a pump, but no guidance on shifting controller modes of operation from cascade or automatic to manual. The inspectors also noted that SOP-12 did not include a precaution regarding AFW inoperability if the controller was placed in manual. The inspectors concluded there was no integrated guidance on how to place the AFW system in service at lower power levels with the main feedwater system in operation and no guidance on controlling steam generator levels while transitioning from main to auxiliary feedwater.

The inspectors also noted that start-up procedure, GOP-3, "Mode 3 > or = 525F to Mode 2" included General Check List (GCL)-3 which contained some checks for AFW alignment prior to criticality. Prerequisite 1.1 of GCL-3 required operators to ensure GCL-2 had been completed. Step 4.12.e required operators to verify the AFW pumps, P-8A and P-8C, were operable and the actuation signal was reset. The step also refers to SOP-12, Attachment 2 which verifies the AFAS is in automatic. The inspectors also noted that Prerequisite 1.3.e of GCL-3 required operators to verify checklist (CL) 12.6

was completed. The CL 12.6 contained a step to ensure the steam supply to the AFW P-8B was in automatic.

During review of the procedures used for startup, the inspectors noted that most of GCL-2 (including the AFAS checks) was signed off as "N/A" (Not Applicable) for this startup. The operators indicated that this was because GCL-2 is part of procedure GOP-2, "Mode 5 to Mode 3 < or = 525F." The operators reasoned that all equipment required for Mode 3 was correctly aligned since the plant was always in Mode 3 > 525F. In addition, the inspectors noted that Step 1.3.e of GCL-3 was also marked as "N/A." The inspectors concluded the complexity of referring to multiple procedures and checklists (some of which could be legitimately marked as "N/A," others which should be performed) was not an appropriate nor effective means to ensure safety systems were aligned for critical operations.

In addition to the startup, shutdown, and feedwater procedures, the inspectors identified weaknesses in the procedure for conducting shift turnovers. Control room watchstanders are required to walk down the main control room boards as part of watchstander turnover in accordance with Fleet Procedure, FP-OP-COO-01, "Conduct of Operations," Attachment 14. The site specific procedure, Administrative Procedure 4.14, "Conduct of Operations," Attachment 14, included a line item to "review control consoles and alarm status" (SROs) and "board walkdown" (ROs) prior to taking the shift. However, there is no guidance on what to verify and what detail is required.

Analysis: The inspectors determined that failure to have adequate procedures for AFW control in shutdown operations and failing to have adequate guidance for AFW startup checks is a performance deficiency and a finding. The finding is more than minor because the finding was associated with the Mitigating System Cornerstone attribute of Procedure Quality and affected the cornerstone objective of ensuring the availability of the AFW system. Specifically, inadequate procedural guidance resulted in operators not placing or maintaining the AFW system in an operable condition.

The inspectors completed a significance determination of this finding using IMC 0609, Appendix A, "Determining the Significance of Reactor Inspection Findings for At - Power Situations," dated November 22, 2005. The inspectors answered "yes" to screening Question 2 in the SDP Phase 1 Screening Worksheet under the Mitigation Systems Cornerstone column. Specifically, this finding resulted in the AFW system being incapable of performing its function and being inoperable beyond the limiting condition for operation. Thus a Phase 2 evaluation was required. The inspectors determined that the risk evaluation for this finding was similar to NCV 05000255/2006014-01 which concluded that the total Δ CDF considering internal events, external events, and LERF was less than 1×10^{-6} . Therefore, the failure to have adequate procedures for AFW control in shutdown operations and failing to have adequate guidance for AFW startup checks was also determined to be of very low safety significance (Green) by evaluation through the Phase 2 and Phase 3 processes.

This finding had a cross-cutting aspect in the area of Human Performance because the licensee did not plan or coordinate shutdown activities relating to AFW operation. The licensee inappropriately relied on pre-job briefings as a compensatory action in lieu of written instructions.

Enforcement: 10 CFR Part 50, Appendix B, Criterion V requires, in part, activities affecting quality shall be prescribed by documented instructions or procedures of a type appropriate to the circumstances. The licensee implemented start-up procedure, GOP-3, "Mode 3> or = 525F to Mode 2" (Revision 20), shutdown procedure GOP-8, "Power Reduction and Plant Shutdown to Mode 2" (Revision 22) and system operation procedure, SOP 12, Feedwater System (Revision 47) as procedures governing these quality activities. Contrary to the above, these procedures were not appropriate for the circumstances because the procedures lacked required instructions to adequately start AFW during shutdown and verify operability prior to startup. However, because this violation was of very low safety significance and because the issue was entered into the licensee's corrective action program (AR01059768) this violation is being treated as an NCV, consistent with Section VI.A.1 of the NRC Enforcement Policy (NCV 05000255/2006014-03). The licensee took action to put in place a detailed checklist to review safety systems on a periodic basis as part of shift activities. In addition the licensee initiated a root cause analysis and actions are being taken to upgrade those procedures.

6. Determine the Extent Training Related to Procedure Compliance- (Charter Item 6)

a. Inspection Scope

The inspectors reviewed the training materials related to Conduct of Operations and procedure compliance. Additional operators and training personnel were interviewed relative to how procedure compliance is addressed in initial and requalification training.

b. Findings and Observations

The inspectors found that training on Conduct of Operations and procedure compliance is being provided. Additionally, operators and training personnel report that verbatim procedure compliance and place keeping is required during simulator based training and testing.

No findings related to procedure compliance training were identified.

7. Identify Actions Taken in Response to this Event- (Charter Item 7)

a. Inspection Scope

The inspector reviewed the actions taken by the licensee as early corrective actions.

b. Findings and Observations

The licensee's early corrective actions included placing a temporary hold on the November 3, 2006, startup to verify all other safety systems were properly aligned. This action was observed by the inspector that identified the AFW alignment error. A detailed control room panel checklist is now required to be used on each shift to verify proper switch alignment. The operator who made the error was temporarily removed from control room duty. A 24-hour management control room observation program was initiated. Additionally, Operations management briefed each operating crew on the AFW event and its significance. The inspectors observed the increased control room

management presence, and attended two of the operating crew event briefings. Based on the reaction of the operating crews observed during the event briefing, the briefings appeared to be effective in communicating the seriousness of the event.

No findings related to the site early corrective actions were identified.

8. Determine if the Licensee is Performing a Root Cause Analysis - (Charter Item 8)

a. Inspection Scope

The inspectors reviewed the root cause analysis team charter and the makeup of the team. Additionally, the inspectors tracked the root cause team progress and reviewed the draft and final root cause analysis reports.

b. Findings and Observations

The inspectors found the root cause team to be well qualified and systematic in their investigation of the event. The inspectors also reviewed the root cause analysis report and found its conclusions to be consistent with those of the NRC review. Corrective actions to prevent recurrence outlined in the report were found to be logical when compared to the root causes identified in the report.

No findings related to the licensee root cause investigation were identified.

9. Conduct Control Room and Shift Turnover Observations- (Charter Item 9)

a. Inspection Scope

Three control room shift turnover observations were made as part of the inspection.

b. Findings and Observations

The control room shift turnover observations conducted by the inspectors all took place after the early corrective actions of an increased management control room observations, the use of a detailed control room panel alignment checklist, and management briefing of each operating crew on the event were implemented. Control room demeanor and practices appeared orderly and consistent with the site conduct of operation and those seen at other sites.

No findings related to control room and shift turnover practices were identified.

4OA6 Meetings

.1 Exit Meeting

The inspectors presented the inspection results to Mr. P. Harden and other members of licensee management on November 17 and December 21, 2006. Licensee personnel

acknowledged the findings presented. The inspectors asked licensee personnel whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

- ATTACHMENT:
1. SUPPLEMENTAL INFORMATION
 2. SPECIAL INSPECTION TEAM CHARTER
 3. TIMELINE

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Nuclear Management Company, LLC.

P. Harden, Site Vice-President
G. Hettel, Plant General Manager
L. Blocker, Operations Manager
K. Yeager, Assistant Operations Manager
G. Baustian, Training Manager
B. Dotson, Site Compliance

Nuclear Regulatory Commission

C. Pederson, Director, Division of Reactor Safety
H. Peterson, Chief, Operations Branch Division of Reactor Safety
J. Ellegood, Palisades Senior Resident Inspector
A. Garmoe, Reactor Engineer
J. Giessner, Palisades Resident Inspector
B. Palagi, Senior Operations Engineer - Team Leader
C. Zoia, Operations Inspector

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened and Closed

05000255/2006014-01	NCV	Failure to follow operating procedures (Section 4OA3.3.b)
05000255/2006014-02	NCV	Failure to comply with Technical Specifications (Section 4OA3.4.b)
05000255/2006014-03	NCV	Failure to provide adequate procedures (Section 4OA3.5.b)

Discussed

None

LIST OF DOCUMENTS REVIEWED

The following is a list of documents reviewed during the inspection. Inclusion on this list does not imply that the NRC inspectors reviewed the documents in their entirety but rather that selected sections or portions of the documents were evaluated as part of the overall inspection effort. Inclusion of a document on this list does not imply NRC acceptance of the document or any part of it, unless this is stated in the body of the inspection report.

Drawing E-196 (sheets 1-10), Schematic Diagram Motor Driven Auxiliary Pump;
Revision 4

Drawing M-205, Piping and Instrument Diagram Main Steam and Auxiliary Turbine Systems;
Revision 64

Drawing E-238, Schematic Diagram Auxiliary Feedwater System; Revision 28

Design Basis Document (DBD) 1.03; Revision 7

General Operating Procedure (GOP)-8, Power Reduction and Plant Shutdown to Mode 2;
Revision 22

GOP-3, Mode 3 > or = 525F to Mode 2; Revision 20

GOP-4, Mode 2 to Mode 1; Revision 17

SOP-12, Feedwater System; Revision 47

AR01059768, Auxiliary Feedwater Pumps Not Aligned For "Auto" Operation; dated
November 3, 2006

AR01060440, Procedure Rules of Usage Not Followed; dated November 10, 2006

AR01060549, AFW Flow Control Valves Taken to Manual in Mode 3; dated November 8, 2006

Prejob Brief GOP-8 Power Reduction and Plant Shutdown; dated November 1, 2006

Fleet Procedure FP-G-DOC-03, Procedure Use and Adherence; Revision 1

Plant Computer Printouts for AFW Flow and SG Level November 1, 2006

Event Log Reports for Main Turbine, AFW pumps, Reactor Parameters; dated November 1,
2006

Administrative Procedure 4.14, Conduct of Operations; Revision 8

Fleet Procedure, FP-OP-COO-01, Conduct of Operations; Revision 2

Administrative Procedure 4.02, Control of Equipment; Revision 35

Control Room Logs, November 1 through November 3, 2006

Administrative Procedure 4.00, Operations Organization, Responsibilities, and Conduct; Revision 31

Licensee provided Work Hours (3 months) for November 1, 2006 Operations Shift

SOP 40, Attachment 1, Control room "Black Dot" checklist for Power Operations; Revision 8

Lesson Plan PAL-LOR-03E-LP3, Auxiliary Feedwater System Review; Revision 0

Lesson Plan PL-ILT-601291, Integrated Plant Operations; Revision 14

Lesson Plan PL-LOR-05E-001S, EOP-3.0 Station Blackout; Revision 0

Lesson Plan PL-LOR-05B-001S, SG Tube Leak and SGTR; Revision 0

Lesson Plan PL-LOR-06E-004S, Loss of Feedwater; Revision 0

Lesson Plan PL-LOR-05E-002S, EOP-9.0 Success Path HR; Revision 0

Lesson Plan PL-LOR-04D-002S, ONP-25.1 and 25.2 Exercise; Revision 0

Lesson Plan PL-LOR-05A-002S, EOP-3.0 Safe Shutdown, Appendix R; Revision 0

Lesson Plan PL-LOR-05B-003S, Appendix R Exercise; Revision 0

Lesson Plan PL-LOR-JIT-003S, Turbine Generator Startup and Power Escalation; Revision 7

Lesson Plan PL-LOR-JIT-004S, Plant Shutdown to Mode 2 or 3; Revision 6 (e2)

Lesson Plan PL-601284, Advanced AFW Systems Training; Revision 2

Simulator Guide PL-JIT-05.SEG, Plant Shutdown to Mode 2 from 25 Percent Power; Revision 3 (e2)

Task-to-Training Matrix for Auxiliary Feedwater System; dated November 7, 2006

LM-324 Task List for Lesson Plan: PL-AFW; dated November 9, 2006

Simulator Deviations Currently Approved by SRB/SRC; last entry dated October 11, 2006

Cycle Design Matrix for LOR Cycle 03E; November 3, 2003 to January 14, 2004

NMC Fleet Training Program Description FL-LOR-TPD; Revision 0

RFI 28, Explaining why LOR Training on AFW was not provided in 2005; dated November 15, 2006

LIST OF ACRONYMS USED

AFAS	Auxiliary Feedwater Actuation Signal
AFW	Auxiliary Feedwater
ATC	At The Controls
BOP	Balance of Plant
CAP	Corrective Action Program Document
CDF	Core Damage Frequency
CFR	Code of Federal Regulations
CRS	Control Room Supervisor
DRP	Division of Reactor Projects
DRS	Division of Reactor Safety
GOP	General Operating Procedure
IMC	Inspection Manual Chapter
IPE	Individual Plant Examination
IPEEE	Individual Plant Examination of External Events
LERF	Large Early Release Frequency
MD	Management Directive
N/A	Not Applicable
NCO	Nuclear Control Operator
NCV	Non-Cited Violation
NRC	Nuclear Regulatory Commission
OA	Other Activities
RO	Reactor Operator
SDP	Significance Determination Process
SG	Steam Generator
SRA	Senior Risk Analyst
SRO	Senior Reactor Operator
STA	Shift Technical Advisor
SM	Shift Manager

PALISADES SPECIAL INSPECTION CHARTER

This Special Inspection Team is chartered to assess the circumstances surrounding the deviation from the required safety system lineup of the auxiliary feed water system during a reactor shutdown and subsequent reactor startup on November 1 and 3, 2006, respectively. The Special Inspection will be conducted in accordance with Inspection Procedure 93812, "Special Inspection," and will include, but not be limited to, the items listed below.

1. Identify the time-line for the event. Include plant conditions, system line ups, and operator actions.
2. Determine what licensed personnel were in the control room during the period of interest of November 1-3, 2006, their respective years-of-experience and work-week work-hour status. Additionally, determine the presence in the control room of any quality assurance personnel or senior managers providing oversight of the reactor shutdown and startup. In addition, verify that there were no undue distractions or excessive pressure to shutdown or restart the reactor.
3. Identify which procedures were being used during the shutdown and startup. Based on these procedures determine the required lineup for the auxiliary feed water system. Additionally, review the procedures describing shift turnover and conduct of operations regarding board walkdowns and system status.
4. Interview, if possible, the operator who placed the auxiliary feed water system outside of the established lineup. Determine the operator's reasoning for making the change and failure to communicate the change. Also, interview selected operators from other shifts who apparently did not identify the auxiliary feed water system misalignment during subsequent shift turnovers. In addition, review operator logs to determine what, if any, information was documented with respect to the auxiliary feed water system lineup.
5. Determine the adequacy of both the shutdown and startup procedures used on November 1 and 3, respectively. Include in this determination, the extent of training provided to the operating crews including Just-in-Time training for both shutdown and startup activities.
6. Determine the extent of training provided to the operating crew and the licensee's expectations with respect to conduct of operations concerning knowledge based and verbatim compliance for procedural use.
7. Identify any actions that the licensee took in response to the event (e.g., briefings on the event, informing staff and managers of expectations, enhanced training, enhanced management oversight, review of other recent procedure changes, disciplinary actions).
8. Determine if the licensee is performing a root cause. As available, evaluate the scope, schedule, and staffing of the licensee's root cause investigation of the event.
9. Conduct control room and shift turnover observations to determine extent of condition and assessment of the licensee's readiness with respect to continued safe plant operations.
10. Document the results of the Special Inspection in Inspection Report 05000255/2006014.

Timeline of Events Surrounding Palisades AFW Pump Controller Mispositioning

Date	Time	Description	On-Shift Personnel	Plant Operating Mode
11/01/2006	~ 12:30	RO1 Arrives 3 hours early for licensing physical		
11/01/2006	15:30	Entered TS 3.6.1 for VHX-4 CAC SW leak		
11/01/2006	16:00		Shift 5 has watch: SM: SRO1, SE: SRO2, CRS: SRO3 NCOs: RO1 (ATC), RO2 (BOP), RO3 (extra)	Mode 1
11/01/2006	16:30	Entered TS 3.6.1 requiring entry into Mode 3 within 6 hours and Mode 5 within 36 hours		
11/01/2006	17:00	Pre-Job brief conducted by operating crew to prepare for entry into Mode 3		
11/01/2006	18:05	Began driving rods in and borating to reduce power. These actions continued for a few hours.		
11/01/2006	18:12	Adjusted turbine controls to accommodate downpower		
11/01/2006	19:55	Placed 2A Main Feedwater Pump turbine controller in manual		
11/01/2006	~20:00		RO4 relieves RO3	
11/01/2006	20:57	Aligned chemical addition to inject into AFW suction once AFW is started		
11/01/2006	21:30	Secured 2A Main Feedwater Pump		
11/01/2006	21:33	Transferred 4160 V Busses to startup power		
11/01/2006	21:47	Turbine No-Load Trip Annunciator (starts 60s turbine trip timer) cut-off final pre-job brief for the turbine and reactor trip		
11/01/2006	21:48	Detailed sequence of events surrounding reactor trip:		
		21:48:20 Turbine trip		
		21:48:27 Shut down heater drain pump A		
		21:48:37 Start AFW Pumps 8A and 8B		Mode 1
		21:48:48 Reactor Trip		
		21:48:50 Trip Main Feedwater Pump 2B		
		21:52:12 Stopped AFW Pump 8A		Mode 3

Date	Time	Description	On-Shift Personnel	Plant Operating Mode
		<i>Control of AFW was turned over from a dedicated NCO (RO3) to the NCO At The Controls (RO1). Minor SG level oscillations were identified so the NCO ATC placed the AFW Pump controllers in manual to preclude an Aux Feed Actuation Signal. This occurred within approximately 1 minute of stopping the 8A AFW Pump.</i>		
11/01/2006	21:59	Verified all rods inserted		
11/02/2006	0:15		Shift 2 has watch: SM: SRO4 SE: SRO5 CRS: SRO6 NCOs: RO1, RO2, RO4	
11/02/2006	3:42		RO5 relieved RO1	
11/02/2006	8:02		Shift 4 has watch: SM: SRO7 SE: SRO8 CRS: SRO9 NCOs: RO3, RO6	
11/02/2006	14:36	Entered TS 3.0.3 due to both HPSI trains declared inoperable		
11/02/2006	15:20	VHX-4 repaired and restored		Mode 3
11/02/2006	16:26		Shift 1 has watch: SM: SRO10 SE: SRO 11 CRS: SRO12 NCOs: RO7, RO8, RO9	
11/02/2006	18:34	EDG 1-1 declared Operable		
11/02/2006	19:10	Made 8 hr report to NRC for both HPSI trains inoperable		
11/02/2006	23:00		Shift 2 has watch: SM: SRO4 SE: SRO5 CRS: SRO6 NCOs: RO1, RO4	
11/03/2006	6:53	Exited TS for HPSI inoperability as both trains now declared operable		

Date	Time	Description	On-Shift Personnel	Plant Operating Mode
11/03/2006	7:41		Shift 4 has watch: SM: SRO7 SE: SRO8 CRS: SRO9 NCOs: RO3, RO6, RO10	
11/03/2006	16:00		Shift 1 has watch: SM: SRO13 SE: SRO11 CRS: SRO7 NCOs: RO7, RO10, RO9	Mode 3
11/03/2006	17:46	The plant enters Mode 2		
11/03/2006	18:34	Following NRC Resident Identification that AFW Pumps are in manual, Ops places pumps in auto		Mode 2
11/03/2006	19:19	The Reactor is Critical		
11/03/2006	19:25	Shift Outage Director calls Plant Manager to inform of mispositioning event. Ops Manager and Asst. Ops Manager included in conversations on whether to continue startup		
11/03/2006	19:35	Site VP notified		
11/03/2006	19:40	Further discussions on how mispositioning occurred and when to continue startup		
11/03/2006	20:31	Plant Manager on-site and updated. Update includes that NCO apparently placed handswitches in manual when transitioning from Main Feed Pumps to Aux Feed Pumps		
11/03/2006	21:29	Ops Manager on-site. Orders individual involved to be relieved from control room watch. Individual involved was in the simulator at the time.	NCO who mispositioned AFW pump controller switches is removed from shift	
11/03/2006	22:25	Ops Manager interviewed individual involved (NCO who placed handswitch in manual)		
11/03/2006	22:40	Instituted 100% peer check policy	"A" Operating Shift Standdown	
11/03/2006	23:44		Shift 5 has watch: SM: SRO4 SE: SRO10 CRS: SRO3 NCOs: RO6, RO2	
11/04/2006	0:00	Conducted control panel status check of handswitches and instituted human performance event investigation		
11/04/2006	0:15	Permission given for operating crew to continue with startup and power escalation		

Date	Time	Description	On-Shift Personnel	Plant Operating Mode
11/04/2006	0:30	Implemented additional Mgmt oversight of control room		Mode 2
11/04/2006	7:33	The plant has entered Mode 1		
11/04/2006	7:40		"B" Operating Shift Standdown	Mode 1
11/04/2006	8:14		Shift 3 has watch: SM: SRO1 SE: SRO14 CRS: SRO15 NCOs: RO5, RO11,RO12	
11/04/2006	9:17	Generator synchronized to the grid		
11/04/2006	11:03	Control Room Black Dot Checklist for Power Operations will be performed shiftly until further notice per Ken Yeager, Asst. Ops Mgr		
11/04/2006	13:00	Fleet Challenge Board conducted		
11/04/2006	15:40		"C" Operating Shift Standdown	
11/04/2006	20:37	Made 8 hr notification to NRC for AFW mispositioning		
11/05/2006	10:00	Determined membership for Root Cause Evaluation Team		
11/05/2006	10:56	Site Clock Reset		
11/06/2006	7:00	Site-wide standdowns conducted		
11/06/2006	14:30	14-day Root Cause Evaluation begins		
11/06/2006	17:00	Additional Fleet Challenge Board conducted		Mode 1