September 18, 2001

Mr. R. P. Powers
Senior Vice President
Nuclear Generation Group
American Electric Power Company
500 Circle Drive
Buchanan, MI 49107-1395

SUBJECT: D. C. COOK NUCLEAR POWER PLANT, UNITS 1 AND 2
NRC INSPECTION REPORT 50-315/01-14(DRP); 50-316/01-14(DRP)

Dear Mr. Powers:

On August 18, 2001, the NRC completed an inspection at your D. C. Cook Nuclear Power Plant, Units 1 and 2. The enclosed report documents the inspection findings which were discussed on August 21, 2001, with you and other members of your staff.

This inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

Based on the results of this inspection, the inspectors identified two issues of very low safety significance (GREEN). These issues were determined to involve violations of NRC requirements. However, because of their very low safety significance and because these issues have been entered into your corrective action program, these violations are being treated as Non-Cited Violations, in accordance with Section VI.A.1 of the NRC's Enforcement Policy. An additional finding involved several examples of ineffective corrective actions for degraded conditions. This additional issue was determined to be a NO COLOR finding related to the problem identification and resolution cross cutting performance area. If you deny any Non-Cited Violation, you should provide a response with the basis for your denial, within 30 days of the date of this inspection report, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region III; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-001; and the NRC Resident Inspector at the D. C. Cook facility.

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Sincerely,

Original signed by
Anton Vegel

Anton Vegel, Chief
Branch 6
Division of Reactor Projects

Docket Nos. 50-315; 50-316
License Nos. DPR-58; DPR-74

Enclosure: Inspection Report 50-315/01-14(DRP);
50-316/01-14(DRP)

cc w/encl: A. C. Bakken III, Site Vice President
J. Pollock, Plant Manager
M. Rencheck, Vice President, Nuclear Engineering
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U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket Nos:	50-315; 50-316
License Nos:	DPR-58; DPR-74
Report No:	50-315/01-14(DRP); 50-316/01-14(DRP)
Licensee:	American Electric Power Company
Facility:	D. C. Cook Nuclear Power Plant, Units 1 and 2
Location:	1 Cook Place Bridgman, MI 49106
Dates:	July 1, 2001 through August 18, 2001
Inspectors:	B. L. Bartlett, Senior Resident Inspector K. A. Coyne, Resident Inspector J. D. Maynen, Resident Inspector
Approved by:	Anton Vegel, Chief Branch 6 Division of Reactor Projects

SUMMARY OF FINDINGS

IR 05000315-01-14(DRP), IR 05000316-01-14(DRP), on 07/01-08/18/2001, Indiana Michigan Power Company, D.C. Cook Nuclear Power Plant, Units 1 and 2. Resident Inspector Report. Adverse Weather Protection, Maintenance Risk Assessments and Emergent Work Control, Operability Evaluations, Identification and Resolution of Problems.

This report covers a 6-week routine inspection. The inspection was conducted by resident and Region III inspectors. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using IMC 0609 "Significance Determination Process" (SDP). The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described at its Reactor Oversight Process website at http://www.nrc.gov/NRR/OVERSIGHT/index.html. Findings for which the SDP does not apply are indicated by "No Color" or by the severity level of the applicable violations.

A. Inspector Identified Findings

Cornerstone: Mitigating Systems

- GREEN. A non-cited violation was identified for the failure to promptly correct a condition adverse to quality. Specifically, abnormal ductwork vibration on the Unit 2 Control Room Instrument Distribution (CRID) ventilation system was identified in May 1999 and compensatory actions were implemented. However, in April 2001, and on multiple occasions in July 2001, the condition recurred, requiring operator action to temporarily correct the condition. The inspectors concluded that the licensee's failure to properly correct or compensate for the abnormal ductwork vibration on the Unit 2 CRID ventilation system constituted a Non-Cited Violation of 10 CFR 50, Appendix B, Criterion XVI.

  The inspectors evaluated the risk significance of this issue using the Significance Determination Process. Because the Unit 2 CRID inverter room temperature never exceeded the design temperature no actual loss of safety function occurred. Consequently, this issue was screened as GREEN (very low risk significance) after a Phase 1 Significance Determination Process review. (Section 1R01)

- GREEN. A non-cited violation was identified for the failure to implement corrective actions to prevent repetitive occurrences of water intrusion into the Unit 1 West motor driven auxiliary feedwater pump (MDAFWP) bearing housing. Specifically, in 1998, the licensee identified the potential for water intrusion into the auxiliary feedwater pump bearing housings; however, the licensee failed to implement effective corrective actions to prevent recurrence of bearing water intrusion. Subsequently, water contamination of the bearing oil was identified on February 1, 2001 and July 2, 2001. The inspectors determined that water intrusion into the MDAFWP bearing housing constituted a significant condition adverse to quality. Therefore, the inspectors concluded that this failure constituted a Non-Cited Violation of 10 CFR 50, Appendix B, Criterion XVI.

The inspectors evaluated the risk significance of this issue, using the Significance Determination Process, and concluded that water intrusion into the AFW pump bearing could affect the reliability of the auxiliary feedwater system. Because the inspectors promptly identified this issue, the licensee mitigated bearing water intrusion prior to an actual loss of auxiliary feedwater pump operability. Consequently, this issue was screened as GREEN (very low risk significance) after a Phase 1 Significance Determination Process review. (Section 1R15)

Cross-Cutting Issues: Problem Identification and Resolution

- NO COLOR. The inspectors identified that the licensee failed to adequately identify and resolve conditions adverse to quality on the Unit 1 West auxiliary feedwater system and the Unit 2 safety-related ventilation system which could have a credible impact on safety if left uncorrected. The inspectors determined that licensee performance weaknesses in the problem identification and resolution area do not impact a specific reactor safety cornerstone. However, the inspectors concluded that these additional failures to correct conditions adverse to quality provide substantive information relating to the problem identification and resolution cross-cutting area. Additionally, these issues relate to a previously identified finding regarding the licensee's failure to implement adequate corrective actions for Maintenance Rule violations (FIN 50-315/01-07-02). Because of the historical finding and the cross-cutting aspects of problem identification and resolution, the inspectors concluded that these additional corrective action program weaknesses constituted a NO-COLOR Finding. (Section 4OA2)

B. Licensee Identified Findings

No findings of significance were identified.

Report Details

Summary of Plant Status:

Unit 1 began this inspection period in Mode 1 (Power Operation) at approximately 30 percent power to support biocide treatment of the circulating water system. On July 2, 2001, the unit was placed in Mode 2 (Reactor Startup). The unit was returned to full power on July 6, 2001, and remained at or near full power for the remainder of the inspection report period.

Unit 2 began this inspection period at about 50 percent power to support biocide treatment of the circulating water system. The unit was returned to full power on July 4, 2001. On August 10, 2001, a Technical Specification (TS) required shutdown was commenced due to inoperability of two auxiliary feedwater pumps. After restoration of the auxiliary feedwater system, the TS required shutdown was stopped after power was reduced to a minimum of 75 percent. The unit was returned to full power on August 11, 2001 and remained at or near full power for the remainder of the inspection report period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

1R01 Adverse Weather (71111.01)

a. Inspection Scope

The inspectors reviewed the licensee's procedures and preparations for high temperature, high wind, and flooding conditions. The inspectors reviewed severe weather procedures, emergency plan implementing procedures related to severe weather, annunciator response procedures, and performed general area walkdowns. Additionally, the inspectors reviewed condition reports and the identification and resolution of equipment deficiencies associated with adverse weather mitigation.

The inspectors reviewed annunciator response procedures for high temperature conditions or loss of ventilation to several safety-significant areas, including the switchgear rooms, the essential service water (ESW) pump rooms, and the Control Room Instrumentation Distribution (CRID) inverter rooms. The inspectors walked down risk significant areas that could be affected by severe weather, including areas outside the auxiliary and turbine buildings, and the fire pump house. During the walkdowns, the inspectors observed housekeeping conditions and verified that material capable of becoming an airborne missile hazard during high wind conditions or severe weather was appropriately restrained.

b. Findings

The inspectors identified that the licensee failed to promptly correct a condition adverse to quality associated with degraded operation of the Unit 2 Control Room Instrument Distribution (CRID) ventilation system. The Unit 2 CRID ventilation system consisted of

two parallel 100 percent capacity fans and associated common ventilation ductwork which cooled the 120 volt AC vital bus safety related power supplies. On several occasions in July 2001, the licensee identified that abnormal ductwork vibrations were occurring in the system. Previously, the licensee had identified and evaluated a similar condition.

In May 1999, the licensee identified abnormal ductwork vibration on the Unit 2 CRID ventilation system. Condition Report 99-10357 was written to document the condition and the apparent cause evaluation. After this issue was identified in 1999, the licensee placed the Unit 2 CRID ventilation system in an abnormal lineup which prevented the backup fan from running. Because this lineup was not acceptable for Mode 4 operability, the licensee restored the normal lineup prior to restart of Unit 2. In May 2000, the licensee's apparent cause evaluation determined that the ductwork vibrations were due to an adverse fan-to-fan interaction in the system which occurred when both 100 percent capacity Unit 2 CRID inverter room ventilation fans running simultaneously. The licensee concluded that because the ductwork was not large enough to support ventilation flow from both fans, simultaneous Unit 2 CRID ventilation fan operation resulted in abnormal ductwork vibration. The Unit 2 CRID ventilation system originally included two 50 percent fans, but sometime in the late 1980s, the fans were replaced with 100 percent capacity fans to account for single failure considerations; however, the control circuitry was not modified to prevent both fans from running at the same time. The licensee also noted that the simultaneous Unit 2 CRID ventilation fan operation would only occur when environmental conditions caused the backup fan to start while the lead fan was already running. The Unit 2 CRID ventilation system was not always susceptible to this phenomenon.

The actions associated with CR 99-10357 included the development of a permanent correction to solve the abnormal ductwork vibration. However, in March 2000, licensee management determined that the permanent correction to the Unit 2 CRID ventilation system would be a post-restart item. In May 2000, an additional compensatory action to allow Mode 4 entry was implemented to raise the temperature setpoint for starting the backup fan and increase the temperature switch dead band to preclude simultaneous operation of both Unit 2 CRID ventilation fans. Because this compensatory action did not prevent the CRID room temperature from exceeding the design basis temperature, the licensee did not consider the temperature switch change to be a permanent correction; thus, the system was considered operable but degraded.

In April 2001, the licensee identified that the abnormal ductwork vibration had recurred. Condition Report 01097014 was written to document the vibration and the licensee's evaluation of the condition. The licensee concluded that temperature switch setpoint drift coupled with external environmental conditions resulted in the abnormal ductwork vibration. In June 2001, the licensee recalibrated the temperature switches; however, on multiple occasions during July 2001 the abnormal ductwork vibration of the Unit 2 CRID ventilation system recurred. During these instances, the licensee directed an operator to work around the problem by taking both fan switches to off for a short period of time and then restoring the normal system lineup to temporarily stop the abnormal ductwork vibration. On August 4, 2001, new temperature switches were calibrated and installed; however, less than 12 hours later, the licensee again noted abnormal ductwork vibration. The licensee performed additional investigation and determined that the

cause of the ductwork vibration was not simultaneous operation of both CRID ventilation fans as originally documented in CR 99-10357. Instead, the licensee determined that temperature control damper oscillations, under certain environmental conditions, led to periodic fan air flow pulsations and consequent ductwork vibration.

10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," required in part that measures shall be established to assure that conditions adverse to quality are promptly identified and corrected. Contrary to the above, the licensee failed to promptly correct a condition adverse to quality, abnormal ductwork vibration on the Unit 2 CRID ventilation system. This condition was documented in May 1999, and compensatory actions were implemented to ensure system operability; however, in April 2001, and on multiple occasions in July 2001, the abnormal ductwork vibration recurred, requiring additional compensatory actions in the form of an operator workaround to temporarily stop the abnormal ductwork vibration. The inspectors concluded that the licensee's failure to properly evaluate and implement proper corrective or compensatory actions to correct the abnormal ductwork vibration on the Unit 2 CRID ventilation system constituted a violation of NRC requirements.

The inspectors evaluated this finding using the Significance Determination Process (SDP) and concluded that the failure to correct the abnormal ductwork vibration on the Unit 2 CRID ventilation system was an issue of very low risk significance (GREEN). Recurrent abnormal ductwork vibration would continue to degrade the Unit 2 CRID ventilation system to the point that system operability would be affected. However, no actual loss of safety function occurred because the Unit 2 CRID inverter room temperature never exceeded the design temperature of the CRID equipment. In addition, following each occurrence of abnormal ductwork vibration, the operators implemented prompt actions to restore normal CRID ventilation system operation. Since this issue was determined to have very low risk significance and was characterized as Green by the SDP, this violation is being treated as a Non-Cited Violation of 10 CFR 50, Appendix B, Criterion XVI, consistent with Section VI.A of the NRC Enforcement Policy **(NCV 50-316/01-14-01**). This violation is in the licensee's corrective action program as CR 01196002.

1R04 Equipment Alignment (71111.04)

a. Inspection Scope

The inspectors performed partial system walkdowns of the following four risk-significant systems:

Initiating Events Cornerstone

- Unit 1 Non-Essential Service Water System

Mitigating Systems Cornerstone

- Unit 2 Train “B” Emergency Diesel Generator
- Unit 1 Auxiliary Feedwater System
- Unit 2 Emergency Core Cooling System

The inspectors selected these systems based on their risk significance relative to each reactor safety cornerstone. The inspectors reviewed operating procedures, TS requirements, Administrative Technical Requirements (ATRs), system diagrams, and the impact of ongoing work activities on redundant trains of equipment in order to identify conditions that could have rendered these systems incapable of performing their intended functions.

b. Findings

No findings of significance were identified.

1R05 Fire Protection (71111.05)

.1 Routine Fire Zone Tours

a. Inspection Scope

The inspectors performed fire protection walkdowns of the following four risk-significant plant areas:

- Auxiliary Building 573 ft. elevation (Fire Zone 1)
- Pump Bay, Turbine Building 569 ft. elevation (Fire Zone 2)
- Auxiliary Building 633 ft. elevation (Fire Zone 52)
- Turbine Room Miscellaneous Oil Room (Fire Zone 89)
- Turbine roof elevation 712 (top of Fire Zone 129 and 130)

The inspectors verified that fire zone conditions were consistent with assumptions in the licensee’s fire hazard analysis. The inspectors walked down fire detection and suppression equipment, assessed the material condition of fire control equipment, and evaluated the control of transient combustible materials.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification (71111.11)

a. Inspection Scope

On August 8, 2001, the inspectors observed Operations Shift “C" during simulator training. The shift performed a scenario designed to exercise the use of Emergency Operating Procedure 02-OHP 4023.ECA-1.1, “Loss of Emergency Coolant Recirculation.” The inspectors assessed communications and implementation of

emergency operating procedures. In addition, the inspectors attended the licensee's critique following performance of the simulator scenarios.

b. Findings

No findings of significance were identified.

1R12 Maintenance Rule Implementation (71111.12)

The inspectors evaluated the licensee's implementation of 10 CFR 50.65 (the Maintenance Rule) for the following six systems: non-essential service water, air recirculation/hydrogen skimmer system, main steam, residual heat removal, spent fuel pool ventilation, and ultimate heat sink. The inspectors assessed: (1) functional scoping in accordance with the Maintenance Rule; (2) characterization of system functional failures; (3) safety significance classification; (4) 10 CFR 50.65 (a)(1) or (a)(2) classification for system functions; and (5) performance criteria for systems classified as (a)(2) or goals and corrective actions for systems classified as (a)(1).

The inspectors have previously documented weaknesses in the licensee's implementation of the Maintenance Rule in NRC Inspection Reports 50-315/00-20, 50-316/00-20; 50-315/00-22, 50-316/00-22; 50-315/01-07, 50-316/01-07; and 50-315/01-09, 50-316/01-09. These Maintenance Rule implementation weaknesses were related to inadequate failure evaluations; system, structure, or component (SSC) performance monitoring; and effectiveness of corrective action for SSCs with identified performance problems. The licensee's corrective actions for these issues included additional training, re-evaluation of SSC Maintenance Rule functions and monitoring programs, and historical SSC performance reviews. At the time of this inspection, the licensee was still in the process of implementing corrective actions for these previously identified issues. Therefore, for instances when the inspectors identified issues associated with previously identified weaknesses, the inspectors assessed the effectiveness of planned corrective actions.

.1 Non-Essential Service Water

a. Inspection Scope

The inspectors reviewed the implementation of the Maintenance Rule requirements for both units' Non-Essential Service Water (NESW) systems. The NESW systems supplied cooling water to the plant air compressors, the control air compressors, and containment ventilation. In addition, the NESW system contained a number of valves which were required to operate to ensure containment isolation. Because a functional failure of the NESW system could lead to a plant trip, the inspectors determined that this system was associated with the Initiating Events cornerstone.

b. Findings

No significant findings were identified.

.2 Air Recirculation/Hydrogen Skimmer System

a. Inspection Scope

The inspectors reviewed the implementation of the licensee's Maintenance Rule program on both units' air recirculation and hydrogen skimmer (CEQ) systems. The inspectors also performed an independent review of the licensee's assessment of the historical performance of the CEQ systems. This system was selected because of its use in minimizing hydrogen buildup in containment post accident and its use in establishing flow through the ice condenser. Due to the CEQ system importance in maintaining post accident containment pressure, the inspectors determined that this system was associated with the Barrier Integrity cornerstone.

b. Findings

No significant findings were identified.

.3 Main Steam System

a. Inspection Scope

The inspectors reviewed the implementation of the Maintenance Rule requirements for the Main Steam (MS) system. Main steam functions included post accident heat removal, isolation capability in the event of a steam generator tube leak, steam supply to the turbine auxiliary feedwater pump and supplying steam to the main turbine during normal operation. Although failures of the main steam system had the potential of initiating a plant transient, the inspectors determined that the majority of system functions were associated with the Mitigating Systems cornerstone.

b. Findings

No findings of significance were identified.

.4 Residual Heat Removal System

a. Inspection Scope

The inspectors reviewed the implementation of the Maintenance Rule requirements for the residual heat removal (RHR) system. The licensee also monitored the performance of the emergency core cooling system as part of the residual heat removal monitoring. Consequently, the RHR system functions included shutdown decay heat removal and reactor coolant system pressure isolation functions in addition to emergency core cooling functions. At the time of the inspection, the licensee was still in the process of completing reviews of past RHR system performance as part of the corrective actions for previously identified maintenance rule violations. For items where the licensee had not completed corrective actions associated with maintenance rule implementation for the RHR system, the inspectors assessed planned actions to verify that previously identified weaknesses were adequately addressed. Because the majority of safety-related functions of the RHR system were involved with emergency core cooling and

decay heat removal, the inspectors determined that the majority of system functions were associated with the Mitigating Systems cornerstone.

b. Findings

No findings of significance were identified.

.5 Spent Fuel Storage Pool Exhaust Ventilation System

a. Inspection Scope

The inspectors reviewed the implementation of Maintenance Rule requirements for the spent fuel storage pool exhaust ventilation system (licensee system designator AFX). The review included the four spent fuel area supply fans, the suction around the spent fuel storage pool, the HEPA and charcoal filters and the two AFX exhaust fans. Because the AFX system serves primarily to prevent the spread of contamination beyond the auxiliary building following a postulated fuel handling or spent fuel pool cooling accident the inspectors determined that this system was associated with the Barrier Integrity cornerstone.

b. Findings

No findings of significance were identified.

.6 Ultimate Heat Sink

The inspectors reviewed the implementation of Maintenance Rule requirements for the Ultimate Heat Sink (UHS) System. The review included those portions of the Circulating Water System and the Circulating Water Screen-House that supported the UHS. Because the majority of system functions were involved emergency core cooling and decay heat removal, the inspectors determined that this system was associated with the Mitigating Systems cornerstone.

b. Findings

No findings of significance were identified.

1R13 Maintenance and Emergent Work (71111.13)

a. Inspection Scope

The inspectors reviewed the risk assessment and risk management for the following five risk significant maintenance activities:

Initiating Events Cornerstone

- Unit 2 North NESW pump motor replacement

Mitigating Systems Cornerstone

- Lubricate and clean Unit 1 East Component Cooling Water Pump
- Unit 1 West Essential Service Water Pump Oil Change and Relay Calibration
- Degraded Offsite Voltage During Unit 2 Turbine Driven Auxiliary Feedwater Pump Maintenance

Barrier Integrity Cornerstone

- Unit 1 Train "A" Solid State Protection System Power Supply Replacement

These activities were selected based on their risk impact to reactor safety cornerstones. For each of the above activities, the inspectors reviewed the scope of maintenance work, discussed the results of the assessment with the licensee's probabilistic risk analyst, and verified that plant conditions were consistent with the risk assessment. The inspectors also reviewed TS and ATR requirements and walked down portions of redundant safety systems, when applicable, to verify that risk analysis assumptions were valid and applicable requirements were met.

b. Issues and Findings

No findings of significance were identified.

1R14 Personnel Performance During Nonroutine Evolutions (71111.14)

.1 Unit 1 Power Reduction to Mode 2 (Reactor Startup)

a. Inspection Scope

On July 2, 2001, the licensee performed an unplanned Unit 1 power reduction to approximately 2 percent reactor power to support removal of the circulating water system from service. During biocide treatment, operations personnel secured the number 13 circulating water pump to reduce circulating water system flow rate. Because the number 13 circulating water pump discharge valve leaked by excessively, the number 13 circulating water pump was reverse rotating and could not be returned to service with any other circulating water pump in service. The inspectors assessed operator performance, including reactivity control, procedural adherence, and control room command and control, during the power reduction and mode change from Mode 1 to Mode 2.

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations (71111.15)

.1 Repetitive Occurrences of Water Intrusion Into the Unit 1 West Motor Driven Auxiliary Feedwater Pump (MDAFWP) Bearing Housing

a. Inspection Scope

On July 2, 2001, the licensee reduced power in order to enter Mode 2 to support circulating water system work activities. During this evolution, the licensee relied on the auxiliary feedwater system to provide steam generator makeup for approximately 28 hours. As discussed in Section 1R04 above, the inspectors performed a walk down of the AFW system while the system was aligned for normal steam generator makeup. During this walkdown, the inspectors identified a pump packing leak on the Unit 1 MDAFWP was spraying water onto the outboard bearing housing. The inspectors evaluated the potential operability impact associated with this packing leakage.

b. Findings

Because water impingement on the AFW bearing housing had resulted in water contamination of the bearing oil in the past, the inspectors immediately notified the control room of the condition. Although the Unit 1 control room senior reactor operator (SRO) promptly investigated the packing leakage, the operations crew did not initiate immediate actions to mitigate the water impingement of the bearing housing. Approximately 10 hours after the Unit 1 West MDAFWP was started, the licensee completed adjustments on the MDAFWP outboard packing and the source of the water spray on the bearing housing was stopped.

Approximately 28 hours after the MDAFWPs were started, the main feed water system was returned to service and the MDAFWPs were secured. After stopping the MDAFWPs, the licensee obtained four successive 100 ml oil samples from the West MDAFWP outboard bearing to determine the extent of potential water contamination. During the sampling process, the licensee removed approximately 20 ml of water from the outboard pump bearing housing. The licensee stated that no indications of bearing damage were found during oil sample analysis.

The licensee performed an operability determination to evaluate the impact of the water contamination of the bearing oil. The licensee concluded that the West MDAFWP was operable based, in part, on 28 hours of stable pump operation during the Mode 2 entry with approximately 20 ml of water contamination in the outboard bearing oil. The inspectors concluded that the licensee did not provide a sufficient basis for concluding that the MDAFWP would remain operable for its entire mission time without the potential need for compensatory measures to mitigate continual water intrusion into the bearing housing.

The inspectors reviewed the past performance history for the auxiliary feedwater system to determine if the licensee had experienced repetitive occurrences of bearing oil water contamination. The inspectors identified the following occurrences of bearing oil water contamination:

- Following routine surveillance testing on February 1, 2001, the licensee obtained a bearing lubricating oil sample from the Unit 1 West MDAFWP outboard bearing and determined that at least 100 ml of water had entered the bearing housing. The licensee initiated CR 01032008, evaluated the condition, and determined that bearing water intrusion was a repetitive issue. The licensee determined that the apparent cause of the condition was water spray impinging on the bearing housing from the interface between the stuffing box and the packing follower. The water spray could then enter the bearing housing via the housing cap. The evaluation stated that, due to the degraded condition of the packing gland, even with the packing compressed such that leakage was at a minimum, water could still spray out of the packing area between the packing stuffing box and the packing follower. Although CR 01032008 identified that this was a repetitive issue and had been closed, no corrective actions were specified in the condition report to either mitigate the effects of water spray on the bearing housing or correct the degraded condition of the packing stuffing box.

- On August 26, 1999, the licensee initiated CR 99-21501 to evaluate a generic condition associated with moisture intrusion into the auxiliary feedwater pump bearing lubricating oil. Condition Report 99-21501 was closed by reference to the evaluation of CR 99-1907, and CR 99-1907 was subsequently closed by reference to the evaluation for CR 98-7665. Condition Report 98-7665 was originally written to document particulate contamination in the bearing lubricating oil. The inspectors reviewed the evaluation associated with CR 98-7665 and determined that the licensee did not include an evaluation of moisture intrusion in CR 98-7665. Therefore, the inspectors determined that the original water intrusion problem reported in CR 99-21501 was closed without adequate evaluation or corrective action.

- On December 22, 1998, the licensee discovered water contamination of the Unit 1 West MDAFWP outboard bearing housing caused by water spray form the outboard pump packing gland follower. The evaluation for this issue, documented in CR 98-8317, concluded that water entered the bearing housing via the oil ring inspection cap. Corrective action 3 of CR 98-8317 specified actions to "install positive-sealing bearing housing vent caps to prevent water intrusion into the bearings," on all six of the auxiliary feedwater pumps. This corrective action was subsequently closed on April 8, 1999, after completing the specified actions on only one of the six AFW pumps.

The inspectors evaluated the risk significance of the licensee's failure to prevent repetitive occurrences of bearing oil water contamination using the Significance Determination Process. The auxiliary feedwater (AFW) system was relied upon to support secondary heat removal following a loss of normal feedwater and therefore was within the mitigating systems cornerstone. The inspectors determined that this issue was more than a minor concern because water contamination of the AFW pump bearing lubricating oil could credibly result in failure of the pump bearing, as happened in 1993, and subsequent failure of the AFW pump. Therefore, the inspectors concluded that water intrusion into the AFW pump bearing could affect the reliability of the auxiliary feedwater system. Because the inspectors promptly identified this issue, the licensee corrected the bearing water intrusion prior to an actual loss of auxiliary feedwater pump

operability. Therefore, this issue was screened as GREEN (very low risk significance) after a Phase 1 Significance Determination Process review.

10 CFR 50, Appendix B, Criterion XVI, "Corrective action," requires, in part, that measures shall be established to assure that conditions adverse to quality are promptly identified and corrected. Additionally, in the case of significant conditions adverse to quality, Criterion XVI requires, in part, that the measures shall assure that the cause of the condition is determined and corrective action is taken to preclude repetition. Contrary to the above, the licensee failed to take corrective actions to prevent repetitive occurrences of water intrusion into the Unit 1 West MDAFWP bearing housing. Specifically, the licensee identified adverse conditions associated with water intrusion in 1993, 1998, and 2001 but failed to implement effective corrective actions to prevent recurrence of bearing water intrusion. Because bearing water intrusion could lead to bearing failure and loss of the auxiliary feedwater pump, the inspector concluded that this condition represented a significant condition adverse to quality. The inspectors concluded that the failure to implement effective corrective actions for repetitive water intrusion into the Unit 1 West MDAFWP bearing housing constituted a **Non-Cited Violation (315/01-14-02)** of 10 CFR 50, Appendix B, Criterion XVI, consistent with Section VI.A. of the NRC Enforcement Policy. This violation is in the licensee's corrective action system as CR 01184086, CR 01183039, and CR 01186002.

.2 Operability of the Unit 1 West Motor Driven Auxiliary Feedwater Pump Room Cooler

a. Inspection Scope

During a walkdown of the Unit 1 auxiliary feedwater system on July 2, 2001, the inspectors noted that there was a large differential temperature from the north to south side of the Unit 1 West AFW pump room. The room cooler intake and discharge were located on the south end of the pump room and the West MDAFWP motor was located on the north side. The inspectors noted that the north end of the room was approximately 30°F warmer than the south side of the room. Additionally, the inspectors noted that the room high temperature alarm switch and cooler thermostat were located in the south end of the room and therefore did not measure a representative room temperature. The inspectors reviewed the design of the room cooler to evaluate the impact of the temperature difference on the operability of the Unit 1 West MDAFWP. Because the auxiliary feedwater system was relied upon to support secondary heat removal following a loss of normal feedwater, the inspectors determined that this inspection was associated with the Mitigating Systems cornerstone.

b. Findings

No findings of significance were identified.

.3 Impact of Turbine Building High Energy Line Break on Operability of Diesel Generator Fuel Oil Transfer Pumps

a. Inspection Scope

On January 29, 2001, the licensee identified that the diesel generator fuel oil pump transfer rooms were potentially vulnerable to the effects of a high energy line break (HELB) in the turbine building. The licensee evaluated the condition and determined that, although a HELB could result in fuel oil pump room temperatures above environmental qualification limits, the equipment located within the room would remain functional following postulated HELB event. Therefore, the licensee concluded that this condition represented an operable but non-conforming item. The inspectors reviewed the licensee's operability evaluation and supporting documentation to assess the basis and quality for the operability determination. Because failure of the fuel oil transfer pumps could result in loss of the emergency diesel generators, the inspectors concluded that this inspection was associated with the Mitigating Systems cornerstone.

b. Findings

No findings of significance were identified.

1R16 Operator Workarounds (71111.16)

.1 Review of the Cumulative Effect of Operator Workarounds (Both Units)

a. Inspection Scope

The inspectors reviewed the cumulative effect of Operator Workarounds (OWAs) on equipment availability, initiating event frequency, and the ability of the operators to implement abnormal or emergency operating procedures. As part of this inspection, the inspectors interviewed the OWA Coordinator regarding the oversight and control of OWAs.

b. Issues and Findings

No findings of significance were identified.

1R19 Post Maintenance Testing (71111.19)

a. Inspection Scope

The inspectors reviewed the post maintenance testing requirements associated with the following scheduled maintenance activities:

Mitigating Systems Cornerstone

- Unit 2 Plant Air Compressor Strainer Outlet Valve Replacement
- Unit 2 Temperature Switch Replacement on CRID Ventilation Fans

- Troubleshooting and Repair of Unit 2 Switchgear Ventilation Fan 2-HV-SGRS-9 and Suction Damper

Barrier Integrity Cornerstone

- Unit 1 Train "A" SSPS Power Supply Replacement

The inspectors reviewed post maintenance testing criteria specified in the applicable preventive and corrective maintenance work orders. The inspectors verified that test methodology and acceptance criteria were appropriate for the scope of work performed. Documented test data was reviewed to verify that the testing was complete and that the equipment was able to perform the intended safety functions.

b. Findings

No findings of significance were identified. During the review of post maintenance testing for the troubleshooting and repair of 2-HV-SGRS-9, the inspectors identified issues associated with the problem identification and resolution cross-cutting area. These issues are discussed in greater detail in Section 4OA2 below.

1R22 Surveillance Testing (71111.22)

a. Inspection Scope

The inspectors observed portions of the following surveillance tests to verify that testing was conducted in accordance with applicable procedural and TS requirements:

Mitigating Systems Cornerstone

- Unit 2 West Motor Driven Auxiliary Feedwater Pump System Test
- Unit 2 Turbine Driven Auxiliary Feedwater System Test
- Unit 1 Train "A" Emergency Diesel Generator Slow Speed Start

Barrier Integrity Cornerstone

- Unit 2 Plant Process Computer Derived Thermal Power Evaluation
- Fuel Handling Area Exhaust Ventilation System Test

The inspectors reviewed the test methodology and test results in order to verify that equipment performance was consistent with safety analysis and design basis assumptions.

b. Findings

No findings of significance were identified.

1R23 Temporary Modifications

a. Inspection Scope

The inspectors reviewed the following risk-significant temporary modifications:

Mitigating Systems Cornerstone

- Install Water Splash Shield on the Unit 1 and Unit 2 Auxiliary Feedwater Pumps

Barrier Integrity Cornerstone

- Temporary Modification 2-TM-01-016-RO, "On-Line Leak Repair of 2-MPP-231-V1, SG-3 Channel 2 Steam Pressure Transmitter 2-MPP-231 Root Valve"

The inspectors reviewed the temporary modification (TM) and associated 10 CFR 50.59 screening against the system design bases documentation, including the Updated Final Safety Analysis Report and the TSs. In addition, the inspectors verified that the TM was installed in accordance with the required documentation and that configuration control was maintained.

b. Findings

No findings of significance were identified.

Cornerstone: Emergency Preparedness

1EP6 Drill Evaluation (71114.06)

.1 July 11, 2001 Emergency Planning Drill

a. Inspection Scope

On July 11, 2001, the licensee performed an emergency planning (EP) drill. Prior to the drill, the licensee determined that the results of the drill would be included in the development of performance indicators for drill/exercise participation and emergency response organization participation. The drill scenario involved a steam generator tube leak and main steam line rupture which led to high radiation levels in the turbine building and an off-site release.

The inspectors reviewed the drill scenario, observed the drill performance from the simulator and the Operations Support Center, and attended the post-drill critique meetings.

b. Issues and Findings

There were no findings identified and documented during this inspection.

.2 (Closed) Inspection Followup Item 50-315/316/99030-02: The untimely dispatch of OSA teams. On July 11, 2001, the inspectors observed an Emergency Planning drill conducted by the licensee. This drill involved staffing the Operations Support Center (formerly called the Operations Staging Area), establishing communications with the Technical Support Center and the Control Room, and briefing and dispatching teams. The inspectors concluded that the Operations Support Center staff adequately prioritized and dispatched teams in accordance with the priorities established by the Control Room and Technical Support Center. This Inspection Followup Item is closed.

4. OTHER ACTIVITIES (OA)

4OA1 Performance Indicator Verification (71151)

a. Inspection Scope

The inspectors reviewed the licensee's gathering and submittal of data for the following, first and second quarter of 2001, information:

- Unit 1 Scrams with Loss of Normal Heat Sink
- Unit 1 Safety System Functional Failures

b. Findings

No findings of significance were identified.

4OA2 Identification and Resolution of Problems

a. Inspection Scope

During the course of routine inspection activities, the inspectors identified multiple findings related to the effectiveness of the licensee's corrective action program. These findings, described in Sections 1R01 and 1R15.1 above, were associated with the licensee's failure to adequately resolve conditions adverse to quality. The inspectors assessed these findings relative to the problem identification and resolution cross-cutting area.

b. Findings

The inspectors identified several examples of weak licensee performance in the problem identification and resolution cross-cutting area. The following examples indicate a potential adverse performance trend in problem identification and resolution:

- As discussed in Section 1R01 above, the licensee failed to promptly correct an identified condition adverse to quality, degraded operation of the Unit 2 CRID ventilation system. The inspectors concluded that the licensee's failure to properly evaluate and correct this degraded condition constituted a Non-Cited Violation of 10 CFR 50, Appendix B, Criterion XVI **(NCV 50-316/01-14-01**).

- As discussed in Section 1R15.1 above, the licensee failed to take corrective actions to prevent repetitive occurrences of water intrusion into the Unit 1 West MDAFWP bearing housing. The inspectors concluded that this failure constituted a Non-Cited Violation of 10 CFR 50, Appendix B, Criterion XVI **(NCV 315/01-14-02).**

- During a review of completed PMT activities described in Section 1R19 above, the inspectors identified that the licensee did not adequately identify and resolve a condition adverse to quality associated with 2-HV-SGRS-9, the 600 VAC motor control center mezzanine area ventilation supply fan. Specifically, CR 01207001 identified that on July 26, 2001, after fan 2-HV-SGRS-9 was placed into service, no air flow was present and the associated fan suction damper did not open. Following completion of troubleshooting activities, the licensee declared the fan operable on July 27. The inspectors identified several deficiencies associated with the identification and resolution of this issue, including: (1) the original problem identification lacked sufficient detail to clearly identify the deficient condition, (2) the troubleshooting activities failed to identify the cause of the failure and the troubleshooting scope failed to verify proper operation of all the components that could have reasonably caused the observed failure, and (3) the troubleshooting and PMT did not evaluate the impact of fan operation with the suction damper closed.

  Based on the inspectors questions, the licensee initiated CR 01215021 to document that the degraded condition of 2-HV-SGRS-9 was initially poorly documented and resolved. The licensee also initiated CR 01215020 to perform further investigation of the condition of fan 2-HV-SGRS-9. During this follow up investigation, the licensee identified that fan motor characterization testing potentially indicated degradation of fan 2-HV-SGRS-9. The licensee evaluated the operability of 2-HV-SGRS-9 and determined that, with the addition of compensatory measures, reasonable assurance of functionality existed. The inspectors concluded that, although the fan was potentially degraded, the licensee's operability conclusion was reasonable. 10 CFR 50, Appendix B, criterion XVI requires, in part, that conditions adverse to quality are promptly identified and corrected; however, the inspectors determined that it constitutes a violation of minor significance that is not subject to enforcement action in accordance with Section IV of the NRC's Enforcement Policy. Although this issue was of minor significance, the inspectors determined it provided substantive information regarding the problem identification and resolution cross cutting issue.

The inspectors determined that the failure to adequately identify and resolve degraded conditions for the auxiliary feedwater and safety-related ventilation systems could have a credible impact on safety if left uncorrected. Although the inspectors determined that licensee performance weaknesses in the problem identification and resolution area does not impact a specific reactor safety cornerstone, these issues provide substantive information relating to the problem identification and resolution cross-cutting area and relate to previously identified findings. Because of this extenuating circumstance, the

inspectors concluded that these corrective action program weaknesses constituted a **NO-COLOR Finding (FIN 50-315/01-14-03; 50-316/01-14-03)**.

4OA6 Management Meetings

The inspectors presented the inspection results to licensee management listed below on August 21, 2001. The licensee acknowledged the findings presented. No proprietary information was identified.

KEY POINTS OF CONTACT

Licensee

C. Bakken, Site Vice President
R. Gaston, Regulatory Affairs Manager
J. Gebbie, System Engineering Manager
S. Greenlee, Director, Design Engineering and Regulatory Affairs
S. Lacey, Director, Plant Engineering
E. Larson, Manager, Operations
R. Meister, Regulatory Affairs
T. Noonan, Director, Performance Assurance
J. Pollock, Plant Manager
R. Powers, Senior Vice President
M. Rencheck, Vice President, Nuclear Engineering

NRC

A. Vegel, Chief, Reactor Projects Branch 6

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

50-316/01-14-01	NCV	Failure to Correct Condition Adverse to Quality on the Unit 2 CRID Ventilation System
50-315/01-14-02	NCV	Failure to Prevent Implement Corrective Actions to Prevent Recurrence of Water Intrusion into AFW Pump Bearing Oil
50-315/01-14-03 50-316/01-14-03	FIN	Problem Identification and Resolution Weaknesses

Closed

50-315/99030-02 50-316/99030-02	IFI	The untimely dispatch of OSA teams
50-316/01-14-01	NCV	Failure to Correct Condition Adverse to Quality on the Unit 2 CRID Ventilation System
50-315/01-14-02	NCV	Failure to Prevent Implement Corrective Actions to Prevent Recurrence of Water Intrusion into AFW Pump Bearing Oil
50-315/01-14-03 50-316/01-14-03	FIN	Problem Identification and Resolution Weaknesses

Discussed

None

LIST OF ACRONYMS USED

AEP	American Electric Power
AFW	Auxiliary Feedwater System
AFX	Spent Fuel Pool Ventilation System
ATR	Administrative Technical Requirement
CDF	Core Damage Frequency
CEQ	Hydrogen Skimmer System
CFR	Code of Federal Regulations
CR	Condition Report
CRID	Control Room Instrument Distribution
DRP	Division of Reactor Projects
EP	Emergency Preparedness
ESW	Essential Service Water
FIN	Finding
HELB	High Energy Line Break
IMC	Inspection Manual Chapter
LERF	Large Early Release Frequency
MDAFWP	Motor Driven Auxiliary Feedwater Pump
ml	Milliliters
MS	Main Steam
NESW	Non-Essential Service Water
NRC	Nuclear Regulatory Commission
NRR	Nuclear Reactor Regulation
OA	Other Activities
OHP	Operations Head Procedure
ORW	Operating Reserve Warning
OWA	Operator Workaround
PDR	Public Document Room
PI	Performance Indicator
PMP	Plant Manager's Procedure
PMT	Post-maintenance Testing
PPC	Plant Process Computer
ppm	parts per million
RHR	Residual Heat Removal
SDP	Significance Determination Process
SRO	Senior Reactor Operator
SSC	Structures, Systems, and Components
SSPS	Solid State Protection System
STP	Surveillance Test Procedure
TDAFWP	Turbine Driven Auxiliary Feedwater Pump
TS	Technical Specification
UHS	Ultimate Heat Sink
URI	Unresolved Item
UFSAR	Updated Final Safety Analysis Report
VAC	Volts, Alternating Current
VIO	Violation

LIST OF DOCUMENTS REVIEWED

1R01 Adverse Weather

12-OHP 4022.001.010	Severe Weather	Revision 0
02-OHP 4024.204	Annunciator #204 Response: Essential Service Water and Component Cooling	Revision 8
PMP 2080.SWM.001	Severe Weather Guidelines	Revision 0
PMP 2080.EPP.111	Natural Emergency Guidelines	Revision 1
PMP 4030.001.001	Impact of Safety Related Ventilation on the Operability of Technical Specification Equipment	Revision 4
	Unit 2 Control Room Logs	April 7, 2001 through July 31, 2001
CR 99-10357	Fans 2-HV-SGRS-1A and 2-HV-SGRS-4A in the 4kV room, which share common duct work, are experiencing adverse fan to fan interaction	May 3, 1999
CR 00-10696	Guidance in 12-PMP 4030.001.001 has not been satisfactorily implemented in annunciator response procedures	July 31, 2000
CR 01097014	2-HV-SGRS-1A was causing the outlet damper for 2-HV-SGRS-4A to cycle open and closed with 2-HV-SGRS-4A in operation	April 7, 2001
CR 01196002	ODE actions specified in CR 99-10357 to restore full qualification for CRD/CRID ventilation fans appear to have been inadequately implemented	July 14, 2001
CR 01210001	4kV switchgear fans 2-HV-SGRS-1A and 2-HV-SGRS-4A dampers are cycling causing ventilation problems in the CRID inverter room area	July 29, 2001
CR 01208059	NRC identified that 4kV room intake ventilation hood 2-HV-SGR-GH-3B was dirty	July 27, 2001

	Control Room Logs	April 1, 2001 through July 31, 2001
CR 99-10357	Fans 2-HV-SGRS-1A and 2-HV-SGRS-4A are experiencing adverse fan to fan interactions	May 3, 1999
CR 01097014	2-HV-SGRS-1A was causing the outlet damper for 2-HV-SGRS-4A to cycle open and closed with 2-HV-SGRS-4A in operation	April 7, 2001
CR 01196002	ODE actions specified in CR 99-10357 to restore full qualification for CRD/CRID ventilation fans appear to have been inadequately implemented	July 14, 2001
JO 01191029	2-VTS-351, Replace/calibrate temperature switch	August 4, 2001
JO 01191032	2-VTS-350, Replace/calibrate temperature switch	August 4, 2001
CR 01210001	4kV switchgear fans 2-HV-SGRS-1A and 2-HV-SGRS-4A dampers are cycling causing ventilation problems in the CRID inverter room area	July 29, 2001
CR 01208058	NRC identified that 4kV room intake ventilation hood 2-HV-SGR-GH-2B was dirty	July 27, 2001

1R04 Equipment Alignment

Unit 1 Non-Essential Service Water System

UFSAR Section 9.8.3	Service Water Systems	
01-OHP 4021.020.001	Filling and Venting of Non-Essential Service Water System	Revision 9a
Flow Diagram OP-1-5114	Non-Essential Service Water Unit 1	

Unit 2 Train “B” emergency diesel generator

02-OHP 4021.032.008AB	Operating DG2AB Subsystem	Revision 1
Flow Diagram OP-2-5151	Emergency Diesel Generator “AB” Unit 2	

Unit 1 Auxiliary Feedwater System

Drawing OP-1-5106A	Flow Diagram Aux Feedwater Unit 1	

Unit 2 Emergency Core Cooling System

Drawing OP-2-5142	Flow Diagram Emerg. Core Cooling (SIS)	
Drawing OP-2-5143	Flow Diagram Emerg. Core Cooling (RHR)	

1R05 Fire Protection

UFSAR Section 9.8.1	Fire Protection System	
	D. C. Cook Nuclear Plant Fire Hazards Analysis, Units 1 and 2	Revision 8
	D. C. Cook Nuclear Plant Units 1 and 2 Probabilistic Risk Assessment, Fire Analysis Notebook	February 1995
ATR 1-FP-1	Unit 1 Fire Detection	
PMP 2270.CCM.001	Control of Combustible Materials	Revision 0
PMP 2270.FIRE.002	Responsibilities for Cook Plant Fire Protection Program Document Updates	Revision 0
PMP 2270.WBG.001	Welding, Burning and Grinding Activities	Revision 0
PMI 2270	Fire Protection	Revision 26
CR 01215051	Flammable materials improperly stored in Unit 2 miscellaneous oil storage room	August 5, 2001
CR 01217009	Combustible materials improperly stored under insulation work benches	August 7, 2001

1R11 Licensed Operator Requalification

02-OHP 4023.E-0	Reactor Trip or Safety Injection	Revision 16b
02-OHP 4023.E-1	Loss of Reactor or Secondary Coolant	Revision 10
02-OHP 4023.ES-1.2	Post LOCA Cooldown and Depressurization	Revision 5c

02-OHP 4023.ECA-1.1	Loss of Emergency Coolant Recirculation	Revision 8
Requalification Training RQ-S-2641	ECA 1.1 Loss of Emergency Recirculation	Revision 0

1R12 Maintenance Rule Implementation

.1 Non-Essential Service Water System

	Non-Essential Service Water System Maintenance Rule Scoping Document	March 27, 2001
UFSAR Section 9.8.3	Service Water Systems	
AR 161388	Replace motor on Unit 1 North NESW pump	April 30, 1998
CR 00355020	Documentation of historic review of WR/JOs and Operations logs for their impact on NESW system Maintenance Rule functions	December 20, 2000
CR 01014007	The Unit 2 South NESW pump motor breaker opened 10 seconds after pump start	January 14, 2001
CR 01066013	Non-essential service water function NSW-02 is monitored in the Maintenance Rule at the plant level, whereas the Probabilistic Risk Assessment models this function at the train level	March 7, 2001
CR01144047	A review of eCAPs generated since December 1, 2000 was reviewed to identify any missed Maintenance Rule evaluations	May 24, 2001
CR 01198001	Unit 2 North NESW pump breaker tripped open with no alarms in the control room	July 16, 2001
CR 01207065	Failure rates of NESW pump motors over the past three years appear to be exceeding the failure rates of the NESW pumps assumed in the Probabilistic Risk Analysis	July 26, 2001

CR 01066013	Non-essential service water function NSW-02 is monitored in the Maintenance Rule at the plant level, whereas the Probabilistic Risk Assessment models this function at the train level	March 7, 2001
CR 01208055	The NESW and flow indication lines for Containment and Instrument Room Ventilation continually clog with lake debris and sand.	July 27, 2001
CR 01208065	Perceived lack of effective preventive actions due to repetitive oil seal and shaft seal leaks on NESW pumps	July 27, 2001

.2 Air Recirculation/Hydrogen Skimmer System

	Air Recirculation/Hydrogen Skimmer System Maintenance Rule Scoping Document	May 3, 2001
UFSAR Section 5.5	Containment Ventilation System	
CR 00354086	Maintenance Rule evaluation for the air recirculation/hydrogen skimmer system	December 19, 2001
CR 01151034	Previous Maintenance Rule reliability and unavailability reviews may not have been inclusive of revised scoping document requirements	May 31, 2001

.3 Main Steam System

CR 01215041	NRC identified that unavailability performance criterion for main steam dump valves may have been exceeded during the June 2000 Unit 2 startup	August 3, 2001
	Maintenance Rule historical assessment for the Main Steam system	July 20 ,2001
	Unit 1 and Unit 2 Control Room Logs	
CR 00321097	The as found testing for main steam safety valve 1-SV-2A-2 was unsatisfactory	November 15, 2000

CR 00348015	Steam Generator Snubber valve block fitting missing o-ring	December 11, 2000
CR 00-10192	Main steam isolation components have experienced repetitive failures	July 19, 2000
CR 00300022	1-XSO-212 either leaks by or is stuck in mid-position	October 26, 2000
CR 00298042	1-XSO-222 leaks by with power removed	October 24, 2000

.4 Residual Heat Removal System

	Emergency Core Cooling and Residual Heat Removal System Maintenance Rule Scoping Document	April 27, 2001
	Emergency Core Cooling and Residual Heat Removal System Health Report	April 1, 2001 through June 30, 2001
CR 00301073	1-IMO-263 interlock with 1-IMO-340 failed	October 27, 2000
CR 00301061	1-IMO-340 Failed to open during performance of 1-EHP.SP.150	October 27, 2000
CR 00298081	1-IMO-128 failed to hold pressure during seat leakage testing	October 24, 2000
CR 00301081	1-IMO-320 failed to open during testing due to incorrect jumper installation	October 27, 2000
CR 00-8237	Minimum requirements for residual heat removal loop operability not met during testing	June 7, 2000
CR 01227032	NRC identified that the Maintenance Rule Scoping document for the residual heat removal and emergency core cooling systems would not identify all potential MR functional failures	August 15, 2001

.5 Spent Fuel Storage Pool Exhaust Ventilation System

OP-12-5148-61	Flow Diagram Auxiliary Building Ventilation	Revision 61

CR P-17063	Acceptance criteria for filter maximum allowable pressure is not consistent with calculations	June 28, 1999
CR P-99-23012	AFX HEPA filter high differential pressure	September 14, 1999
Maintenance Rule Scoping Document	Auxiliary Building Spent Fuel Pool Ventilation System	Revision 3
UFSAR 9.9.3.2	Fuel Handling Area Ventilation System	Revision 17
DCC HV-12-FH-01S	D. C. Cook Ventilation Calculation for the fuel handling area system pressure drop	December 20, 1989
DIT-B-00522-00	Allowable pressure drops across charcoal HEPA units	December 10, 1999
TS 3.9.12	Technical Specification requirements for the spent fuel pool ventilation system	
12-OHP 4021.028.011	Normal operating procedure for the Auxiliary Building ventilation systems	Revision 11
01-OHP 5030.001.001	Unit 1 Operations Plant Tours	Revision 18
12-OHP 4030.STP.028	Fuel handling area exhaust ventilation system test	Revision 13
12-IHP 4030.STP.058	Spent fuel pool area monitor (R-5) surveillance test	Revision 7
CR P-99-15304	Discrepancies in fuel handling area exhaust filter unit surveillance procedure	June 12, 1999
CR P-00-07719	Spent Fuel Pool exhaust ventilation HEPA filter differential pressure is high	May 28, 2000
CR P-00-07854	Calibrations overdue for the HEPA and charcoal filter differential pressure indicators	May 30, 2000

CR P-00-11175	Operating Experience - Control Room filtration inoperable due to testing method	August 10, 2000
CR 01227041	NRC Identified that a MPFF was missed during the review of CR P-99-23012.	August 15, 2001
UFSAR 9.9.3.2	Fuel Handling Area Ventilation System	Revision 17

.6 Ultimate Heat Sink

UFSAR 9.8.3	Service Water Systems	Revision 17
UFSAR 10.6	Circulating Water Systems	Revision 17
TS 3.7.4.1	Essential Service Water System	
	Maintenance Rule Scoping Document Screenwash/Ultimate Heat Sink	Revision 2

1R13 Maintenance and Emergent Work Control

Unit 2 North NESW Pump Motor Replacement

12-OHP 4021.020.002	Operation of the NESW System	Revision 3
02-OHP 4022.020.001	NESW System Loss/Rupture	Revision 3
12-IHP 5021.IMP.001	Lead Lifting/Landing and Electrical Jumper/Fuse Installation and Removal	Revision 3
12-IHP 5021.EMP.021	Cable Termination and Splicing	Revision 3
PMP 2291.OLR.001	On-Line Risk Management	Revision 1
AR 161388	Replace motor on Unit 1 North NESW pump	April 30, 1998
CR 01014007	The Unit 2 South NESW pump motor breaker opened 10 seconds after pump start	January 14, 2001

CR 01198001	Unit 2 North NESW pump breaker tripped open with no alarms in the control room	July 16, 2001
CR 01198005	Unit 1 North NESW pump inboard bearing is losing oil at approximately 4 ounces over a 30 minute period	July 16, 2001
JO 01198001	Replace Unit 2 North NESW pump motor	July 17, 2001
Clearance 2012037		July 17, 2001

Lubricate and clean Unit 1 East Component Cooling Water Pump

PMP 2291.OLR.001	On-Line Risk Management	Revision 1
PMP 2291.OLR.001 Data Sheet 1, Work Week Cycle 37, W-10	Work Schedule Review and Approval Form, July 8 - 14, 2001	July 6, 2001
CR 01192040	Unable to complete maintenance on relief valve 1-SV-15E due to excessive boundary valve leakage. The boundary valve leakage was previously existed but was not identified during work package preparation.	July 11, 2001
CR 01192046	Maintenance support was not available to install test gages for CCW pump surveillance. This caused a one hour delay in returning the CCW pump to an operable status	July 11, 2001
CR 01193015	NRC identified that operations declared the East CCW operable prior to completing required post maintenance testing	July 12, 2001
	Unit 1 Control Room Logs	July 11, 2001

Unit 1 West Essential Service Water Pump Oil Change and Relay Calibration

PMP 2291.OLR.001 Data Sheet 1, Work Week Cycle 37, W-12	Work Schedule Review and Approval Form, July 22 - 28, 2001	July 19, 2001

CR 01206052	NRC identified that non-seismic scaffolding was installed over a safety-related cable tray in the Unit 1 West Feedwater Regulating valve area	July 25, 2001

Degraded Offsite Voltage During Unit 2 Turbine Driven Auxiliary Feedwater Pump Maintenance

PMP 2291.OLR.001 Data Sheet 1, Work Week Cycle 38, W-2	Work Schedule Review and Approval Form, August 5 - 11, 2001	July 24, 2001
CR 01223011	Management did not re-evaluate the removal of the Unit 2 TDAFP from service when plant/grid conditions were changing	August 11, 2001
CR 01221050	Offsite power load flow program indicated voltage level less than the operability limit	August 9, 2001
	Shift Manager & Control Room Logs (Unit 1 & 2)	August 8 - 10, 2001
I&M to NRC Letter dated May 4, 2000	Short Term and Planned Long Term Enhancements to the Electrical Distribution System (TAC Nos. MA6799 and MA6800)	May 4, 2000
PMP 2291.EXE.001	Work Management Activity Execution Process	Revision 3
Standing Order SO-2001-0002	Potential Consequence Review For Overall Plant Impact	August 17, 2001

Unit 1 Train “A” Solid State Protection System Power Supply Replacement

12-IHP 6030.IMP.019	Solid State Protection System Logic Cabinet 15 and 48 Volt Power Supply	Revision 0
JO 01206007	Investigate/replace failed power supply on 1-RPS-A with new power supply	July 27, 2001
Dedication Plan PS-0084	Power Supply 48/15 VDC	July 20, 2001
CR 01194058	Received annunciator 110 drop 49, Reactor Protection Train “A” Trouble, alarm unexpectedly	July 13, 2001

CR 01206007	Reactor Protection Train "A" trouble alarm received due to failure of 48 VDC power supply	July 25, 2001

1R14 Personnel Performance During Nonroutine Evolutions (71111.14)

.1 Unit 1 Power Reduction to Mode 2 (Reactor Startup)

CR 01186007	NRC identified that the #13 circulating water pumps amps are swinging rapidly in a narrow band between 350 and 360 amps	July 4, 2001
CR 01186002	Repeated concerns with water contamination of auxiliary feedwater pump bearing oil requires remedial action	July 5, 2001
CR 01183042	NRC identified that the Unit 1, feedwater heater 6A drain line was experiencing water hammer	July 2, 2001
CR 01183041	NRC identified that the Unit 1 East MDAFW pump test valve has a packing leak of approximately 2 gallons per minute	July 2, 2001
CR 01186018	Corrective actions for CR 01050013, associated with recommended procedure changes for steam plant warmup, were not effectively implemented	July 5, 2001
CR 01184059	Unit 1 steam dump valves 1-URV-110 and 1-URV-120 leaked by the closed seat	July 3, 2001
CR 01183039	NRC Identified that the Unit 1 West Motor Driven Auxiliary Feedwater pump packing was spraying water on the outboard bearing	July 2, 2001
CR 01184081	Unit 1 West MDAFWP alarmistat and thermostat are located near the room cooler outlet	July 3, 2001

1R15 Operability Evaluations

.1 Water Contamination of the Unit 1 West Motor Driven Auxiliary Feedwater Pump Bearing Oil

12-EHP 5030.OIL.001	Oil Analysis Program	Revision 1
Unit 1 Control Room Log	July 2 - 4, 2001	
Vendor Technical Manual VTM-INDR-0002	Ingersoll Dresser (Formerly Ingersoll Rand) Auxiliary Feedwater Pumps	Revision 4
Letter AEP:NRC 1184F	NRC Inspection Reports No. 50-315/93016 (DRP) and 50-316/93016 (DRP) Reply to Notice of Violation	September 16, 1993
Letter AEP:NRC:11844F1	Revised Commitments Regarding Lube Oil Sampling and Analysis Program and Actions to be Taken if Oil Analysis Indicates Possible Degradation	November 11, 2994
CR 98-8317	Packing leak discovered at outboard pump packing on Unit 1 West motor driven auxiliary feedwater pump	December 22, 1998
CR 99-21501	Evaluate moisture intrusion into auxiliary feedwater pumps	August 26, 1999
CR 99-1907	NRC Inspection Report 96-13 Unresolved Item 96013-05 identified the need to initiate a root cause evaluation for particulate oil contamination in all six auxiliary feedwater pumps	January 30, 1999
CR 98-7665	The Unit 1 East motor driven auxiliary feedwater pump bearing is degraded	December 4, 1998
CR 00348124	The Unit 1 West motor driven auxiliary feedwater pump outboard pump packing is leaking a fine spray	December 13, 2000
CR 01032008	Water was found in the oil from the Unit 1 West motor driven auxiliary feedwater pump outboard bearing	February 1, 2001
CR 01183039	NRC identified that a packing leak on the Unit 1 West motor driven auxiliary feedwater pump was spraying on the bearing housing	July 2, 2001
CR 01184086	The Unit 1 West motor driven auxiliary feedwater outboard bearing housing was water contamination	July 3, 2001

CR 01186002	Evaluate repeated concerns with auxiliary feedwater pump bearing housing water contamination requires remedial action	July 5, 2001

.2 Operability of the West Auxiliary Feedwater Room Cooler

CR 01207019	NRC identified potential non-conformance with UFSAR description of AFW pump room cooler operation	July 26, 2001
CR 01184081	NRC questioned acceptability of placing the AFW room cooler thermostat and temperature alarm switch in close proximity to room cooler outlet	July 3, 2001
CR 01048002	Unit 1 West AFW pump room temperatures exceeded notification limit	February 17, 2001
CR 00348077	Location of Unit 1 West motor driven AFW pump room cooler temperature control switch results in an operator workaround	December 13, 2000
CR 00-9021	Unit 2 West motor driven AFW pump room cooler is not properly regulating room temperatures	June 21, 2000
Design Change Package 1-DCP-4595	Modification of Auxiliary Feedwater Pump Rooms Ventilation System	Revision 0
UFSAR Section 14.4	AFW Pump Room Protection	
Calculation TH-00-05	Auxiliary Feedwater Pump Room Heat-Up Temperature	Revision 0

.3 Impact of Turbine Building High Energy Line Break on Operability of Diesel Generator Fuel Oil Transfer Pumps

CR 01030003	Dampers 1(2)-HV-DOD-1 represent a high energy line break concern for the diesel fuel oil transfer pump rooms. The dampers may not close during a postulated HELB.	January 29, 2001
Calculation TH-95-01	Turbine Building - GOTHIC Model	Revision 3
UFSAR 14.4	Environmental Qualification Analyses	

CR 00-1334	Tracking condition report to revise high energy line break calculations following completion of design basis lake temperature change	January 24, 2000
Calculation TH-01-04	HELB in Diesel Fuel Oil Transfer Pump Room	Revision 0
PMP 4030.001.002	Administrative Requirements for Ventilation Boundary and High Energy Line Break Barriers	Revision 5

1R16 Operator Workarounds

Review of the Cumulative Effect of Operator Workarounds (Both Units)

PMP 4010.OWA.001	Oversight and Control of Operator Workarounds	Revision 1
	Workaround list for Unit 1 and common	August 2001
	Workaround list for Unit 2 and common	August 2001

1R19 Post Maintenance Testing

Unit 2 Plant Air Compressor Strainer Outlet Valve Replacement

UFSAR Section 9.8.2	Compressed Air System	
12-MHP 5021.001.142	Norris Butterfly Valve Maintenance	Revision 0
2-OHP 4021.064.001	Operation of Plant and Control Air Systems	Revision 11
PMP 2291.PMT.001	Work Management Post Maintenance Testing Matrices	Revision 2
WR A185234	2-NSW-120 is leaking by	June 14, 1999
AR 01193051	While attempting to isolate 2-STN-7N for clearance, 2-NSW-120 valve handle would not reach the last notched position	July 12, 2001
JO C54688	2-NSW-120, disassemble, repair leak by	July 18, 2001
JO R218355	Plant air compressor functional test	July 19, 2001

Unit 2 Temperature Switch Replacement on Switchgear Ventilation Fans

	Unit 2 Control Room logs	April 7, 2001 through August 5, 2001
AR 01121034	Calibrate temperature switch 2-VTS-350	May 1, 2001
AR 01121037	Calibrate temperature switch 2-VTS-351	May 1, 2001
JO 01191029	2-VTS-351, Replace/calibrate temperature switch	August 4, 2001
JO 01191032	2-VTS-350, Replace/calibrate temperature switch	August 4, 2001
CR 99-10357	Fans 2-HV-SGRS-1A and 2-HV-SGRS-4A are experiencing adverse fan to fan interactions	May 3, 1999
CR 01097014	2-HV-SGRS-1A was causing the outlet damper for 2-HV-SGRS-4A to cycle open and closed with 2-HV-SGRS-4A in operation	April 7, 2001
CR 01191029	Replace temperature switch 2-VTS-351 and calibrate new switch	July 10, 2001
CR 01191032	Replace temperature switch 2-VTS-350 and calibrate new switch	July 10, 2001
CR 01219064	4kV switchgear room fans 2-HV-SGRS-1A and 2-HV-SGRS-4A operate in a fashion that results in the associated inlet and recirc dampers to cycle excessively	August 7, 2001

Troubleshooting and Repair of 2-HV-SGRS-9 Fan and Suction Damper

CR 01215021	NRC identified poor quality ESAT creation, documentation of 2-HV-SGRS-9 troubleshooting and post maintenance testing	August 3, 2001
CR 01215020	NRC identified that troubleshooting performed on 2-HV-SGRS-9 fan per CR 01207001 failed to adequately evaluate possible damage to fan motor and associated damper operator	August 3, 2001

CR 01207001	After switchgear fan 2-HV-SGRS-9 was placed into service, no air flow was present and the associated damper did not open	July 26, 2001
CR 01230008	Motor characterization test results indicate an inductance imbalance on fan 2-HV-SGRS-9	August 18, 2001
	Unit 2 Control Room Logs	July 26, 2001
JO 01207001	Investigate 2-HV-SGRS-9 circuit, controls. Investigate for low air flow/hot smell	
Drawing No. 2-98741	Elementary Diagram Auxiliary Building Ventilation Sheet No.1	Revision 31
Drawing OP-2-5148C	Flow Diagram Diesel Generator Area and Electrical Switchboard Rooms Heating and Ventilation System Unit 2	Revision 16

Unit 1 Train “A” SSPS Power Supply Replacement

01-IHP 4030.STP.410	Train “A” RPS and ESF Reactor Trip Breaker and SSPS Automatic Trip/Actuation Logic Functional Test	Revision 5
PMP 2291.PMT.001	Work Management Post Maintenance Testing Matrices	Revision 2
JO 01206007	Investigate/replace failed power supply	July 27, 2001
CR 01206007	Annunciator 110 drop 49 (Reactor Protection Train "A" Trouble) alarm came in due to failed 48 VDC power supply	July 25, 2001

1R22 Surveillance Testing

Unit 2 West Motor Driven Auxiliary Feedwater Pump System Test

02-OHP 4030.STP.17W	West Motor Driven Auxiliary Feedwater System Test	Revision 11

CR 01208048	NRC questioned if the practice pf sampling pump bearing lube oil with the pump in automatic could potentially result in a foreign material or personnel safety hazard	July 27, 2001
DIT B-00759	Design Basis Performance Parameters for the Motor-Driven Auxiliary Feedwater Pumps	Revision 1
CR 01207054	Precaution 3.4 of 2-OHP 4030.STP.017W may not have been complied with during testing in that the AEO left the pump room with test gages unisolated	July 26, 2001

Unit 2 Turbine Driven Auxiliary Feedwater System Test

TS 3.7.1.2	Auxiliary Feedwater System	
02-OHP 4030.STP.017T	Turbine Driven Auxiliary Feedwater System Test	Revision 15
02-OHP 4030.STP.017TV	Turbine Driven Auxiliary Feed Pump Trip and Throttle Valve Operability Test	Revision 9a
JO 01222001	Investigate/repair Unit 2 TDAFP failure to start	August 11, 2001
CR 01222001	While performing the fill and vent procedure for the Unit 2 TDAFP the pump failed to start on two consecutive attempts	August 10, 2001

Unit 1 Train “A” Emergency Diesel Generator Slow Speed Start

TS 4.8.1	AC Power Sources - Operating	
01-OHP 4021.032.008CD	Operating DG1CD Subsystem	Revision 1
01-OHP 4030.STP.027CD	CD Diesel Generator Operability Test (Train "A")	Revision 16
JO R218889	Unit 1 CD diesel generator slow speed start	August 4, 2001

CR 01216063	During the Unit 1 CD diesel generator surveillance, the NRC inspector raised a concern about 1-SV-139-CD exhaust piping	August 4, 2001

Unit 2 PPC Derived Thermal Power Evaluation

TS 2.2	Limiting Safety System Settings	
TS 4.3.1.1	Reactor Trip System Instrumentation	
02-OHP 4030.STP.029	Reactor Thermal Power	Revision 15

Fuel Handling Area Exhaust Ventilation System Test, (July 22, 2001).

12-OHP 4030.STP.028	Fuel handling area exhaust ventilation system test	Revision 13
TS 3.9.12	Technical Specification requirements for the spent fuel pool ventilation system	
OP-12-5148-61	Flow Diagram Auxiliary Building Ventilation	Revision 61

1R23 Temporary Modifications

Install Water Splash Shield on the Unit 1 and Unit 2 Auxiliary Feedwater Pumps

Temporary Modification 12-TM-01-23-R0	Install water splash shields on the Unit1 and Unit 2 Auxiliary Feedwater Pumps	Revision 0

Temporary Modification 2-TM-01-016-RO, "On-Line Leak Repair of 2-MPP-231-V1, SG-3 Channel 2 Steam Pressure Transmitter 2-MPP-231 Root Valve"

Temporary Modification 2-TM-01-016-RO	On-Line Leak Repair of 2-MPP-231-V1, SG-3 Channel 2 Steam Pressure Transmitter 2-MPP-231 Root Valve	Revision 0
Job Order 01179043	Perform Temporary Leak Seal Repair of 2-MPP-231-V1 per TM 2-TM-01-16	
CR 01169036	2-MPP-231-V1 has a body to bonnet steam leak	June 18, 2001

DIT B-02084	Structural Evaluation of piping/tubing for Furmanite enclosure of 2-MPP-231-V1	Revision 0
UFSAR Section 2.5	Engineering Seismology	
Drawing OP-2-5105D	Flow Diagram Steam Generating System Unit No. 2	

1EP6 Drill Evaluation

PMP 2080-EPP-100	Emergency Response	Revision 0
PMP 2080-EPP-101	Emergency Classification	Revision 3
PMP 2080-EPP-107	Notifications	Revision 15a
RMT 2080-EOF.001	Activation and Operation of the EOF	Revision 0
RMT 2080-EOF.002	Emergency Termination and Recovery	Revision 0
RMT 2080-OSC.001	Activation and Operation of the OSC	Revision 0
RMT 2080-TSC.001	Activation and Operation of the EOF	Revision 0