August 12, 2003

Mr. A. C. Bakken III
Senior Vice President
Nuclear Generation Group
American Electric Power Company
500 Circle Drive
Buchanan, MI 49107

SUBJECT: DONALD C. COOK NUCLEAR POWER PLANT, UNITS 1 AND 2
NRC INSPECTION REPORT 50-315/03-07(DRS); 50-316/03-07(DRS)

Dear Mr. Bakken:

On July 11, 2003, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Donald C. Cook Nuclear Power Plant. The enclosed report documents the inspection findings, which were discussed on July 11, 2003, with yourself and other members of your staff.

The inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel. Specifically, this inspection focused on the design and performance capability of the emergency diesel generator system to ensure that it was capable of performing it's required safety-related functions.

Based on the results of this inspection, there was one NRC-identified finding of very low safety significance, which involved a violation of NRC requirements. However, because this violation was non-willful and non-repetitive and because it was entered into your corrective action program, the NRC is treating the issue as a Non-Cited Violation (NCV) in accordance with Section VI.A.1 of the NRC's Enforcement Policy.

If you contest the subject or severity of a Non-Cited Violation, you should provide a response within 30 days of the date of this inspection report, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001, with copies to the Regional Administrator, U.S. Nuclear Regulatory Commission, Region III, 801 Warrenville Road, Lisle, IL 60532-4351; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at the D.C. Cook Nuclear Power Plant.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

***/RA by Andrew Dunlop Acting For/***

David E. Hills, Chief
Mechanical Engineering Branch
Division of Reactor Safety

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

Enclosure: Inspection Report 50-315/03-07(DRS);
50-316/03-07(DRS) w/Attachment: Supplemental Information

cc w/encl: Site Vice President
M. Finissi, Plant Manager
R. Whale, Michigan Public Service Commission
Michigan Department of Environmental Quality
Emergency Management Division
MI Department of State Police
D. Lochbaum, Union of Concerned Scientists

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

***/RA by Andrew Dunlop Acting For/***

David E. Hills, Chief
Mechanical Engineering Branch
Division of Reactor Safety

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

Enclosure: Inspection Report 50-315/03-07(DRS);
50-316/03-07(DRS) w/Attachment: Supplemental Information

cc w/encl: Site Vice President
M. Finissi, Plant Manager
R. Whale, Michigan Public Service Commission
Michigan Department of Environmental Quality
Emergency Management Division
MI Department of State Police
D. Lochbaum, Union of Concerned Scientists

DOCUMENT NAME: C:\ORPCheckout\FileNET\ML032260201.wpd
**To receive a copy of this document, indicate in the box: "C" = Copy without attachment/enclosure "E" = Copy with attachment/enclosure "N" = No copy**

| OFFICE | RIII | E | RIII | | RIII | N | | |
|---|---|---|---|---|---|---|---|---|
| NAME | ADunlop:tr | | EDuncan | | ADunlop for DHills | | | |
| DATE | 08/12/03 | | 08/13/03 | | 08/12/03 | | | |

***OFFICIAL RECORD COPY***

ADAMS Distribution:
WDR
DFT
JFS2
RidsNrrDipmIipb
GEG
HBC
BJK1
C. Ariano (hard copy)
DRPIII
DRSIII
PLB1
JRK1

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

| | |
|---|---|
| Docket Nos: | 50-315; 50-316 |
| License Nos: | DPR-58; DPR-74 |
| Report Nos: | 50-315/03-07(DRS); 50-316/03-07(DRS) |
| Licensee: | American Electric Power Company (AEP) |
| Facility: | Donald C. Cook Nuclear Power Plant, Units 1 and 2 |
| Location: | 1 Cook Place<br>Bridgman, MI 49106 |
| Dates: | June 23, 2003, through July 11, 2003 |
| Inspectors: | A. Dunlop, Reactor Engineer<br>P. Lougheed, Reactor Engineer<br>S. Sheldon, Reactor Engineer<br>H. Anderson, Mechanical Contractor<br>G. Skinner, Electrical Contractor |
| Approved by: | David E. Hills, Chief<br>Mechanical Engineering Branch<br>Division of Reactor Safety |

Enclosure

## SUMMARY OF FINDINGS

IR 05000315/2003-007(DRS), IR 05000316/2003-007(DRS); Indiana Michigan Power Company; 06/23/2003 - 07/11/2003; D.C. Cook Nuclear Power Plant, Units 1 and 2; Safety System Design and Performance Capability Inspection.

This report covers a 3-week announced baseline inspection of the design and performance capability of the emergency diesel generator system. The inspection was conducted by regional engineering specialists with electrical and mechanical consultants' assistance. One Green finding associated with a Non-Cited Violation was identified. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" (SDP). Findings for which the SDP does not apply may be Green, or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 3, dated July 2000.

### A. Inspector-Identified and Self-Revealed Findings

**Cornerstone: Mitigating Systems**

- Green. A finding of very low safety significance was identified involving a Non-Cited Violation of 10 CFR 50, Appendix B, Criterion XVI, Corrective Actions, for the failure to timely resolve Technical Specification interpretation inconsistencies associated with the total required volume in the emergency diesel generator fuel oil day tanks. These inconsistencies were identified by the licensee in August 2000, however, as of July 11, 2003, this issue remained unresolved.

  This finding is greater than minor because the lack of timeliness associated with resolution of this issue impacted the mitigating systems cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. This finding is of very low safety significance because there was not a loss of function as each fuel oil system contained redundant, safety-related fuel oil transfer pumps that would start prior to reaching the unusable volume in the day tank; and that these pumps have shown good reliability. (Section 1R21.2.1)

### B. Licensee-Identified Violations

No findings of significance were identified.

## REPORT DETAILS

### 1. REACTOR SAFETY

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

1R21 Safety System Design and Performance Capability (71111.21)

Introduction

Inspection of safety system design and performance verifies the initial design and subsequent modifications and provides monitoring of the capability of the selected systems to perform design bases functions. As plants age, the design basis may be lost and important design features may be altered or disabled. The plant risk assessment model is based on the capability of the as-built safety system to perform the intended safety functions successfully. This inspectable area verifies aspects of the mitigating systems cornerstone for which there are no indicators to measure performance.

The objective of the safety system design and performance capability inspection is to assess the adequacy of calculations, analyses, other engineering documents, and operational and testing practices that were used to support the performance of the selected systems during normal, abnormal, and accident conditions. The inspection was performed by a team of inspectors that consisted of a team leader, two Region III inspectors, one electrical consultant, and one mechanical consultant.

The emergency diesel generator system was selected for review during this inspection based upon:

- having a high probabilistic risk analysis ranking;
- being a high safety significant maintenance rule system; and
- having an inter related function (for station blackout).

The criteria used to determine the system's performance included:

- applicable Technical Specifications;
- applicable Updated Final Safety Analysis Report (UFSAR) sections; and
- the system's design documents.

The following system and component attributes were reviewed in detail:

System Requirements

Process Medium - water, fuel oil, electricity
Energy Source - electrical power, fuel oil, air
Control Systems - initiation, control, and shutdown actions
Heat Removal - cooling water and ventilation

System Condition and Capability

Installed Configuration - elevation and flow path operation
Operation - system alignments and operator actions
Design - calculations and procedures
Testing - flow rate, pressure, temperature, voltage, and level

Components

The emergency diesel generator heat exchangers, fuel oil transfer pumps, fuel oil day tanks, and air start subsystem were selected for detailed review during the inspection. These components were specifically reviewed for component degradation due to the impact that its failure would have on the plant.

.1 System Requirements

a. Inspection Scope

The inspectors reviewed the UFSAR, Technical Specifications, drawings and available design basis information to determine the performance requirements of the emergency diesel generator system. The reviewed systems attributes included process medium, energy sources, control systems, and heat removal. The rationale for reviewing each of the attributes was:

**Process Medium**: This attribute needed to be reviewed to ensure that the emergency diesel generators would supply the required electrical loading under the design basis events of loss of offsite power and loss of offsite power concurrent with a loss of coolant accident.

**Energy Sources**: This attribute needed to be reviewed to ensure that the emergency diesel generators would start when called upon. In order to ensure that the diesels start, the following subsystems are necessary: direct-current control power, starting air, combustion air, and diesel fuel.

**Controls**: This attribute required review to ensure that the trips of the emergency diesel generator functioned as specified. This included review of trips bypassed during design basis events to ensure that the trips would not erroneously actuate and impact diesel operation.

**Heat Removal**: This attribute required review to ensure that the heat generated while the emergency diesel generators are running can be effectively removed. Three subsystems were included in this review: ventilation air, jacket water cooling, and lubrication oil cooling.

b. Findings

No findings of significance were identified.

.2 System Condition and Capability

a. Inspection Scope

The inspectors reviewed design basis documents and plant drawings, abnormal and emergency operating procedures, requirements, and commitments identified in the UFSAR and Technical Specifications. The inspectors compared the information in these documents to applicable electrical, instrumentation and control, and mechanical calculations, setpoint changes, and plant modifications. The inspectors also reviewed operational procedures to verify that instructions to operators were consistent with design assumptions. The inspectors also used applicable industry standards, such as the American Society of Mechanical Engineers (ASME) Code and the Institute of Electrical and Electronics Engineers (IEEE) Standards, to evaluate plant design.

The inspectors reviewed information to verify that the actual system condition and tested capability were consistent with the identified design bases. Specifically, the inspectors reviewed the installed configuration, the system operation, the detailed design, and the system testing, as described below.

**Installed Configuration**: The inspectors confirmed that the installed configuration of the emergency diesel generator system met the design basis by performing detailed system walkdowns. The walkdowns focused on the installation and configuration of piping, components, and instruments; the placement of protective barriers and systems; the susceptibility to flooding, fire, or other environmental concerns; physical separation; provisions for seismic and other pressure transient concerns; and the conformance of the currently installed configuration of the systems with the design and licensing bases.

**Design**: The inspectors reviewed the mechanical, electrical, and instrumentation design of the emergency diesel generator system to verify that the systems and subsystems would function as required under accident conditions. This included a review of the design bases, design changes, design assumptions, calculations, boundary conditions, and models as well as a review of selected modification packages. Instrumentation was reviewed to verify appropriateness of applications and setpoints based on the required equipment function. Additionally, the inspectors performed limited analyses in several areas to verify the appropriateness of the design values.

**Testing**: The inspectors reviewed records of selected periodic testing and calibration procedures and results to verify that the design requirements of calculations, drawings, and procedures were incorporated in the system and were adequately demonstrated by test results. Test results were also reviewed to ensure automatic initiations occurred within required times and that testing was consistent with design basis information.

b. Findings

Introduction: The inspectors identified a Green Non-Cited Violation (NCV) involving 10 CFR 50, Appendix B, Criterion XVI, Corrective Actions, for the failure to promptly correct a condition adverse to quality. Specifically, the licensee was untimely in

resolving Technical Specification requirement interpretation inconsistencies concerning the volume of fuel oil required in the emergency diesel generator (EDG) day tanks.

Description: A licensee review of the calculation for the EDG fuel oil day tank level identified several examples of inconsistencies regarding the licensee's interpretation of a Technical Specification requiring 70 gallons of fuel oil in the day tank. On different occasions, the requirement had been interpreted as either total contained volume or total usable volume. There were also inconsistencies regarding the calculation of the total unusable volume in the day tank, and which variables must be included in the calculation. Depending on these assumptions and interpretations, the licensee's implemented administrative limit (minimum of 140 gallons in fuel oil day tank) may not be adequate to ensure that the Technical Specification minimum of 70 gallons was maintained at all times.

Calculation MD-12-DG-004-N determined the total unusable volume in the day tank as a combination of geometrical and vortexing factors. In this calculation, the geometrical aspect considered that the top of the horizontal tank outlet was located approximately 4 inches above the bottom of the tank, such that the unusable tank volume due to the tank/piping geometry was approximately 29 gallons. The vortexing aspect took into account that a pipe outlet below the surface of a fluid may induce a surface vortex, which would allow air to pass into the outlet pipe. This calculation determined that maintaining a minimum tank volume of approximately 33 gallons above the outlet pipe would eliminate any possible vortexing issues. Thus, the total unusable volume due to tank/pipe geometry and vortexing considerations was determined to be approximately 62 gallons. This calculation non-conservatively interpreted the Technical Specification requirement as 70 gallons total contained volume in the tank, which inferred that 8 gallons usable volume existed at the Technical Specification limit. This 8 gallons usable volume corresponds to an 111-second EDG run time at full load.

Other examples illustrated the licensee's interpretation of the Technical Specification limit as the total usable volume. Calculation 1-2-LI-06, Section II, Calculation #1, verified the appropriate placement of set points and switches on the fuel oil day tank corresponding to the low-low level alarms (currently set at 104 total gallons) and fuel oil transfer pump start (currently set at total tank volume of 123 gallons decreasing). This calculation interpreted the requirement as the total usable volume in the day tank, and appropriately verified placement of the switches to maintain this level. However, this calculation, in a non-conservative fashion, did not consider possible vortexing effects in the calculation of the total unusable volume.

The licensee identified the inconsistencies regarding the interpretation of the Technical Specification minimum volume requirement, and initiated condition report (CR) P-00-11222 in August 2000 to resolve the issue. As of July 11, 2003, this issue remained unresolved. Using calculation MD-12-DG-004-N as a basis, and interpreting the Technical Specification limit as useable volume as well as incorporating geometry, vortexing, and instrument uncertainty considerations, the fuel oil day tank minimum required volume could have been 170 gallons, which exceeded the administrative limit of 140 gallons. The final resolution of the administrative limit, as well as the functional placement of the switches corresponding to the low-level alarms and the fuel oil transfer

pumps start both rely on a consistent interpretation of the Technical Specification required volume (i.e., contained versus usable).

Analysis: This issue was a corrective action deficiency resulting in a finding of very low safety significance (Green). The deficiency was due to the licensee's failure to timely resolve the interpretation of the Technical Specification requirement of 70 gallons of fuel oil in the day tank.

This finding is greater than minor because the lack of timeliness associated with resolution of this issue impacted the mitigating systems cornerstone objective of ensuring the availability, reliability and capability of systems that respond to initiating events to prevent undesirable consequences, through a loss of safety margin in the EDG fuel oil day tanks.

This finding was evaluated with the Significance Determination Process (SDP) Phase I, and found to be of very low safety significance (Green). No EDG system functionality was lost due to redundant, safety-related fuel oil transfer pumps that would start prior to reaching the unusable volume in the day tank and that these pumps have shown good reliability. Thus this issue was not considered an operability concern, but a loss of safety margin, especially due to the relatively small size of the day tank.

Enforcement: 10 CFR 50, Appendix B, Criterion XVI states, in part, that "measures shall be established to assure that conditions adverse to quality....are promptly identified and corrected."

Contrary to the above, as of July 11, 2003, the licensee did not promptly correct the identified inconsistencies in the Technical Specification interpretation for the required volume in the EDG fuel oil day tank.

Because of the low safety significance of this issue, the issue was considered non-willful and non-repetitive, and the issue was in the licensee's corrective action program (CR 03190012), the issue is being treated as a Non-Cited Violation, consistent with Section VI.A.1 of the NRC Enforcement Policy (NCV 50-315, 316/2003007-01).

.2 Degraded Voltage Protection Bypassed

Introduction: The degraded voltage protection scheme was bypassed whenever the 4160V buses were not being supplied through the reserve auxiliary transformers (RATs). This resulted in a lack of automatic degraded voltage protection during normal operation, and for the first 30 seconds of an accident when engineered safety feature (ESF) loads were being sequenced onto the safety buses. This is considered an unresolved item pending further review to determine the plant's licensing basis with respect to this issue.

Description: In order for the trip function of the degraded voltage scheme to be active, the supply breaker to the 4160V bus from the RATs must be closed. During normal operation the 4160V buses were supplied through the unit auxiliary transformers (UATs) so the supply breakers from the RATs were open and the trip function of the degraded voltage protection scheme was disabled. This condition also existed for the first 30

seconds of an accident when the majority of ESF loads would be sequenced onto the safety buses. This was due to a deliberate 30 second time delay between the time a turbine trip signal was initiated by the reactor protection system, and the time the 4160V buses would be transferred from the UATs to the RATs. The relaying relied upon to transfer the 4160V buses to the RATs was non-safety related.

This was contrary to the design criteria for degraded voltage protection stated in the Generic Letter dated June 3, 1977, and later incorporated into Branch Technical Position PSB #1 [Power Systems Branch], which stated, "The voltage sensors shall automatically initiate the disconnection of offsite power sources whenever the voltage set point and time delay limits have been exceeded." Technical Specifications 3.3.2.1, Table 3.3.3, item 8.b, required degraded voltage protection whenever the units were in modes 1, 2, 3 and 4. Neither the Technical Specifications nor its bases provided for bypassing the protection scheme when the units were connected to the UATs.

The licensee position was that degraded voltage protection was only required when the unit was connected to the "offsite" source. The licensee interpreted the term "offsite" to include only the RAT source and not to include the UAT source.

The inspectors reviewed the available record of correspondence and other communications between the licensee and the NRC and noted considerable ambiguity regarding the acceptability of this design. The original design for degraded voltage protection proposed by the licensee (July 22, 1977 letter) featured a design where the safety buses would not be protected while being supplied by the UATs. The proposed design used undervoltage relays on the high side of the 34.5kV/4.16kV RATs in order to monitor the offsite power supply directly. The NRC rejected this proposal and required the degraded voltage relays to monitor the 4160V safety busses citing the 1997 NRC Generic Letter, which required the design of the voltage monitors to comply with IEEE-279-1971. The letter stated that the intent of the position was that the monitors of the undervoltage protection system for ESF loads were a part of the Class 1E distribution system.

The current design had the voltage monitors on the 4160V safety buses, but they only provided a trip function when the buses were supplied by the RATs. The licensee has described the UAT connection as the "normal" power supply and the RAT connection as the "preferred offsite" power supply. In general, the licensee has been consistent in stating that degraded voltage protection was available only when the 4160V buses were connected through the RATs, and not when connected to the UATs. However, it appeared that the significance of this distinction had not been noted by the NRC until it was stated explicitly in Technical Specifications change request AEP:NRC 1063, dated November 28, 1988, as follows, "Please note that the function of the Degraded Voltage relays is to disconnect the plant from the grid for a sustained degraded voltage condition. These relays are armed only when the plant is fed from offsite power and not normally active during unit operation." This statement did not note that the degraded voltage function was also not active for the critical first 30 seconds of an accident.

The NRC took note of the licensee's 1988 statement in the cover letter to Amendment Nos. 137 and 124 to License Nos. DPR-58 and DPR-74, dated May 25, 1990.

The NRC stated that the design was not in conformance with Standard Review Plan (SRP), Chapter 8, Appendix 8A, Branch Technical Position PSB #1 and recommended that the degraded voltage relays "remain in force regardless of the power sources connected to the safety busses; i.e., whether powered by the unit auxiliary transformer or the off-site power system."

The licensee stated in an internal memo from M. J. Finissi to G. P. Argent, dated April 22, 1993, that, "It is agreed that there is non-compliance with Branch Technical Position PSB #1." The memo justified the non-compliance based on two reasons; (1) there was a potential for tripping the degraded voltage scheme during operation under light load conditions on the grid with reduced generator voltage; and (2) AEP was not committed to Branch Technical Position PSB #1. The inspectors questioned the technical adequacy of this evaluation because an accident could occur when generator voltage was low and automatic protection of ESF loads was bypassed. It did not appear that either this memo or any other formal response to the May 25, 1990, NRC recommendation was provided to the NRC. Task Interface Agreement (TIA) dated June 10, 1994, for D.C. Cook stated, "After the Millstone and ANO-1 events, the staff developed generic requirements for degraded grid protection. Under MPA B-23, all licensees were required to address degraded voltage conditions. These generic requirements were subsequently documented in Branch Technical Position BTP-1 in the SRP. Therefore, Office of Nuclear Reactor Regulation (NRR) considers the requirements for degraded voltage protection to be part of the plant's current licensing basis." Therefore, although specific commitments to PSB #1 may not have been made, it appeared that conformance to PSB #1 may have been assumed in previous licensing actions.

There was no record that the NRC formally reviewed and accepted the existing scheme, particularly with respect to the bypassing of degraded voltage protection during the first 30 seconds of an accident.

Analysis: Although the inspectors concluded that bypassing the degraded voltage protection during normal operations when offsite power is supplied through the UATs is not in accordance with the 1977 Generic Letter and Branch Technical Position PSB #1, the licensee stated that they are not committed to the Branch Technical Position and this issue had been resolved during the extended shutdown of the Cook units. The licensee was unable to provide any documentation or details of this resolution during the inspection. In addition, this position, does not appear to conform to the 1994 TIA in which NRR implied that Branch Technical Position PSB #1 was part of the plant's current licensing basis. Based on this conflicting information, this will be considered an unresolved item (URI 50-315, 316/2003007-02) pending further NRC review to determine the current licensing basis for the Cook facility with respect to degraded voltage protection and whether the licensee is in conformance with Technical Specifications 3.3.2.1.

Enforcement: The enforcement aspects of this issue will be determined after further NRC evaluation of the unresolved item.

.3 Components

a. Inspection Scope

The inspectors examined the emergency diesel generators to ensure that component level attributes were satisfied. The attributes selected for review were: equipment and environmental qualification, equipment protection, and operating experience.

**Equipment and Environmental Qualification**: To confirm this attribute, the inspectors reviewed calculations and equipment qualification documents to ensure that components located in the emergency diesel generator rooms would perform their function under the temperatures that would be expected.

**Equipment Protection**: The inspectors reviewed calculations and other documents, performed walkdowns and interviewed personnel to ensure that components located in the emergency diesel generator rooms would perform their function following seismic, tornado, and high energy line break events.

**Operating Experience**: The inspectors reviewed condition reports, problem identification forms, and other documents to confirm that the licensee adequately evaluated industry information regarding emergency diesel generator problems.

b. Findings

No findings of significance were identified.

## 4. OTHER ACTIVITIES (OA)

4OA2 Identification and Resolution of Problems

a. Inspection Scope

The inspectors reviewed a sample of auxiliary feedwater and emergency diesel generator systems problems that were identified by the licensee and entered into the corrective action program. The inspectors reviewed these issues to verify an appropriate threshold for identifying issues and to evaluate the effectiveness of corrective actions related to design issues. In addition, condition reports initiated on issues identified during the inspection were reviewed to verify adequate problem identification and incorporation of the problem into the corrective action system. The specific corrective action documents that were sampled and reviewed by the inspectors are listed in the attachment to this report.

b. Findings

One Green Finding was identified concerning untimely corrective actions as discussed in section 1R21.2.1 of this report.

4OA6 Meetings

.1 Exit Meeting

The inspectors presented the inspection results to Mr. A. Bakken, and other members of licensee management at the conclusion of the inspection on July 11, 2003. The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

ATTACHMENT: SUPPLEMENTAL INFORMATION

## SUPPLEMENTAL INFORMATION

## KEY POINTS OF CONTACT

Licensee
D. Baker, Manager, Engineering, Nuclear Technical Services
C. Bakken, Senior Vice President, Nuclear Generation
A. Feliciano, Design Engineering
M. Finissi, Plant Manager
J. Giessner, Director, Design Engineering and Regulatory Affairs
H. Heidarisafa, Electrical Design/EQ
G. Hines, AFW System Engineer
R. Jervey, Regulatory Affairs
J. Kovarik, I&C Design Engineering
B. McIntyre, Manager, Regulatory Affairs
B. Mutz, Operations
J. Pollock, Site Vice President
M. San, Design Engineering
M. Scarpello, Compliance Supervisor
G. Truini, EDG System Engineer
B. Wah, Design Engineering

Nuclear Regulatory Commission
D. Hills, Chief, Mechanical Engineering Branch, RIII
I. Netzel, Resident Inspector
C. Pederson, Director, Division of Reactor Safety, RIII

## LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened and Closed

| | | |
|---|---|---|
| 50-315, 316/03-07-01 | NCV | Untimely Corrective Action for Diesel Fuel Oil Day Tank Level Issue (Section 1R21.2.1) |

Opened

| | | |
|---|---|---|
| 50-315, 316/03-07-02 | URI | Bypassing Degraded Voltage Protection When Power Supplied by Unit Auxiliary Transformers (Section 1R21.2.2) |

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 of 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.

1R21 Safety System Design and Performance Capability

Calculations

1-2-C1-01, Calc 3; Condensate Water Storage Tank Level Scaling Calculation; Revision 1
1-2-L1-03, Calc 1; Diesel Generator Fuel Oil Storage Tank Level Alarms; Revision 0
1-2-L1-06, Calc 1; Fuel Oil Day Tank Level Alarm; Revision 0
1-2-L1-06, Calc.1; Calculation of Fuel Oil Volumes Corresponding to Level Elevations and Verification That Level Alarms and Transfer Pump Control Levels are Above Technical Specification Levels; Revision 1
1-2-UNC-055, Calc 1; EDG Day Tank Level; Revision 0
1-2-UNC-061, Calc 1; EDG Jacket Water Temperature Indicator; Revision 0
1-2-UNC-062, Calc 1; EDG Electrical Load; Revision 2
1-2-UNC-338, Calc 1; Loop Uncertainty for Condensate Water Storage Tank Level; Revision 0
1-2-UNC-338, Calc 2; Loop Uncertainty for Condensate Water Storage Tank Level; Revision 1
1-2-UNC-338, Calc 3; Loop Uncertainty for Condensate Water Storage Tank Level; Revision 2
1-E-N-ELCP-4KV-001; Unit 1 4kV/600V Load Control Calculation; Revision 1, CS-7
1-E-N-ELCP-250-006; 250VDC Battery 1CD System Analysis; Revision 0, CS-4
1-E-N-ELCP-250-008; 250 VDC Battery 1N System Analysis; Revision 0
1-E-N-ELCP-DGEN-001; DG CT Error Calculation; Revision 0
1-E-N-PROT-RLY-003; Degraded Grid Voltage and Loss of Voltage Relay Setting Calculation; Revision 0, CS-2
1-E-N-PROT-RLY-009; Unit 1 Potential Transformer Burden and Error Calculation; Revision 0, CS-1
2-E-N-ELCP-4KV-001; Unit 2 4kV/600V Load Control Calculation; Revision 3
2-E-N-ELCP-250-008; 250 VDC Battery 2N System Analysis; Revision 0
2-E-N-PROT-RLY-003; Degraded Grid Voltage and Loss of Voltage Relay Setting Calculation; Revision 1, CS-1
12-UNC-056, Calc 1; DG Fuel Oil Storage Tank Level; Revision 1
C-7-Index; Original Calculation for EDG Fuel Consumption Rate; Revision 1; dated March 28, 2000
ENSM980327JDJ; Results of Operating the Diesel Generator Lube Oil Cooler and Jacket Water Cooler at Elevated Essential Service Water Temperatures; May 17, 2003
ENSM980819AF; Auxiliary Feedwater System Design Basis Analysis; Revision 0
MD-01-AFW-030-N; Torque and Thrust Setup Calculation for 1-FMO-212, 1-FMO-222, 1-FMO-232 and 1-FMO-242; Revision 1

MD-12-AFW-037-N; Differential Pressure Across the Auxiliary Feedwater Pump Room Boundaries as a Result of Design Basis Tornado; Revision 1
MD-12-AFW-038-N; Minimum Operability Limits for Motor-Driven Auxiliary Feedwater Pumps; Revision 0
MD-12-CST-001-N; Condensate Storage Tank Usable Volume and Vortexing; Revision 0, CS-1
MD-12-DG-001-N; Emergency Diesel Generator Backup Air Supply System Capacity and Overpressure Analysis; Revision 1
MD-12-DG-003-N; Capacity Requirement for Emergency Diesel Generators Starting Air System; Revision 0
MD-12-DG-004-N; Diesel Fuel Oil Consumption Rate Verification of EDG Fuel Oil Storage Tank and Fuel Oil Day Tank Volumes, Transfer Pump and Diesel Exhaust Line Sizing; Revision 1
MD-12-DG-006-N; Emergency Diesel Generator (EDG) Lubricating Oil Sump Tank Volumes and Levels; Revision 0
MD-12-DG-009-N; Emergency Diesel Generator Starting Air Receiver Minimum Pressure, Compressor Reliability, and Test Acceptance Criteria for Air Receiver Operating Pressure Range of 213.5 to 225 psig; Revision 0
MD-12-ESW-078-N; Emergency Diesel Generator Tube Plugging Allowance; May 17, 2003
MD-12-HV-020-N; Heat Gain Calculation and Maximum/minimum Temperature Determination for the Emergency Diesel Generator Rooms 1,2AB and 1,2CD; Revision 2
MD-12-HV-022-N; N-Train Battery Room Hydrogen Analysis and Maximum Temperature during Normal Plant Operation; Revision 1
MD-12-HV-029-N; N-Battery Room Station Blackout Temperature Analysis; Revision 0
NED-2000-537-REP; Flooding Analysis for AEP; dated May 19, 2000
PS-34KVP-004; 4-kV Balance of Plant Bus Synchronizing; dated November 15, 1994
PS-EDGP-001; EDG Overload and Over Current Relay Setting; dated January 10, 1995
PS-EDGP-003; EDG Negative Sequence Calculation; dated March 28, 1993
SL-5369; Flooding Evaluation for AEP; dated May 31, 2000

Condition Reports

00349011; ECP/ICP 1-2-F2-10 Calculated Flow Orifice 1-FF1-210, 220, 230, 240 as Vena Contracta Type Orifices When They Are Flange Tap Orifices; dated December 13, 2000
01108005; Valve 2-SV-81-CD2, CD Emergency Diesel Starting Air Compressor QT-142-CD2 Safety Valve, Failed Open; dated April 19, 2001
01117046; Apparent Weakness in Functional Testing of Logic Circuit for EDG Fuel Oil Transfer Pumps; dated April 27, 2001
01120001; 1 CD (2AB) EDG Room Exhaust Fan Is Rotating Backwards (about 80 rpm); dated April 30, 2001
01139013; Fillet Welds That Attach the Support Legs to the Diesel Silencers #1-QT-104-AB and 2-QT-104-CD Have Cracks in Them; dated May 19, 2001
01191011; Tempering Air Damper 1-HV-DDP-CD-1 Does Not Function Properly; dated July 10, 2001
01208057; Impact Assessments for Calculations 1(2)-E-N-PROT-RLY-002 Fail to Identify the Impact on the Appendix R Program; dated July 27, 2001
01213035; Auxiliary Feedwater Flow Indicator Out of Spec
01263067; Numerous Problems with Emergency Diesel Starting Air Receiver Relief Valves over the Years; dated September 21, 2001

01280015; Failure of 2-FMO-242 to Throttle on High Flow
01291039; Internal Piece Parts of the Motor Driven AFW Pump Should Be Reclassified as Safety-Related; dated October 18, 2001
01343015; Discovered Emergency Diesel Generator 1AB Voltage Potentiometer Settings Incorrect; dated December 9, 2001
02033013; Snubber Installed Backwards to the Drawing and Stud Has Less Than Full Thread Engagement; dated February 1, 2002
02033020; AFW Snubber Installed Backwards to the Drawing; dated February 1, 2002
02033039; Snubber Installed Backwards to the Drawing; dated February 1, 2002
02047041; U1 CD D/G Failed its Acceptance Criteria; dated February 16, 2002
02102005; Safety Valve Refurbishment Found Release Nut and Adjusting Screw Loose and the Nozzle Had Deep Pits; dated April 12, 2002
02147015; Investigation of 1F EDG Fuel Injection Pump Stuck Open; dated May 27, 2002
02219071; Increasing Vibration Levels on 2-PP-3E Motor; dated August 7, 2002
02250001; DG2CD Started Faster than Expected; dated September 7, 2002
02262030; OE 14556 Identifies Potential Inaccuracies with Check Valve Hydraulic Modeling Program; dated September 19, 2002
02287067; OE14680-Effect of Harmonics on Second Level Under-Voltage Relay Accuracy; dated October 14, 2002
03022027; Gap Between Strainer Basket and Door, and Strainer Housing and Strainer Basket. Debris Found in Basket; dated January 22, 2003
03027059; EDG Electronic Governor Modules Potentiometer Reversal; dated April 24, 2003
03032004; Discovered Knife Switches Pulled During IMP.609 Caused CD Emergency Diesel Generator to Be Inoperable; dated February 1, 2003
03037037; CD EDG Starting Air Receiver Safety Valve Is Leaking; dated February 6, 2003
03039025; 2AB Voltage Potentiometer Settings Incorrect; dated February 8, 2003
03072023; Governor Precaution not Captured in Procedures; dated March 13, 2003
03095009; Leakage in Foundation of U1 CD EDG Fuel Oil Transfer Pump Room; dated April 5, 2003
03106058; 2-FW-160, West MDAFW Pump Leakoff Check Valve Leaked by During the Performance of 2-OHP-4030-STP-017E; dated April 16, 2003
031121079; Position Paper That Showed Potential Diesel Overload Due to High Frequency Not Formally Dispositioned; dated May 1, 2003
03126024; NRC Regulatory Issue Summary 2003-09, Environmental Qualification of Low Voltage Instrumentation and Control Cables; dated May 6, 2003
03148024; Technical Specifications Content Needs to Include Testing of 600vac Crosstie Interlocks; dated May 28, 2003
03135018; Incorrect Surveillance Test Performed on 2-BATT-N; dated May 15, 2003
03152058; Eleven Cells on 2-BATT-N Post Equalize Specific Gravity Readings Corrected More than 10 Points (.010) below the Average of 1.248; dated June 1, 2003
03155096; Reviews from SOER 03-1 Reveal Documentation Errors Regarding Application of GDC 17 and Safety Guide 6 Criterion to 600 VAC Tie Breakers; dated June 4, 2003
03162017; Documenting a Systematic Approach & Identification for the Fundamental Building Blocks for the Cable Aging Management Program (CAMP); dated June 11, 2003
03162027; To Remove the 450 gpm of ESW Backup Supply to the AFW System from the Total ESW Flow Requirements, Requires a UFSAR Change; dated June 11, 2003
P-99-14782; No Information to Verify That the AFW T&T Valves Are Installed, Maintained and Tested as Needed to Support the Requirements of the System; dated June 7, 1999
P-99-20660; MCM-221/231 Removed from the EQ Program; dated August 10, 1999

P-99-27153; ECP 12-CI-01 is Incorrect; dated November 10, 1999
P-00-03109; Superceded Calculations, Uninstalled DCPs, Equip. Not Meeting Acceptance Criteria, and Recommendations in 2-E-N-ELCP-4KV-001; dated February 23, 2000
P-00-03741; Impact Assessment of Calculation MD-12-CST-001-N, Rev. 0, CST Usable Volume and Vortexing; dated March 6, 2000
P-00-04879; Diesel Fuel Oil Transfer Pumps Discharge Pressure Instruments Do Not Comply with the IST Code; dated March 29, 2000
P-00-06029; Potential Problems with the Installation of 2-DCP-4261; dated April 25, 2000
P-00-06786; Relationships Between the EDG Fuel Oil Tank Calculations Are Not Adequately Documented; dated May 05, 2000
P-00-09439; Calculation 1-E-N-ELCP-4KV-001 Equipment Not Meeting Acceptance Criteria, Limitations, Uninstalled DCPs and Superceded Calculations; dated June 30, 2000
P-00-10423; 1-HV-DGS-3 Operating Amperage Higher than Motor Nameplate; dated July 25, 2000
P-00-11222; Technical Specification Requirement of Fuel Oil Day Tank Volume; dated August 11, 2000

Condition Reports Written as a Result of the Inspection

03175043; 1-LFI-125 Indicates 10GPM with no Flow; dated June 24, 2003
03176009; No Tracking Mechanism for Painting EDG Coolers; dated June 25, 2003
03176038; 2-CDA-253 indicating 6" dp with No Strainer Flow; dated June 25, 2003
03176040; Past Water Leakage in Both Unit 1 EDG Lube Oil Pits; dated June 25, 2003
03176043; Doors 1-292A and 2-293A Have Gaps Between the Opening Structure and the Door; dated June 25, 2003
03177006; Cable Drive for 2-DR-TUR293 Missile Door Is Frayed; dated June 26, 2003
03178069; Elevation for CST Level Transmitters Different than DB Documents; dated June 27, 2003
03183037; Calculation MD-12-ESW-078-N Assumption 7.1 Question; dated July 2, 2003
03184013; Water in Fuel Oil Transfer Pump Room Sump; dated June 24, 2003
03189008; Acceptance Criteria in EDG Bypass Trip Testing Weak; dated July 8, 2003
03190012; CR 00-11222, Related to the “Contained” Versus “Usable” Volume of the EDG Day Tanks, Does Not Clearly Document the Resolution of the Issue; dated July 9, 2003
03190025; Cancel Calculation MD-12-DG-001-N; dated July 9, 2003
03190055; Unit 2 West MDAFP Blowout Panel 2-HV-AFP-BP-4 Was Not in Proper Alignment; dated July 9, 2003
03191039; As-Found Tolerance Exceeded with no CR Written; dated July 10, 2003

Design Basis Documents

DB-12-AFWS; Auxiliary Feedwater System; Revision 1
DB-12-EDG; Emergency Diesel Generators; Revision 0
DB-12-EDGS; Emergency Diesel Generator Support Systems; Revision 0

Design Information Transmittal

DIT-B-00741-01; Emergency Diesel Generator Starting Air System Field Data Collection; dated February 14, 2000

DIT-B-01161-01; ESW Loads - Concurrently Supplying CTS and AFW Suction Supply; dated May 15, 2000
DIT-B-02317-00; ESW Flow Verification Test Target Flows for 01-OHP-4030-119-022FV & 02-OHP-4030-219-022V; dated March 16, 2002

Drawings

1-5191-6; Transformer Decks Drains & Piping Diesel Fuel Oil Storage Tank & Piping Unit No. 1; Revision 6
1-2-AEP-WORT-W-590930CE; Arrangement of Governor Control Linkage; Revision 0
12-5125A-22; Flow Diagram Sta. Drainage-Turb. Rm. Unit No. 1 or 2 Sheet 2 of 2; Revision 22
12-5180-22; Station Drainage Piping in Fill and Slab Diesel Generator Area; Revision 22
OP-1-12001-65; Main Auxiliary One-Line Diagram Bus “A” & “B” Engineered Safety System Train “B”; Revision 65
OP-1-12002-53; Main Auxiliary One-Line Diagram Bus “C” & “D” Engineered Safety System Train “A”; Revision 53
OP-1-5106A-56; Flow Diagram Aux-Feedwater; Revision 56
OP-1-5151A-44; Flow Diagram Emergency Diesel Generator “AB” Unit No. 1; Revision 44
OP-1-5151B-56; Flow Diagram Emergency Diesel Generator “AB” Unit No. 1; Revision 56
OP-1-5151C-50; Flow Diagram Emergency Diesel Generator “CD” Unit No. 1; Revision 50
OP-1-5151D-61; Flow Diagram Emergency Diesel Generator “CD” Unit No. 1; Revision 44
OP-1-98013-30; Diesel Generator 1AB and Auxiliaries Elementary Diagram; Revision 30
OP-1-98014-28; Diesel Generator 1CD & Auxiliaries Elementary Diagram; Revision 28
OP-1-98016-37; Diesel Generator 1AB Misc. Auxiliaries Elementary Diagram; Revision 37
OP-1-98017-42; Diesel Generator 1CD Misc. Auxiliaries Elementary Diagram; Revision 42
OP-1-98021-40; Gen & Differential Elementary Diagram; Revision 40
OP-1-98043-43; 4KV Diesel Generator 1AB A.C.B. Elementary Diagram; Revision 43
OP-1-98045-23; 4kV/600V Auxiliary Transformers 11A & 11C Elementary Diagram Sheet 1 of 2; Revision 23
OP-1-98050-24; Reserve Bus Tran. and Auxiliary Buses Low Voltage Protection Elementary Diagram; Revision 24
OP-1-98214-41; Motor Driven Aux. Feedwater Supply Sys. Sheet No. 1 Elementary Diagram; Revision 41
OP-1-98215-60; Turbine Driven Aux. Feedwater Supply System Sheet No. 1 Elementary Diagram; Revision 60
OP-1-98216-20; Turbine Driven Aux. Feedwater Supply System Sheet No. 2 Elementary Diagram; Revision 20
OP-1-98217-23; Motor Driven Aux. Feedwater Supply Sys. Sheet No. 2 Elementary Diagram; Revision 23
OP-1-98218-34; Motor Driven Aux. Feedwater Supply Sys. Sheet No. 3 Elementary Diagram; Revision 34
OP-1-98219-16; Motor Driven Aux. Feedwater Supply Sys. Sheet No. 2 Elementary Diagram; Revision 16
OP-1-98510-7; Motor Driven Aux. Feedwater East Pump Start Up Functional Diagram; Revision 7
OP-1-98515-7; Motor Driven Aux. Feedwater West Pump Start Up Functional Diagram; Revision 7

OP-2-12001-34; Main Auxiliary One-Line Diagram Bus “A” & “B” Engineered Safety System Train “B”; Revision 34
OP-2-12002-30; Main Auxiliary One-Line Diagram Bus “C” & “D” Engineered Safety System Train “A”; Revision 30
OP-2-5106A-49; Flow Diagram Auxiliary Feedwater; Revision 49
OP-2-5151A-51; Flow Diagram Emergency Diesel Generator “AB” Unit No. 2; Revision 51
OP-2-5151B-59; Flow Diagram Emergency Diesel Generator “AB” Unit No. 2; Revision 59
OP-2-5151C-47; Flow Diagram Emergency Diesel Generator “CD” Unit No. 2; Revision 47
OP-2-5151D-56; Flow Diagram Emergency Diesel Generator “CD” Unit No. 2; Revision 56
OP-2-98214-39; Motor Driven Auxiliary Feedwater Supply Sys. Sheet No. 1; Revision 39
OP-2-98214-40; Motor Driven Auxiliary Feedwater Supply Sys. Sheet No. 1; Revision 40
OP-2-98215-54; Turbine Driven Auxiliary Feedwater Supply System Sheet No. 1 Elementary Diagram; Revision 54
OP-2-98216-21; Turbine Driven Auxiliary Feedwater Supply System Sheet No. 2 Elementary Diagram; Revision 21
OP-12-5125-50; Flow Diagram Sta. Drainage-Turb. Rm. Unit No. 1 or 2 Sheet; Revision 50
OP-12-5125A-22; Flow Diagram Sta. Drainage-Turb. Rm. Unit No. 1or 2 Sheet 2 of 2; Revision 22
SOD-03201-002, Sheet 1; EDG Fuel Oil and Lube Oil Systems; Revision 2
SOD-05600-001, Sheet 1; Auxiliary Feedwater System; Revision 3

Miscellaneous

ECP 1-2-O0-36; Post Accident Monitoring Instrumentation; Revision 4
VDS-1-FMO-242; Control Switch Settings for 1-FMO-242; Revision 0
EQ-0559; Environmental Qualification Evaluation of Limitorque Actuators, installed at DC Cook Power Plant, Units 1 & 2; Revision 1
American Electric Power Service Corporation Letter/memorandum (R. I. Pawliger to R. W. Jurgensen - Bridgman); Subject: Pre-Operational Test Procedures Review, Emergency Diesel Generators; dated October 25, 1974
N89089; Safety Evaluation Report of IST Program for Pumps and Valves, D.C. Cook Units 1 & 2; dated August 29, 1989
AEP:NRC 1063; Revised Engineered Safety Feature 4 KV Bus Loss of Voltage and Degraded Voltage Trip Setpoints and Allowable Values-Tech Spec Change Request; dated November 28, 1988
Memo M.J. Finissi to G.P. Argent; Degraded-Grid Design Basis; dated April 22, 1993
Letter 06046; Results of Analysis of Effects of Degraded Grid Voltage on Operability of Safety Related Equipment; dated November 17, 1976
Letter 77053; Comparison of Emergency Power Systems with Staff Positions of June 3, 1977 Letter From NRC; dated July 22, 1977
AEP:NRC 0268B; Additional Information on Degraded Grid Voltage; dated May 28, 1980
RIII (AITS 93-0426) TIA; Questions on the Licensing Basis of the Electrical Distribution System Indiana Michigan Power Company D.C. Cook Units 1 and 2; dated June 10, 1984
N80093; Amendment 39 to License DPR-58, Unit 1; dated July 25, 1980
N81074; Acceptance of Responses on Adequacy of Station Electrical Distribution System Voltages for D.C. Cook Units 1 and 2; dated June 1, 1981
N90072; Amendment Nos. 137 and 124 to Facility Operating License Nos. DPR-58 and DPR-74: (TAC Nos. 71407 and 71410); dated May 25, 1990

N2002010; Request for Additional Information, “License Amendment Request Engineered Safety Feature Actuation System Instrumentation Trip Setpoints” (TAC Nos. MB3499); dated February 21, 2002
N2002021; Issuance of Amendment 268 (TAC No. MB3499); dated April 19, 2002

Modifications

1-DCP-286; AFW Suction from ESW; Revision 0
1-DCP-483; EDG 1AB Starting Air Compressor Replacement; Revision 0
1-DCP-526; Upgrade of EDG High Pressure Fuel Injection Lines; Revision 0
1-DCP-744; Unit 01 Upgrade of EDG High Pressure Fuel Injection Lines Testing Packet; Revision 0
1-DCP-4504; Replace Reserve Auxiliary Transformers 101AB and 101CD with Load Tap Changing Transformers; Revision 0
1-DCP-4631; Unit 1 LOCA/LOOP Anti-Pump Reset Modification; Revision 0
1-DCP-4894; Modify Standby Readiness Position of TDAFP Discharge Valves; Revision 0
1-DCP-5066; East Motor Driven/Turbine Driven AFW Pump Casing Upgrade; Revision 0
1-DCP-5152; Remove Auto-Open of Backup ESW Inlet Motor Operated Valves to EDG Coolers on EDG Running; Revision 0
2-DCP-526; Upgrade of EDG High Pressure Fuel Injection Lines; Revision 0
2-DCP-4261; Modification of AFW Pump Rooms Ventilation System; Revision 0B
2-DCP-4324; Tornado Missile Shield for EDG No. 2AB Combustion Air Intake Structure Testing Packet; Revision 0
12-DCP-0611; Re-Route of Emergency Diesel Generator Sump Drains to New Waste Oil Storage Tank, Revision 0
12-DCP-0817; Revise Aux. Feedwater Flow Retention Circuit; Revision 0
1-CMM-30029; Replacement of EDG HX Tube Bundles with Alternate Material; Revision 0
EE-2001-0289; 2-QT-104-AB Unit 2 AB Emergency Diesel Exhaust Silencer; Revision 1

Pre-operational and Initial Startup Test Results

PO-050-573F AB; Emergency Diesel Generator Starting Air System; dated October 23, 1974
PO-050-573F CD; Emergency Diesel Generator Starting Air System; dated October 23, 1974
2-PO-050-573F; Emergency Diesel Generator Starting Air System; dated September 21, 1977

Procedures

01-IHP-6030-IMP-309; 4kV Bus Loss of Voltage and 4kV Bus Degraded Voltage Relay Calibration; Revision 5
01-OHP-4021-032-001AB; Diesel Generator 1AB Operation; Revision 6
01-OHP-4021-032-001CD; Diesel Generator 1CD Operation; Revision 5a
01-OHP-4021-032-008AB; Operating DG 1AB Subsystems; Revision 3.0
01-OHP-4021-032-008CD; Operating DG 1CD Subsystems; Revision 3.2
01-OHP-4021-056-001; Filling And Venting Auxiliary Feedwater System; Revision 20.2
01-OHP-4021-056-002; Auxiliary Feed Pump Operation; Revision 20a
01-OHP-4022-055-003; Loss of Condensate to Auxiliary Feedwater Pumps; Revision 6.1

01-OHP-4022-056-001; Steam Binding In Auxiliary Feedwater System; Revision 3
01-OHP-4030-114-034; Local Valve Position Verification Test; Revision 0
02-IHP-6030-IMP-250; 4kV Bus Loss of Voltage and 4kV Bus Degraded Voltage Relay Calibration; Revision 12
02-OHP-4021-032-001AB; Diesel Generator 2AB Operation; Revision 7
02-OHP-4021-032-001CD; Diesel Generator 2CD Operation; Revision 6
02-OHP-4021-032-008AB; Operating DG 2AB Subsystems; Revision 3.0
02-OHP-4021-032-008CD; Operating DG 2CD Subsystems; Revision 3.1
02-OHP-4021-056-001; Filling And Venting Auxiliary Feedwater System; Revision 15.2
02-OHP-4021-056-002; Auxiliary Feed Pump Operation; Revision 13a
02-OHP-4022-055-003; Loss of Condensate to Auxiliary Feedwater Pumps; Revision 6a.1
02-OHP-4022-056-001; Steam Binding In Auxiliary Feedwater System; Revision 3
02-OHP-4023 ECA-0.0; Loss of all AC Power; Revision 12
12-EHP-4030-056-218; Automatic Operation of Auxiliary Feedwater Pumps; Revision 0, Change 4
12-IHP-5030-EMP-001; Limitorque Valve Operator Preventive Maintenance; Revision 5, Change 3
12-IHP-6030-IMP-075; Emergency Diesel Generator Governor Tuning and Adjustment; Revision 1
12-MHP-5021-032-037; Emergency Diesel Generator Woodward Governor Removal and Installation; Revision 3
12-MHP-5021-032-053; Emergency Diesel Engine Fuel Rack Maintenance; Revision 0
PMP-4030-001-001; Impact of Safety Related Ventilation on the Operability of Technical Specification Equipment; Revision 5
12-OHP-5030-001-001, Sections 4.3, 4.5; Operations Plant Tours; Revision 0
PMP-2350-SES-001; 10CFR50.59 Reviews; Revision 1
PMP-4030-001-002; Administrative Requirements for Ventilation Boundary and High Energy Line Break Barriers; Revision 8
PMP-7030-001-001; Prompt NRC Notification; Revision 7
PMP-7030-CAP-001; Corrective Action Program Process Flow; Revision 15

Surveillances (Date Shown Is Date Surveillance Was Completed)

01-OHP-4030-STP-027AB; AB Diesel Generator Operability Test (Train B); dated June 15, 2003
01-OHP-4030-STP-027AB; AB Diesel Generator Operability Test (Train B) / Data Sheet 1 Operating Data; dated between June 9, 2001-May 5, 2003
01-OHP-4030-STP-027CD; CD Diesel Generator Operability Test (Train A) / Data Sheet 1 Operating Data; dated between July 7, 2001-May 6, 2003
01-OHL-5030-SOM-004; Unit 1 Turbine Tour Data Sheet 4-Fuel Oil Day Tank (FODT) Daily Logs, Selected Records, pgs. 56, 61, 75, 81; dated June 2001 through June 2003
02-OHP-4030-STP-027AB; AB Diesel Generator Operability Test (Train B) / Data Sheet 1 Operating Data; dated between July 28, 2001-June11, 2003
02-OHP-4030-STP-027CD; CD Diesel Generator Operability Test (Train A) / Data Sheet 1 Operating Data; dated between Sept 7, 2001 - June 9, 2003
02-OHL-5030-SOM-004; Unit 2 Turbine Tour Data Sheet 4-Fuel Oil Day Tank (FODT) Daily Logs, Selected Records, pgs. 56, 61, 75, 81; dated June 2001 through June 2003

System Descriptions

SD-12-AUXFD-00; Auxiliary Feedwater System; Revision 0
SD-12-DGEN-100; Onsite Emergency Power Distribution; Revision 0
SD-12-DSLFO-100; Emergency Diesel Generator Fuel Oil System; Revision 0
SD-12-DSLLO-100; Emergency Diesel Generator Lubricating Oil System; Revision 0
SD-12-DSLVT-100; Diesel Generator Area and Electrical Switchgear Rooms Ventilation System; Revision 0

System Health Reports

Auxiliary Feedwater System, 4th Quarter 2002
Auxiliary Feedwater System, 1st Quarter 2003
Emergency Diesel Generators, 4th Quarter 2002
Emergency Diesel Generators, 1st Quarter 2003
Emergency Diesel Generator Support Systems, 4th Quarter 2002
Emergency Diesel Generator Support Systems, 1st Quarter 2003

Technical Specifications

3/4.7.1.2; Auxiliary Feedwater System; Unit 1-Amendment 274 & Unit 2-Amendment 254
3/4.7.1.3; Condensate Storage Tank; Unit 1-Amendment 274 & Unit 2-Amendment 254
3/4.7.4.1; Essential Service Water System; Unit 1-Amendment 274 & Unit 2-Amendment 254
3/4.8.1; AC Sources; Unit 1-Amendment 274 & Unit 2-Amendment 254

Updated Safety Analysis Report

Section 8.4; Emergency Power System; Revision 18
Section 10.5.2; Auxiliary Feedwater System; Revision 17.2

Work Orders

01280015; 2-FMO-242 Failed to Throttle Automatically; dated October 8, 2001
C0046056-01; 1-CLR-110, Calibration Data Sheet; dated October 25, 1998
C0046057-01; 1-CLR-111, Calibration Data Sheet; dated October 25, 1998
C0205188; Flange below 2-DF-114C Has Insufficient Thread Engagement on Two of Four Bolts; dated September 06, 2001
R0036878-01; CST Level Indication Calibration - Protection Rack; dated January 19, 1995
R00310006; Analysis of Vibration Increase Noted on Fuel Oil Transfer Pump 1-QT-106-CD1; dated November 05, 2000
R0076806; 12-IHP-6030-IMP-066 and PMT for 1-FFS-244; dated February 26, 2003
R0083522; 1-CLR-110, Calibration Data Sheet; dated January 28, 2003
R0083523; 1-CLR-111, Calibrate Level Loop; dated January 29, 2003
R0088221; Calibrate 1-CLI-114 Loop; dated January 28, 2003
R0096663; Perform 2-BATT-N 60 Month Surveillance; dated May 16, 2003
R0096663; Perform 2-BATT-N 60 Month Surveillance; dated June 3, 2003
R0096967; Perform 2-BATT-N 18 Month Surveillance; dated September 14, 2001

R01070041; Initiate Baseline Testing for Seat Leak Test Data on Fuel Oil Transfer Pumps; dated September 08, 2001
R01070042; Establishment of Baseline Data for Seat Leak and Flow of Fuel Oil Transfer Pumps; dated November 13, 2002
R02047041; Investigate/repair Slow Speed Start; dated November 23, 2002
R0208379; Perform 1-BC-A & 1-BC-B 549 Day (18MO) Surv; dated April 12, 2002
R0208379; Perform 1-BC-A & 1-BC-B 549 Day (18MO) Surv; dated April 17, 2002
R0209683; Perform 1-BATT-N 18 Month Surveillance; dated May 18, 2002
R0212005-01; 1-FFS-258, Calibration Data Sheet; dated January 15, 2002
R0212006-01; 1-FFS-259, Calibration Data Sheet; dated January 15, 2002
R0212007-01; 1-FFS-260, Calibration Data Sheet; dated January 15, 2002
R0223974; Perform 2-BC-A & 2-BC-B 549 Day (18MO) Surv; dated December 17, 2002
R02250001; 2-OME-150-CD, Investigate/repair Slow Start; dated February 11, 2003
R0242177; Perform 2-BATT-N 92 Day Surveillance; dated June 13, 2003
R0242247; Perform 1-BATT-N 92 Day Surveillance; dated June 5, 2003
R03025007; While running DG2CD for Operability, Neither Fuel Oil Transfer Pumps Started to Raise the Day Tank Level as Required; dated January 25, 2003

## LIST OF ACRONYMS USED

| | |
|---|---|
| AC | Alternating Current |
| ADAMS | Agency-wide Document Access and Management System |
| AEP | American Electric Power Company |
| ASME | American Society of Mechanical Engineers |
| CFR | Code of Federal Regulations |
| CR | Condition Report |
| DRS | Division of Reactor Safety |
| EDG | Emergency Diesel Generator |
| ESF | Engineered Safety Feature |
| IEEE | Institute of Electrical and Electronics Engineers |
| IMC | Inspection Manual Chapter |
| IR | Inspection Report |
| kV | kilovolts |
| NCV | Non-Cited Violation |
| NRC | Nuclear Regulatory Commission |
| NRR | Office of Nuclear Reactor Regulation |
| OA | Other Activities |
| PARS | Publicly Available Records System |
| PSB | Power Systems Branch |
| RAT | Reserve Auxiliary Transformer |
| SDP | Significance Determination Process |
| SRP | Standard Review Plan |
| TIA | Task Interface Agreement |
| UAT | Unit Auxiliary Transformer |
| UFSAR | Updated Final Safety Analysis Report |
| URI | Unresolved Item |
| V | Volts |