



**UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
SAM NUNN ATLANTA FEDERAL CENTER
61 FORSYTH STREET SW SUITE 23T85
ATLANTA, GEORGIA 30303-8931**

April 19, 2002

Duke Energy Corporation
ATTN: Mr. W. R. McCollum
Site Vice President
Oconee Nuclear Station
7800 Rochester Highway
Seneca, SC 29672

**SUBJECT: OCONEE NUCLEAR STATION - NRC INSPECTION REPORT 50-269/02-06,
50-270/02-06, AND 50-287/02-06**

Dear Mr. McCollum:

On March 22, 2002, the NRC completed an inspection at your Oconee Nuclear Station. The enclosed report documents the inspection findings which were discussed on March 21, 2002, with you and other members of your staff. Subsequently on April 4, 2002, the inspection findings were discussed again with Mr. L. Nicholson of your staff.

The inspection was an examination of activities conducted under your licenses as they relate to the identification and resolution of problems and compliance with the Commission's rules and regulations and with the conditions of your licenses. Within these areas, the inspection involved a selected examination of procedures and representative records, observations of activities, and interviews with personnel.

On the basis of the sample selected for review, there were no findings of significance identified during this inspection. The team concluded that in general, problems were properly identified, evaluated, and resolved within the problem identification and resolution programs. However, a few minor problems were noted involving corrective actions that were unclear or incomplete, corrective actions improperly closed out to other processes, a slow recovering human performance trend, and some issues that were categorized at a level which may have impacted the responsive and thoroughness of the assigned actions.

DEC

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Sincerely,

/RA/

Robert Haag, Chief
Reactor Projects Branch 1
Division of Reactor Projects

Docket Nos.: 50-269, 50-270, 50-287
License Nos.: DPR-38, DPR-47, DPR-55

Enclosure: NRC Inspection Report 50-269/02-06, 50-270/02-06, 50-287/02-06.
w/ Attachment - Supplemental Information

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DEC

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U. S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket Nos.: 50-269, 50-270, 50-287

License Nos.: DPR-38, DPR-47, DPR-55

Report No.: 50-269/02-06, 50-270/02-06, 50-287/02-06

Licensee: Duke Energy Corporation

Facility: Oconee Nuclear Station, Units 1, 2, and 3

Location: 7800 Rochester Highway
Seneca, SC 29672

Dates: February 25, 2002 - March 1, 2002 and March 18-22, 2002

Inspectors: B. Holbrook, Senior Project Engineer, (Lead Inspector)
T. Morrissey , Resident Inspector - Vogtle
D. Billings, Resident Inspector - Oconee

Approved by: R. Haag, Chief
Reactor Projects Branch 1
Division of Reactor Projects

Enclosure

SUMMARY OF FINDINGS
Oconee Nuclear Station, Units 1, 2, and 3

IR 05000269-02-06, IR 05000270-02-06, and IR 05000287-02-06, on 02/25-03/01/2002 and 3/18-22/2002, Duke Energy Corporation, Oconee Nuclear Station, Units 1, 2, & 3, biennial baseline inspection of the problem identification and resolution program.

The inspection was conducted by a senior project engineer and two resident inspectors. No findings of significance were identified. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described at its Reactor Oversight Process website.

Identification and Resolution of Problems

The inspectors determined that, in general, the licensee's corrective action program was effective at identifying, evaluating, and correcting problems. The threshold for entering problems into the corrective action program was sufficiently low. Other than minor discrepancies, no problems were identified concerning the documentation of corrective action program issues. The inspectors identified a few examples where corrective actions were unclear or incomplete or were improperly closed out to other processes. Licensee reviews of operating experience information were comprehensive. Recent root cause and apparent cause evaluations were more clear, concise, and of a higher quality than those reviewed from early 2001. The results of the last comprehensive corrective action program audits conducted by the licensee and other related audits were properly entered into the corrective action program.

The inspectors concluded that, although the significance of the problems resulting from human performance errors has decreased and the trend had improved in some departments, only moderate improvements have occurred for the entire site. Previous non-compliance issues documented as non-cited violations were properly tracked and resolved via the corrective action program. Based on discussions with plant personnel and the apparent low threshold for items entered in the corrective action program database, the inspectors concluded that personnel at the site felt free to raise safety concerns to their management.

Report Details

4. OTHER ACTIVITIES

4OA2 Identification and Resolution of Problems

a. Effectiveness of Problem Identification

(1) Inspection Scope

The inspectors reviewed Problem Investigation Process (PIPs) reports, which served as the licensee's formal means of documenting equipment and human performance problems, concerns, issues, and events. The review was primarily focused on five risk significant systems to assess licensee actions associated with problem identification and resolution. The five systems were: High Pressure Injection (HPI), Low Pressure Injection (LPI), Emergency Feedwater (EFW), Low Pressure Service Water (LPSW), and DC Power systems. The inspectors walked down assessable areas for the five systems and other areas of the plant with the responsible system engineer to view system and component condition and to determine if deficiencies existed that had not been entered into the corrective action program (CAP). The inspectors also reviewed other CAP documents including completed corrective actions documented in PIPs and operating experience program (OEP) documents to verify that industry-identified problems potentially or actually affecting Oconee were appropriately entered into and resolved by the formal CAP process. Items included in the OEP effectiveness review were NRC Information Notices (IN), industry or vendor-generated reports of defects and noncompliance under 10 CFR 21, and vendor information letters (VILs). A detailed listing of PIPs, OEP, licensee procedures, and documents that were reviewed during this inspection is included in the Attachment of the report.

The inspectors also reviewed operating logs, maintenance rule functional failure list, system health reports, and the Technical Specification (TS) Limiting Condition for Operation entry list to determine if deficiencies were being properly entered into the CAP. The inspectors attended daily management focus meetings, department meetings, and PIP screening meetings that assessed the significance and determined the level of evaluation required for recent plant issues. The inspectors also attended one Corrective Action Review Team meeting to determine whether longer term plant issues were being properly reviewed and whether the appropriate level of management attention for significant and potentially significant plant issues was being recommended. During all of the above inspection activities, the inspectors also assessed whether licensee management was providing an independent review of significant plant issues, as well as providing oversight to the plant on potential cross cutting industry issues and adverse trends. Self assessments, audits, trend reports, and management and supervisor observation documents were reviewed to assess the effectiveness of problem identification and documentation.

The inspectors discussed issues identified during the PIP reviews with various system engineers, maintenance personnel, procedure writers, and other plant personnel to determine if the corrective action system was effective for identifying and tracking Conditions Adverse to Quality (CAQs).

(2) Findings

.1 General

In general, the licensee's threshold for entering problems into the corrective action program was appropriate and in accordance with licensee procedures. The inspectors did not identify plant equipment problems or industry-related issues that had not been entered in the CAP. Based on the total number of PIPs generated at the Oconee site each year (5000-6000), the observed low threshold for documenting issues, and discussions with plant personnel, the inspectors concluded that the licensee's corrective action program was being effectively implemented for problem identification. This conclusion was based on a review of over 150 selected licensee initiated PIPs and other CAP related documents.

.2 Review of Human Performance Trends

The licensee conducts quarterly trends of the most significant cause and event codes identified in PIPs. Trend results were entered into the CAP through PIPs and resulted in actions for affected departments to review trend results and take appropriate corrective actions.

A negative observation was identified regarding a continuing adverse trend in human performance errors during a previous NRC Problem Identification and Resolution inspection. During this inspection, the inspectors reviewed the licensee's human performance trend reports and analysis and human performance PIPs initiated since about February 2001, to assess overall performance and corrective actions. The licensee completed self-assessment SA-01-71(ON)(NPAS)(PreINPO), in October 2001, and highlighted similar human performance deficiencies that had previously identified during other licensee assessments. The licensee initiated PIP O-01-04265 to address these recent deficiencies. Additionally, the licensee initiated several other programmatic initiatives for corrective actions to improve human performance. The initiatives included: reactivating the inactive Human Performance Steering Committee; improving the Management and Group Supervisor Observation Programs, focusing on procedure usage and compliance; changing reference use procedures to continuous use procedures as needed; providing additional human performance related training to supervisors and managers; conducting a formal quarterly assessment of human performance; and performing site and management error common cause analysis.

During this inspection, the inspectors reviewed a number of PIPs related to recent events and noted that human performance errors continued to occur, both in procedure accuracy and in adherence to procedures. The inspectors noted that some of the licensee's initiatives were only recently started and the effectiveness may not be fully realized.

The inspectors concluded that although the significance of the problems resulting from human performance errors has decreased and some improvements were observed for specific departments, the overall site wide negative trend for human performance showed only modest improvement. This was evidenced by recent licensee assessments

and trend reports. Licensee management was aware of the trend, was providing increased oversight, and was continuing to monitor the results of the recent initiatives.

b. Prioritization and Evaluation of Issues

(1) Inspection Scope

The inspectors reviewed PIPs that were assigned various Action Categories to determine whether issues were properly prioritized in accordance with licensee procedure NSD 208, Problem Investigation Process. The Action Categories (1 through 4) were defined in NSD 208 and were numbered based on decreasing significance. Action Category 1 PIPs are “significant” CAQs that required formal root cause evaluations. Action Category 2 PIPs are defined as CAQs for which management could use its discretion in deciding whether to perform a formal root cause evaluation. Action Category 3 PIPs are problems for which an “apparent cause” analysis is sufficient to correct the immediate problem. Action Category 4 PIPs are low level CAQs or conditions not adverse to quality, neither of which required any type of causal evaluation. The majority of the reviewed PIPs were screened as Action Category 3, with the remainder falling into Action Categories 1, 2, and 4. The inspectors reviewed condition reports to determine if they were properly classified based on the licensee’s definition of “significant” from procedure NSD 208.

The inspectors reviewed a sample of potentially significant and routine corrective action documents to determine whether the licensee found the appropriate causes, identified corrective action to prevent recurrence (including common cause and generic concerns), and completed the corrective actions.

(2) Findings

In general, the licensee’s threshold for prioritization and evaluation of problems in the corrective action program was satisfactory. In addition, the inspectors noted that the technical adequacy and depth of the evaluations, as documented in the corrective action program, were generally acceptable. The inspectors did not find any risk significant issues that had not been appropriately prioritized and evaluated.

However, a few PIP issues were categorized at a level which may have impacted the responsive and thoroughness of the assigned actions. For example, there were five PIPs (O-01-01254, O-01-01791, O-01-02396, O-01-02584, O-01-04001) initiated between April and November, 2001, concerning grounds on the 125 VDC systems. Four PIPs were classified as Action Category 4 and one was classified as Action Category 3. The Action Category 3 PIP was initiated after four grounds occurred within a 24 hour period. These four grounds were different grounds than those captured in the Action Category 4 PIPs. The problem evaluation of the Action Category 3 PIP restated the circumstances surrounding the four grounds that occurred within the 24 hour period and documented that the purpose of the PIP was to serve only as a tracking and trending data point and no further action was required. The inspectors noted that there was no integration review of the five PIPs and no development of a problem evaluation to fully understand the apparent cause of the grounds.

Root cause evaluations and corrective actions were generally effective to prevent recurrence. The inspectors noted that where issues recurred, the Plant Issue Review Team meetings evaluated them for potential repetitive or common mode issues within the CAP and assigned the appropriate level of root cause evaluation. The inspectors observed that the more recent root cause and apparent cause evaluations were more clear, concise, and of a higher quality than those reviewed from early 2001.

Based on the total number of PIPs with root cause evaluations that were reviewed, the inspectors concluded that the licensee's corrective action program was generally effectively for prioritizing and evaluating problems.

c. Effectiveness of Corrective Actions

(1) Inspection Scope

The inspectors reviewed PIPs to assess the licensee's actions to determine causal factors, to develop and implement appropriate actions to correct the adverse condition, and, if significant, prevent recurrence. These PIPs were primarily related to cornerstones in the Reactor Safety and Radiation Safety strategic performance areas of the NRC inspection program. PIPs associated with past non-cited violations (NCVs) were reviewed to verify that the associated problems were corrected.

The inspectors reviewed industry operating experience (OE) issues that were evaluated in the past two years to determine if this information had been appropriately assessed for applicability to the station and whether applicable issues were incorporated into the CAP. Items reviewed under the OE categorization included: Vendor Information Letters (VILs), NRC Information Notices (INs), Licensee Event Reports, and NRC Regulatory Issue Summaries (RISs).

The inspectors also performed sample reviews of long-term open CAP issues, the licensee's rationale for deleted PIPs, and issues documented in NRC inspection reports to verify licensee actions were in accordance with site procedures and regulatory requirements. A follow-up review was conducted on the status of the licensee's Emergency Operating Procedure (EOP) Corrective Action Program to assess completion progress. For further insight into potential problems, CAP entries were discussed with the resident inspectors who routinely evaluated these activities as part of the NRC baseline inspection program.

The inspectors review of licensee's actions with respect to declining pressurizer heater performance included a review of CAP documents, assessments, evaluations, and discussions with engineering personnel.

In addition, the inspectors interviewed plant personnel directly involved with the CAP, as well as those cognizant of specific technical issues, to verify and understand corrective actions associated with those items reviewed. Licensee documents reviewed during this inspection are listed in the Attachment to the report.

(2) Findings

.1 General

The licensee's process for screening and evaluating both internal and external OE issues was well established and adequately addressed the issues as they related to Oconee. OE evaluations were for the most part complete, with only minor problems in the thoroughness of some evaluations and in establishing the applicability of potential problems at Oconee.

In general, PIPs associated with NCVs adequately addressed the associated problems. The majority of the sampled corrective actions (CAs) identified and implemented by the licensee were effective in addressing the root causes of the problems.

The inspectors identified a few examples where CAs were unclear, incomplete, or were improperly closed out to other processes. For example:

CA 3 for PIP O-01-03753, stated to revise procedures to include actions to operate certain LPSW system valves in the event of a loss of instrument air. This CA was not accepted by the operations department and was closed on December 13, 2001. There was no explanation for why the CA was not accepted or what actions needed to be taken. Also, two additional CAs were identified for completion once operations had revised the procedures. The due date for the two additional CAs was March 6, 2002, and no actions had been completed. The inspectors informed the licensee who immediately corrected the problems.

CA 9 of an open Action Category 2 PIP, O-99-01531, was closed to the minor modification process with no further action required. The licensee's CAP specifies that CA for Action Category 2 PIPs should not be closed to other processes and should remain open until corrective actions are completed. In this case the minor modification was not completed. The inspectors informed the licensee who immediately corrected this problem and reopened the CA.

.2 Review of Pressurizer Heater Problems

An Unresolved Item (URI) was opened to determine the safety significance associated with the pressurizer heaters, when powered from the Safe Shutdown Facility (SSF), not having sufficient capacity to assure natural circulation in the Reactor Coolant System (RCS). This conditioned affected all three units.

On February 2, 1999, a concern was documented in PIP O-99-00405 on the required pressurizer heater capacity and how many heaters were required to assure natural circulation from the SSF. The PIP referred to a 1988 safety-related calculation, OSC-3144, Pressurizer Heater Rejection, which determined that 70 kW of SSF powered heater capacity was sufficient to overcome ambient heat losses and assure that natural circulation can be maintained. However, PIP O-99-00405 raised a number of questions regarding pressurizer heater capacity such that the licensee determined additional actions were needed. CA 6 of the PIP O-99-00405 stated that to determine pressurizer heater capacity needed to make up for pressurizer ambient heat losses, the pressurizer

spray valve (RC-1) should be replaced (due to valve seat leakage). CA 9 of the PIP stated that after valve RC-1 is replaced a test should be performed at a suitable time to determine pressurizer ambient heat losses and validate the conclusions of calculation OSC-3144. Based on a thermal transient assessment, engineering personnel concluded that the pressurizer spray valves should not be closed during operating conditions. Therefore, the pressurizer ambient heat loss test would need to be conducted with the plant shutdown.

The inspectors determined that actions to perform the pressurizer ambient heat loss test were not timely. The Unit 3 spray valve was replaced during an April 2000 refueling outage. The licensee had two opportunities to perform the heat loss test, in April 2000 after the spray valve was replaced and later during the Unit 3 November 2001 refueling outage.

There were several other PIPs and issues dealing with pressurizer heater problems that presented additional opportunities for the licensee to investigate and understand overall heater performance. These included:

- PIP O-00-02050, dated May 27, 2000, documented a deficiency where RCS pressure was cycling below the minimum limit of 2125 psig. The apparent cause for this problem was a gradual increase of required kW needed by pressurizer heaters to maintain equilibrium of the RCS. Pressurizer heater requirements are based upon ambient losses, pressurizer spray and spray bypass flow due to degradation of the bypass spray valves, and insulation material conditions. The licensee recognized that the pressurizer heaters kW demand had increased such that the normal controlling bank (bank 1) could not maintain the setpoint of 2155 psig for the RCS. Data collection provided evidence that the controlling pressure of the RCS has decreased over time since late 1980. This PIP contained two CAs. One CA initiated increased monitoring of pressurizer pressure, while the second CA was to evaluate long term actions necessary to restore pressurizer heater control to bank 1 modulating heaters. The second CA was closed out to PIP O-01-00366 with a due date of June 6, 2001. This PIP identified that the heater reconfiguration could be performed after completion of the pressurizer heat loss test. The inspectors noted that PIP O-01-00366 resulted in no corrective action and was closed out to PIP O-01-01860 with a new due date of May 15, 2002.
- PIP O-01-01860 dated May 17, 2001, documented the results of an RCS pressure control and pressurizer heater assessment. Several of the CAs were open with 2002 due dates. CA 1 of PIP O-01-1860, was to determine the current pressurizer heat losses by performing a heat loss test for each unit. Additionally, the CA stated that if the losses were greater than current pressurizer heater configuration, the design basis for Loss Of Offsite Power (LOOP) and SSF could be impacted. The due date for this CA was May 22, 2003.
- PIP O-01-2179 dated June 6, 2001, documented that Unit 2 RCS pressure was less than the COLR requirements. Bank 1 heaters have not been functioning properly since June 2, 2001, and operators were maintaining RCS pressure by manually energizing bank 3 heaters. The licensee completed an assessment of

this problem, identified that a minor modification should be developed to change a computer alarm setpoint, and indicated that other heater problems were being addressed by PIP O-01-01860.

- PIP O-01-02730, dated July 19, 2001, documented that the pressure control function of the RCS (pressurizer heaters) was placed in Maintenance rule (a) (1) status due to repetitive failures. The licensee completed an assessment of this problem with respect to the Maintenance Rule.

On March 7, 2002, the licensee determined the pressurizer ambient heat losses were greater than the capacity of the SSF powered pressurizer heaters based on calculated heat losses. The licensee determined that an actual heat loss test was not required and that the losses could be calculated based on current plant data. The calculated losses were 143 kW for Unit 1, 149 kW for Unit 2 and 178 kW for Unit 3. This was significantly greater than the assumed 70 kW ambient heat loss in the original design basis documents. The licensee determined that with the ambient heat losses greater than pressurizer heater capacity, single phase RCS natural circulation could be interrupted due to voiding in the hot leg with the existing procedure guidance. Consequently, the SSF auxiliary service water function (remove reactor decay heat via the steam generators) was declared inoperable. The licensee issued PIP O-02-01066 to document this problem. The NRC initiated a Special Inspection Team to review and assess the degraded condition of the SSF. Details of that inspection are documented in NRC Inspection Report 50-269, 270, 287/02-08. The inspectors determined that prompt actions were not taken to resolve the concern of pressurizer heater capacity that was identified in February 1999 and that the requirements of 10 CFR Appendix B, Criteria XVI, Corrective Action, were not satisfied. Final disposition of this corrective action issue is pending the risk significance determination for the lack of adequate pressurizer heater capacity. This issue is identified as Unresolved Item (URI) 50-269, 270, 287/02-06-01: Review Corrective Actions Related to Pressurizer Ambient Heat Losses Exceeding Pressurizer Heater Capacity from the Safe Shutdown Facility.

.3 Effectiveness of Emergency Operating Operating (EOP) Corrective Action Program

A negative observation had been identified concerning the progress of the licensee's EOP Corrective Action Program during the last Problem Identification and Resolution inspection. The inspectors previously concluded that the program was progressing slowly in validating time critical operator actions. During this inspection, the inspectors noted that the licensee had nearly completed the validation of time critical operator actions that were needed to mitigate potential events. The list of time critical operator actions has been included in Design Basis Specification for Design Basis Events, OSS-0254.00-00-4005. The inspectors noted that the current list included 43 time critical operator actions, of which, the licensee had successfully validated 42 actions. Validations involved performance of the actions on the plant simulator and simulated actions in the plant to assure that operators could perform the actions correctly and within the required times. One time critical operator action had been added recently and therefore had not been validated at this time. The validated sequences were included in operating procedures that had recently been rewritten into a two column format.

The inspectors concluded that the licensee's EOP Corrective Action Program was still identifying time critical operator actions and was validating them in a timely manner.

d. Effectiveness of Self-Assessments and Audits

(1) Inspection Scope

The inspectors reviewed selected licensee audits and self-assessments of problem identification and resolution to determine whether they were consistent with NRC findings. The licensee typically assessed the CAP by completing at least four different assessments, one in each of the four major areas of the CAP. The areas assessed included 1) problem identification and screening, 2) cause/problem evaluation, 3) corrective action and corrective action effectiveness, and 4) trending of problem investigation. The inspectors reviewed the licensee's most recent comprehensive self-assessment for three of the four areas to determine if findings and recommended areas for improvement were being entered into the licensee's CAP and if appropriate corrective actions were taken to resolve identified CAQs or program deficiencies. The following major assessments were reviewed: SA-01-26(ALL)(RA), May 7 through June 14, 2001; SA-01-27(ALL)(RA), August 20 through September 13, 2001; and SA-01-28(ALL)(RA), October 22-25, 2001. Licensee audits and assessments and associated PIPs reviewed by the inspectors are listed in the Attachment of the report.

(2) Findings

.1 General

Audit and self-assessment findings were consistent with the NRC conclusions. The review indicated that licensee self-assessments were thorough and effective in identifying deficiencies in the corrective action program and other programmatic areas. These deficiencies as well as areas for improvement were routinely entered into the CAP with the appropriate significance level being assigned.

.2 Review of Comprehensive Self-assessment

The inspectors reviewed the results of the licensee's recently completed self-assessment SA-01-71(ON)(NPAS)(PreINPO) that was completed in October 2001. The self-assessment included Operations, Chemistry, Radiation Protection, Maintenance, Work Management, and Engineering activities. The assessment was thorough, detailed, and effective in identifying problems. Although the assessment results did not provide an abundance of examples, the assessment identified deficiencies that had been identified during previous assessments. This included human performance items such as component mis-positioning and deficient maintenance worked practices. The inspectors noted that human performance was one of the licensee's focus areas for improvement. The inspectors verified that the licensee had initiated PIPs and entered the deficiencies identified during the self-assessment into the CAP.

e. Assessment of Safety Conscious Work Environment

(1) Inspection Scope

During this inspection, the inspectors interviewed various levels of licensee personnel to develop a general view of the safety-conscious work environment. This included personnel from all departments that perform regulated activities and the manager of the Oconee Concerns Resolution Program. The inspectors also reviewed documents associated with concerns submitted during year 2001, to assess licensee actions to resolve the concerns.

(2) Findings

The inspectors did not identify any reluctance to identify safety concerns. The Concerns Resolution Program was actively communicated to employees and was assessed for effectiveness by licensee management.

4OA6 Management Meetings

Exit Meeting Summary

The inspectors presented the inspection results to Mr. W. McCollum, Site Vice President, as well as other members of licensee management and staff on March 21, 2002. Subsequently, on April 4, 2002, the additional inspection results were presented to Mr. L. Nicholson, Regulatory Compliance Manager. The licensee acknowledged the findings presented.

The inspectors asked the licensee whether any of the material examined during the inspection should be considered proprietary. No proprietary information was identified.

SUPPLEMENTAL INFORMATION

PARTIAL LIST OF PERSONS CONTACTED

Licensee

S. Batson, Mechanical/Civil Engineering Supervisor
R. Bond, Safety Review Manager
S. Capps, Primary Systems Engineering Supervisor
D. Coyle, Operations Support Manager
G. Davenport, Balance of Plant Systems Supervisor
W. Foster, Safety Assurance Manager
B. Hamilton, Engineering Manager
B. Jones, Training Manager
R. Jones, Station Manager
W. McCollum, Site Vice President, Oconee Nuclear Station
J. Smith, Regulatory Compliance
P. Stovall, Operations Training Manager
J. Weast, Regulatory Compliance

ITEMS OPENED AND CLOSED

Opened

50-269, 270, 287/02-06-01 URI (URI) 50-269, 270, 287/02-06-01: Review Corrective Actions Related to Pressurizer Ambient Heat Losses Exceeding Pressurizer Heater Capacity from the Safe Shutdown Facility (Section 40A2.c.(2).2) .

LIST OF DOCUMENTS REVIEWED

Licensee Procedures

Nuclear System Directive: 203	Operability, clear System
Nuclear System Directive: 204	Operating Experience Program (OEP) Description
Nuclear System Directive: 208	Problem Investigation Process (PIP), 03/14/02
Nuclear System Directive: 210	Corrective Action Program
Nuclear System Directive: 212	Cause Analysis
Nuclear System Directive: 223	Trending Of PIP Data
Nuclear System Directive: 602	Employee Concerns Program
Engineering Directive Manual: 210	Engineering Responsibilities for the Maintenance Rule
PT/2/A/0600/013	Motor Driven Emergency Feedwater Pump (MDEFWP) Test
IP/0/A/0275/006 C	Safety Related Functional Test of the MDEFWP and TDEFWP Initiation Pressure Switches and Cooling Water Valves

Drawings

OFD-102A-2.1	Borated Water Supply and LPI Pump Suction
OFD-102A-3.2	LPI Pump Discharge
OFD-124B-1.3	LPSW - Reactor Building Ventilation Cooling
OFD-124A-3.1	LPSW - Low Pressure Service Water Pumps

Licensee Documents

MDEFWP Cable Installation Data 2EPTE1501	March 18, 2002
MDEFWP Cable Installation Data 2EPTE1506	March 18, 2002
Terminal Box Cable Installation Data 2EPTE1507	March 18, 2002
Switchgear 2TE Cable Installation Data 2EPTE1508	March 18, 2002
Switchgear 2TE Cable Installation Data 2EPTE1509	March 18, 2002
Safety Review Group Monthly Reports , September, October, and November 2001	
Operations Trend Report, Q1, 2001	

PIPS

O-93-00869	Oxidation of internal wiring in Westinghouse protective relays
O-94-00012	Review of IN 91-20 for applicability to Keowee
O-95-00013	Control Battery 2CB capacity 77%
O-95-00288	Battery 3CA capacity 77.97%
O-97-01050	MCC starters designated A1 under Maintenance Rule
O-98-00716	Green slime present in control cabinet of transformer CT5
O-98-01634	Dissimilar Metals in Filtered Water (FW) System
O-98-02985	Drain Line from 10 inch FW Header broke off
O-98-04145	Protective relays designated A1 under Maintenance Rule due to green slime
O-98-04345	LPSW system is Maintenance Rule A1 due to inadequate testing of LPSW-67 and LPSW-68
O-98-04115	PIP issued following NRC Maintenance Rule Inspection
O-98-04781	PIP issued following review of Significant Operating Experience Report 98-1
O-98-05211	FW Valve Found Disengaged From its Nipple
O-99-01339	FW Valve Nipple Thread Failure
O-99-01531	FW System in Maintenance Rule (a) (1)
O-99-03246	2FDW-315 indicated throttled open, should be closed
O-99-04132	Oxygen monitor out of service
O-99-04193	Not performing post maintenance testing after racking breakers to normal position
O-00-00461	While performing HPSW pump test chiller B tripped
O-00-00686	Cables Damaged From Excessive Heat from Light Fixture
O-00-00747	4160 VAC in Maintenance rule (a) (1) Conduct a review and monitor Maintenance Rule components
O-00-00766	Inadequate Warming Line Flow
O-00-00854	1LP-9 failed to open when operated from the control room
O-00-00921	600/208 VAC in Maintenance Rule (a) (1)
O-00-00933	All three units in TS 3.0.3 Due to Failure of Both Chillers
O-00-01759	2LPSW-21 failed to operate from ES channel 5 during testing

O-00-02785	2XUB motor control center failed to swap
O-00-02927	SSF pump oxygen monitor out of service
O-00-03016	SSF battery low voltage
O-00-03593	Primary IA compressor failed to maintain header pressure
O-00-04563	Valve 1RC-67 as found set pressure outside acceptance criteria
O-01-00078	Pump Tripped on Low Oil Pressure and Could Not Throttle Discharge Pressure
O-01-00120	Problems with Establishing Warming Line Flow
O-01-00157	Core flood tank line break with operator action to trip RCPs at 2 minutes was not previously evaluated for 1 HPI pump at 75% power
O-01-00180	Heater bank 1 pressurizer heater control problems
O-01-00432	LPI single failure analysis identified a vulnerability associated with LP-104 failing to close after failure of certain power supplies
O-01-00455	Inappropriate Use of 50.59 Process
O-01-00481	Lubrication sample from 1B LPI pump discolored
O-01-00651	Cables for H2R 115A found damaged
O-01-00659	Foreign Material Found in Valve 3HP-66
O-01-00837	NLO Finds Cracked Control Power Fuse Block
O-01-00887	1CA Battery Cell Low Specific Gravity
O-01-00953	Connector on hydrogen recombiner found loose
O-01-00956	CRD breaker not covered in PIP to address industry good practice following breaker rack out
O-01-00975	Failure of Flow Transmitter 1HPIFT0185
O-01-00989	Found Water Residue and Corrosion Inside Transmitter 1HPI-FT-0185
O-01-01071	Unexplained Decrease in LDST Level
O-01-01099	Control battery 1CA inoperable due low pilot cell voltage
O-01-01193	Battery cell leaking
O-01-01225	No Clearly Defined Basis For Operations Shift Staffing for Tornado
O-01-01254	Unit 3 DC Ground
O-01-01382	Problems with Warming Line Flow on Unit 3 Startup
O-01-01496	1A LPI pump sample indicates metal in oil
O-01-01518	Design Change Identified at McGuire on Rotork Valves, OEDB 01-027494
O-01-01633	Unit 3 RCS pressure decreased below COLR limits
O-01-01674	Metal Shavings in 2A HPI Pump
O-01-01791	125 VDC Ground
O-01-01825	2LP-10 would not go closed when operated from control room
O-01-01968	Assessment of OE item IN 2001-06, Failure of Charging Pump at Shearon Harris
O-01-01980	3FDW-316 open with greater than 30 inches in 3B OTSG
O-01-02076	SSF Air conditioner air flow rate outside rounds limits
O-01-02179	Unit 2 RCS pressure decreased below COLR limit
O-00-02321	Chilled Water System Loads in Maintenance Rule (a) (1)
O-01-02396	DC System Ground
O-01-02433	Light corrosion on battery post
O-01-02584	Power Battery Ground
O-01-02646	FDW-315, FDW-316 power supplies designated (a) (1) under Maintenance Rule
O-01-02651	LPSW pump strainer dP recorded at incorrect flow rate
O-01-02668	DCSFS charger low and high voltage relays will not adjust

O-01-02821	DCSFLV low voltage trouble alarm
O-01-03082	Problem with battery ground test switch
O-01-03084	SSF battery temperature below round sheet value
O-01-03178	"A" Chiller Failed to Start
O-01-03483	Lake level instrument out of service
O-01-03497	A number of configuration control issues
O-01-03588	Inadequate fire brigade coverage
O-01-03600	Review Of OE Item for Tagout of Potential Transformers Potentially Applicable to Oconee
O-01-03753	Potential Operability Issue Identified in a Calculation (Control Room Cooling System)
O-01-03838	SSF Battery Cell Low Specific Gravity
O-01-03929	SEN 223 Service Water Strainer Failure Potentially Applicable to Oconee
O-01-03945	SSF oxygen monitor out of range
O-01-03953	Inconsistent Guidance on functional testing of 4160 breaker rack out
O-01-03984	K-1 battery voltage rating slightly lower than 141.4 VDC
O-01-03994	Emerging trend for near miss incidents caused by maintenance
O-01-04000	1HP-16 Failed Valve Stroke Test/ Unplanned Entry into SLC 16.5.13
O-01-04001	125 VDC Ground
O-01-04007	1B LPSW pump packing leaks
O-01-04040	Diesel air compressor powered by drop cord
O-01-04192	Water hammer occurred in FDW line
O-01-04204	Drawing discrepancy concerning pressurizer heater penetration
O-01-04217	3A LPI pump inboard horizontal bearing vibration was not in acceptable range
O-01-04284	Found green slime on RCP 3B1 46 relay
O-01-04457	LPSW-68 did not open during testing
O-01-04481	2B LPI train declared inoperable due to inadvertent actuation of declutch lever
O-01-04791	Localized cracking in concrete near embedded plate
O-01-04864	Degraded/nonconforming supports on Unit 3 RCP heat exchanger relief valves
O-01-04882	While tripping CRD breaker 11 Unit 3 CRD breaker 10 also tripped
O-01-04948	Fibrous material found on electrical cables
O-01-04970	Weld made with two types of filler material
O-01-05010	No certification for penetrant material used on welds
O-01-05060	Problems with Reach Rod Operated Valves in HPI System
O-01-05284	Battery 3CA Low Specific Gravity
O-02-00128	DCSFS Battery Cells Low Specific Gravity
O-02-00399	Sample pump would not start after filter change
O-02-00777	Battery Room Low Temperature
O-02-00892	GE 10CFR Part 21 Notification Regarding Cutoff Switches on Certain Breakers
O-02-00916	KSF-2 Inverter fan failed after placing in service following PM

Audits and Assessments (PIPs)

O-00-00764	Site wide trend for procedure inaccuracy's
O-01-00587	Operability assessment for continued operation following apparent RCS breach
O-01-00814	Engineering group self assessment -management expectations
O-01-01112	Radiation protection 2001Q1 self assessment-manning
O-01-01299	Periodic assessment of operability PIPs
O-01-01326	Review actions and plans for control room chiller performance
O-01-01402	1B Motor Driven Emergency Feedwater Pump Outboard Motor Bearing Failure
O-01-01467	Adverse trend for mis-positioning in chemistry
O-01-02111	Trending of safety related tagging PIPs following CNS NSRB
O-01-02367	Operations assessment of human performance
O-01-02921	Apparent trend in deferred work activities
O-01-03200	An emerging trend for equipment out of tolerance
O-01-03684	SRG/INOT Assessment of the Use of Lower Tier Programs versus PIP Program
O-01-03782	Assessment SA-01-027, corrective actions not timely
O-01-03781	Assessment SA-01-027, corrective actions closed to inappropriate process
O-01-03784	Assessment SA-01-027, corrective action - area for improvement
O-01-03974	Adverse trend in number of PIPs due to vendor manufacturing deficiencies
O-01-04265	Assessment SA-01-71, areas for improvement plant wide
O-01-04901	Group assessment on PIP corrective action quality and timeliness
O-01-05106	Review plant performance following NSRB meeting
O-01-05259	NSD Corrective action assessment for Operations
O-01-05322	NSD 607 required effectiveness review 2000Q2 through 2001Q1
O-02-00012	Maintenance assessment of maintenance department corrective actions
O-02-00843	ONS needs to review intersystem LOCA valves not operating properly

Operability Assessment/Root Cause

O-99-01531	FW System goes to maintenance Rule (a) (1)
O-99-05270	3HP-14 Valve Stem/ Motor Coupling Fails
O-99-05278	3HP-14 Failed in Bleed Position
O-00-00933	All Three Units Entered TS 3.0.0 due to Failure of Both Chillers
O-01-00768	Seismic Qualification of Hydrogen and Nitrogen Lines Attached to the LDST
O-01-00975	Failure of Flow Transmitter 1HPIFT0185
O-01-01044	Problem with Motor Driven Emergency Feedwater Pump Recirc Flow Gage Snubbers
O-01-01467	Adverse Trend for Component Mis-positioning Events
O-01-02271	Review of PIPs 99-05270 and 99-05278, Classified HP-14 MR a(1)
O-01-02921	Apparent Trend in Work Activities Being Deferred
O-01-03139	Evaluation of HPI Pumps in High Temperature Environment
O-01-03379	Time Critical Operator Actions For EFW During MSLB/LOOP
O-01-05095	Leakage Past 3HP-211, Containment Isolation Valve

O-01-05128 LPI system Leakage Found During Performance Test
 O-02-00747 2B HPI Pump Exhibiting Increased Vibration Levels

Non-Cited Violation (NCV) (PIPs)

NCV 01-02-01 Failure to remove ground strap from safety-related bus 2TD
 (O-01-01721)

NCV 01-02-02 3B RBCU was inoperable for greater than allowed by TS
 (O-01-00786)

NCV 01-03-01 Failure to follow procedure results in Unit 2 exceeding
 (O-01-02127) licensed power level

NCV 01-04-02 Inadequate procedure for stroke time testing of EFW control valves
 (O-01-04936)

NCV 01-04-03 Failure to perform corrective actions to address an inadequate TS
 (O-01-05117) required containment valve position verification surveillance procedure

NCV 01-04-04 Failure to perform adequate radiological surveys
 (O-01-05007)

NCV 01-08-08 Inadequate corrective actions led to inadvertent RCS level decrease
 (O-01-01140)

NCV 01-09-02 Failure to ensure control room doors would open to relieve pressure
 (O-01-03662)

System Health/Trend Reports

Corrective Action Program	2001Q1
Corrective Action Program	2001Q3
Corrective Action Program	2001Q4
Maintenance Work Trend	2001Q3
Maintenance Work Trend	2001Q3
Low Pressure Service Water	2001Q4
Low Pressure Injection	2001Q4
Protective Relays	2001Q4
SSF AC and DC Power	2001Q4
Vital AC and DC Essential Power	2001Q4
230 KV Switchyard DC Power	2001Q4
RCS (pressurizer heaters)	2001Q4

Operating Experience Program Documents

OEDB 91-004704 NRC Information Notice No. 91-20, Electrical wire insulation
 degradation caused failure in a safety-related motor control center

OEDB 01-026704 OE11810-Safety Injection Hot Leg Injection Line Air Void

OEDB 01-026720	OE11740-Inadvertent Lifting of Low Temperature Overpressure Protection Relief Valve
OEDB 01-026731	OE11813-Transport Time to Radiation Monitor During SGTR
OEDB 01-026875	Ingersoll-Dresser Pump Co-Vendor Notification #37703
OEDB 01-026908	OE11896-Test Instrument High Input Impedance Causes Non-Linearity in Transmitter
OEDB 01-026995	OE11935-Failure of Actuator Spindle on Auxiliary Feedwater Pump Turbine Stop (T&T) Valve
OEDB 01-027158	OE12001-Felt Plugs found in Replacement Steam Generator Tubes
OEDB 01-027270	OE12076-Gas Binding of High Head Safety Injection Pump due to Accumulator Nitrogen Backleakage
OEDB 01-027494	VIL-O-Vendor Information Letter, Rotork Actuator NAI Terminal Block Design Change
OEDB 01-027496	OE12211-Cutler-Hammer Control Switch Failures
OEDB 01-027576	OE12257- RCS Leak at Fort Calhoun Station
OEDB 01-027594	NRC Information Notice 2001-06, Centrifugal Thrust Bearing Damage Not Detected Due to Inadequate Assessment of Oil Analysis Results and Selection of Pump Surveillance Points
OEDB 01-027654	OE12293 - Inadvertent Digital Alarming Dosimeter Set-Up Results in Dose Above Intended Setpoint
OEDB 01-027693	OE12318-Feedwater Transient Results in Core Power Exceeding Licensed Limit
OEDB 01-027971	OE12476- Emergency Response Organization Notification Failure due to Unknown Dialogic Failure Mode upon Loss of Power
OEDB 01-028119	RIS 2001-16, Update of Evacuation Time Estimates
OEDB 01-028389	OE12724-Inadequate Safety Tagout For Potential Transformer Maintenance
OEDB 01-028584	SEN 223, Debris in Essential Service Water System Results in Low Cooling Water Flow to all Emergency Diesel Generators
OEDB 01-028943	RIS 2001-23, Resetting Fault Exposure Hours for Safety System Unavailability Performance Indicators
OEDB 01-029013	OE13063-Emergency Diesel Generator Cooling Water Pressure Switch Polyimide
OEDB 02-029173	IN 2002-04, Wire Degradation at Breaker Cubicle Door Hinges