UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
245 PEACHTREE CENTER AVENUE NE, SUITE 1200
ATLANTA, GEORGIA 30303-1257

January 31, 2011

Mr. T. Preston Gillespie, Jr.
Site Vice President
Duke Energy Carolinas, LLC
Oconee Nuclear Station
7800 Rochester Highway
Seneca, SC 29672

SUBJECT: OCONEE NUCLEAR STATION - NRC INSPECTION PROCEDURE 95002 SUPPLEMENTAL INSPECTION REPORT 05000269/2010009, 05000270/2010009, AND 05000287/2010009 AND ASSESSMENT FOLLOW-UP LETTER

Dear Mr. Gillespie:

On December 17, 2010, the U. S. Nuclear Regulatory Commission (NRC) completed a supplemental inspection pursuant to Inspection Procedure (IP) 95002, "Inspection for One Degraded Cornerstone or Any Three White Inputs in a Strategic Performance Area," at your Oconee Nuclear Station, Units 1, 2, and 3. The enclosed inspection report documents the inspection results which were discussed at an exit meeting on December 17, 2010, with you and other members of your staff.

As required by the NRC's Reactor Oversight Process Action Matrix, this supplemental inspection was performed because a finding of Yellow safety significance was identified which placed Units 1, 2, and 3 in the Degraded Cornerstone Column during the 1st quarter of 2010. This finding, and an associated finding of White safety significance, was previously documented in NRC Inspection Report 05000269/2010008, 05000270/2010008 and 05000287/2010008. The NRC staff was informed on November 12, 2010, of your staff's readiness for this inspection.

The objectives of this supplemental inspection were to provide assurance that (1) the root causes and the contributing causes for the risk-significant issues were understood, (2) the extent-of-condition and extent-of-cause of the issues were identified, and (3) corrective actions were or will be sufficient to address and preclude repetition of the root and contributing causes. This inspection also included an independent NRC review of the extent-of-condition and extent-of-cause for both of these findings and an assessment of whether any safety culture component caused or significantly contributed to these findings. The inspection consisted of examination of activities conducted under your license as they related to safety, compliance with the Commission's rules and regulations, and the conditions of your operating license.

The inspectors determined that your staff performed a comprehensive evaluation of both findings. Your staff's evaluation of the Yellow finding identified the primary root causes to be inadequate selected strainer design and a letdown line valve design deficiency. Your staff's evaluation of the White finding identified the primary root causes to be (1) failure to identify all failure mechanisms, (2) inadequate management oversight, (3) management failed to demonstrate a commitment to achieving a high level of conservative decision-making with safety as the overriding priority, (4) management failed to provide necessary resources, (5) corrective action program weaknesses, and (6) corrective action program was improperly implemented in response to the initial SSF letdown line events.

Based on the results of this inspection, both the Yellow finding and associated White finding are closed. As a result, the NRC determined the performance at Oconee Units 1, 2, and 3 to be in the Licensee Response Column of the Reactor Oversight Process Action Matrix as of January 1, 2011. In addition, two NRC-identified findings of very low safety significance (Green) were identified which were determined to involve violations of NRC requirements. However, because of the very low safety significance and because they were entered into your corrective action program, the NRC is treating the findings as non-cited violations (NCVs) consistent with the NRC Enforcement Policy. If you contest these NCVs, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington DC 20555-0001; with copies to the Regional Administrator, Region II; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at the Oconee facility. In addition, if you disagree with the cross-cutting aspects assigned to the findings in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the Regional Administrator, Region II, and the NRC Resident Inspector at Oconee.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of the NRC's document system, Agency wide Documents Access and Management (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/

Jonathan Bartley, Chief
Reactor Projects Branch 1
Division of Reactor Projects

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

Enclosure: Inspection Report 05000269/2010009, 05000270/2010009, and 05000287/2010009
w/Attachment: Supplemental Information

cc w/Encl: (See page 3)

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ADAMS: ☐ Yes ACCESSION NUMBER: ML110310551 ☐ SUNSI REVIEW COMPLETE

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Letter to Preston Gillespie from Jonathan Bartley dated January 31, 2010

SUBJECT: OCONEE NUCLEAR STATION - NRC INSPECTION PROCEDURE 95002 SUPPLEMENTAL INSPECTION REPORT 05000269/2010009, 05000270/2010009, AND 05000287/2010009 AND ASSESSMENT FOLLOW-UP LETTER

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U. S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket Nos.:	50-269, 50-270, and 50-287
License Nos.:	DPR-38, DPR-47, and DPR-55
Report Nos.:	05000269/2010009, 05000270/2010009, and 05000287/2010009
Licensee:	Duke Energy Carolinas, LLC
Facility:	Oconee Nuclear Station, Units 1, 2, and 3
Location:	Seneca, SC 29672
Dates:	December 13, 2010 through December 17, 2010
Inspectors:	T. Hoeg, Senior Resident Inspector, Lead Inspector A. Barker, Government Liaison Officer, Region III L. Suggs, Reactor Inspector T. Lighty, Project Engineer
Approved by:	Jonathan Bartley, Chief Reactor Projects Branch 1 Division of Reactor Projects

Enclosure

SUMMARY OF FINDINGS

IR 05000269/2010009, 05000270/2010009, and 05000287/2010009; 12/13/2010 - 12/17/2010; Oconee Nuclear Plant, Units 1, 2, and 3; Supplemental Inspection - Inspection Procedure (IP) 95002.

This supplemental inspection was conducted by a senior resident inspector, a government liaison officer, and two reactor inspectors. Two Green non-cited violations (NCV) were identified. The significance of most findings is indicated by their color (i.e; Green, White, Yellow, or Red) using the NRC Inspection Manual (IMC) 0609, "Significance Determination Process" (SDP). Findings for which the SDP does not apply may be Green or 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."

Cornerstone: Mitigating Systems

The NRC staff performed this supplemental inspection in accordance with IP 95002, "Inspection for One Degraded Cornerstone or any Three White Inputs in a Strategic Performance Area," to assess the licensee's evaluations associated with the inoperability of the Standby Shutdown Facility (SSF) Reactor Coolant Makeup (RCM) system on all three units. The NRC staff previously characterized this condition as having moderate safety significance (Yellow) for the SSF RCM system being inoperable for greater than the seven days allowed by Technical Specifications as documented in NRC IR 50000269, 270, 287/2010008. The licensee identified the primary root causes to be inadequate selected strainer design and a letdown line valve design deficiency. A finding of low to moderate safety significance (White) was also identified for the licensee failing to promptly identify and correct a condition adverse to quality involving foreign material (FM) on the Unit 2 and 3 SSF letdown line strainers after the condition was first identified on Unit 1. The licensee identified the primary root causes to be: (1) failure to identify all failure mechanisms, (2) inadequate management oversight, (3) management failed to demonstrate a commitment to achieving a high level of conservative decision-making with safety as the overriding priority, (4) management failed to provide necessary resources, (5) corrective action program weaknesses, and (6) corrective action program was improperly implemented in response to the initial SSF letdown line events.

As a result of NRC's conclusion that the licensee appropriately addressed the above issues, the Yellow and White findings will be considered in assessing plant performance for a total of four quarters in accordance with the guidance in IMC 0305, "Operating Reactor Assessment Program." The licensee's implementation of corrective actions will be reviewed during future inspections.

Findings

Cornerstone: Mitigating Systems

- Green. An NRC-identified Non-cited Violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," was identified for the licensee's failure to evaluate degraded or nonconforming conditions and perform operability determinations or functionality assessments as prescribed in procedure OMP 2-01, Duties and Responsibilities of On-Shift Operations Personnel. The inspectors determined that the licensee routinely

failed to evaluate known conditions adverse to quality documented in work orders and work requests for potential impact on the operability or functionality of systems, structures or components (SSC's).

The failure to evaluate work orders (WOs) or work requests (WRs) for potentially degraded or nonconforming conditions as required by OMP 2-01 was a performance deficiency (PD). This PD was more than minor because, if left uncorrected it had the potential to lead to a more significant safety concern. The failure to evaluate potential conditions adverse to quality as prescribed in OMP 2-01 could result in the licensee failing to determine that a degraded or nonconforming condition could affect the system's ability to perform its safety function. The finding was determined to have very low safety significance (Green) because the finding did not represent an actual loss of safety function of a system or train. This finding has a cross cutting aspect in the area of Human Performance associated with the component of Work Practices because licensee management failed to define and effectively communicate expectations regarding procedural compliance such that personnel follow procedures [H.4(b)].

- Green. An NRC-identified non-cited violation of 10 CFR 50.65(a)(2), was identified for failure to demonstrate that Standby Shutdown Facility (SSF) Ventilation system performance was being effectively controlled through the preventive maintenance (PM) program, or place the system in 10 CFR 50.65(a)(1) status due to SSF Heating Ventilation and Air Conditioning (HVAC) system maintenance rule functional failures beyond established performance criteria.

  The failure to perform adequate performance or condition monitoring on the SSF HVAC system was a performance deficiency (PD). This PD was more than minor because it was associated with the equipment performance attribute of the Mitigating Systems Cornerstone and adversely affected the cornerstone objective in that the licensee failed to demonstrate effective control of the SSF HVAC system through appropriate preventive maintenance. The finding was determined to have very low safety significance (Green) because it did not result in the actual loss of safety function of one or more non-Technical Specification equipment trains, designated as risk-significant per 10CFR50.65, for greater than 24 hours. The cause of the finding was directly related to the human performance crosscutting aspect associated with resources, for the licensee not ensuring their maintenance rule procedures were adequate to provide clear and accurate directions on how to classify functional failures. [H.2(c)].

REPORT DETAILS

4. OTHER ACTIVITIES

4OA3 Event Follow-up and Notices of Enforcement Discretion

(Closed) Licensee Event Report (LER) 05000269/2010-01-00 and -01, Standby Shutdown Facility Letdown Line Orifice Strainer Blocked by Valve Gasket Material

On October 11, 2009, while Unit 1 was in Mode 5, the SSF RCM system did not meet the acceptance criteria during a flow test surveillance. On October 19, 2009, the licensee determined the cause of the failed flow test was due to the letdown orifice strainer becoming blocked with FM in the form of material from a valve backseat gasket along with epoxy particles, stainless steel shavings, and paint chips. Corrective actions included removing the Unit 1 strainer. On February 18, 2010, and February 23, 2010, Unit 2 and Unit 3 SSF RCM systems, respectively, were declared inoperable due to similar FM blockage found on the letdown orifice strainers. Corrective actions included removal of the orifice strainers on Unit 2 and Unit 3. The inspectors determined the corrective actions completed and planned were adequate. On December 13, 2010, supplement LER 05000269/2010-01-01 was submitted which documented that the Unit 2 and Unit 3 SSF RCMU system letdown flow path were also affected in the same manner.

4OA4 Supplemental Inspection

.01 Inspection Scope

The inspectors performed this supplemental inspection in accordance with IP 95002 to assess the licensee's evaluation of one Yellow finding and one White finding, which affected the Mitigating Systems Cornerstone in the Reactor Safety strategic performance area. The inspection objectives were to:

- provide assurance that the root and contributing causes of risk-significant issues were understood
- provide assurance that the extent-of-condition and extent-of-cause of risk-significant issues were identified and to independently assess the extent-of-condition and extent-of-cause of individual and collective risk-significant issues
- independently determine if safety culture components caused or significantly contributed to the risk significant issues
- provide assurance that the licensee's corrective actions for risk-significant issues were or will be sufficient to address the root and contributing causes and to preclude repetition

The licensee entered the Degraded Cornerstone column of the NRC's Action Matrix in the first quarter of 2010 due to an inspection finding of moderate safety significance (Yellow). This finding was associated with the inoperability of the SSF RCM system on all three units. On October 11, 2009, the Unit 1 SSF RCM system failed a flow test surveillance. The licensee determined that a strainer in the SSF RCM letdown line had

become blocked with FM in the letdown line. The licensee subsequently determined that similar FM also existed in SSF RCM letdown lines for Unit 2 and Unit 3. This finding was characterized as Yellow based on the results of a Phase 3 risk analysis as documented in IR 05000269, 270, 287/2010008. The SSF RCM system was returned to operable after the strainer assemblies and the FM were removed from all three unit's letdown lines. Also, an inspection finding of low to moderate safety significance (White) was identified for failing to promptly identify and correct a condition adverse to quality on Unit 2 and Unit 3 once the FM was identified in the Unit 1 SSF RCM letdown line.

The licensee informed the NRC on November 12, 2010, that they were ready for this supplemental inspection. The licensee performed root cause evaluations (RCEs) for both the White (RCE PIP O-10-1213) and Yellow (RCE PIP O-09-7536) findings to identify the causes of the findings, identify appropriate corrective actions, evaluate the timeliness of the corrective actions, and to review the extent-of-the conditions. The licensee also conducted a safety culture self-assessment as part of the RCEs for these findings.

The inspectors reviewed the licensee's RCEs and other supporting documents and the corrective actions that were either taken or planned to address the identified causes. The inspectors also interviewed licensee personnel to ensure that the root and contributing causes and the contribution of safety culture components were understood and that the corrective actions taken or planned were appropriate to address the causes to preclude repetition. The inspectors also independently assessed the extent-of-condition and extent-of-cause of the findings. In addition, the inspectors performed an assessment to determine if any safety culture components caused or significantly contributed to these findings.

.02 Evaluation of the Inspection Requirements

02.01 Problem Identification

a. IP 95002 required that the inspection staff determine that the licensee's evaluation of the issue documents who identified the issue (i.e., licensee-identified, self-revealing, or NRC-identified) and the conditions under which the issue was identified

.1 Yellow Finding

The inspectors verified the licensee's RCE documented the finding as self-revealing.

.2 White Finding

The inspectors verified the licensee's RCE documented the finding as NRC-identified.

b. IP 95002 required that the inspection staff determine that the licensee's evaluation of the issue documents how long the issue existed and prior opportunities for identification

.1 Yellow Finding

The RCE documented that the SSF RCM system on all three units was vulnerable to similar flow blockage due to FM dating back to 1994. The licensee reviewed the work history for Unit 1 and determined that stainless steel particles similar to those found on October 19, 2009, could have generated when valves 1HP-424 and 1HP-426 were replaced. A review of work history from 1986 through 1998 for Unit 2 and Unit 3 determined that similar valve replacement work was performed on valves 2HP-329, 2HP-424, 3HP424, and 3HP-426 which could have introduced the stainless steel particles into the SSF letdown line.

In 2004, the licensee identified that their Foreign Material Exclusion (FME) controls in place were weak and improved their program and processes. As a result, the source of the additional debris found in the valves was considered legacy FM that was most likely already in the system prior to 2004. The licensee also found that the source of the gasket material in all three units was likely from a valve backseat gasket. Based on discussions with the vendor, the licensee determined that an apparent manufacturing defect most likely caused the material to become dislodged as discussed in LER 05000269/2010-01-01. The licensee determined that the last time the Unit 1 SSF RCM system was successfully flow tested was on May 30, 2008. Unit 2 and Unit 3 were tested during their scheduled outages on October 26, 2008, and April 26, 2009, respectively. No indications of possible letdown line blockage were noted during these flow tests. The inspectors found the licensee's evaluation of historical events was thorough and included a number of relevant events associated with the SSF RCM system going back till 1982.

.2 White Finding

On October 11, 2009, the Unit 1 SSF RCM system letdown line flowrate did not meet the acceptance criteria. Subsequent investigation by the licensee identified the letdown strainer was obstructed with FM. The FM was a mixture of gasket material and what was considered legacy material from previous maintenance. In November 2009, the licensee concluded that only Unit 1 was affected due to an isolated manufacturing defect based on an extent-of-condition review for Unit 2 and Unit 3. Subsequently, the licensee found similar FM on Unit 2 on February 18, 2010, and Unit 3 on February 23, 2010. The inspectors found the licensee's evaluation of historical events was thorough and included a number of relevant events associated with the SSF RCM system going back to 1982.

c. IP 95002 required that the inspection staff determine that the licensee's evaluation documents the plant specific risk consequences, as applicable, and compliance concerns associated with the issues both individually and collectively

.1 Yellow Finding

The inspectors reviewed the licensee's risk evaluation as documented in the Plant Specific Risk Consequences section of RCE PIP O-09-7536. The licensee determined a Core Damage Frequency (CDF) probability of between 1E-06/yr and 1E-05/yr for all three units. The licensee determined the dominant sequence of events to be initiating events involving 4kV Bus Duct fires in the turbine building resulting in a station blackout. The inspectors determined the licensee's evaluation to be adequate.

.2 White Finding

The licensee's evaluation referenced RCE PIP O-09-7536 report section Plant Specific Risk Consequences as the bounding analysis for this finding.

d. Findings

No findings were identified.

02.02 Root Cause, Extent-of-Condition, and Extent-of-Cause Evaluation

a. IP 95002 required that the inspection staff determine that the licensee evaluated the issue using a systematic methodology to identify the root and contributing causes

.1 Yellow Finding

The inspectors found that the systematic methods employed by the licensee were a chronology (i.e., sequenced timeline) of historical SSF letdown events of Units 1, 2, and 3, failure investigation analysis to determine equipment failure modes, event and causal factor chart, a "why" diagram, and a safety culture component evaluation. As supporting investigative analysis, the licensee included the supplemental Duke Engineering Metallurgy Laboratory testing and analysis of the FM debris found in each of the units. The inspectors determined that the licensee evaluated the issue using a systematic methodology to identify the root and contributing causes.

.2 White Finding

The licensee investigated the sequence of events associated with the original discovery of the FM in the Unit 1 SSF RCM letdown line strainer. The technical aspects of the causes were addressed in RCE PIP O-09-7536. The inspectors' review of RCE PIP O-10-1213, Revision 0, identified that the systematic methods used by the licensee were event and causal factor chart, management oversight and risk tree (MORT), organizational and programmatic interface chart, and barrier analysis. Safety culture component evaluation was completed through an associated MORT supplement. The

inspectors determined that the licensee evaluated both findings using systematic methodologies to identify root and contributing causes.

b. IP 95002 required that the inspection staff determine that the licensee's RCE was conducted to a level of detail commensurate with the significance of the issue

.1 Yellow Finding

The licensee's evaluation, issued November 21, 2009, became more extensive through two additional revisions. Revision 1 was issued April 13, 2010, and investigated the FM that was found on the SSF letdown orifice strainers of Unit 2 and 3. Revision 2 was issued November 5, 2010, with notable changes such as safety culture analysis of the event, probabilistic risk analysis (PRA) plant risk significance evaluation, and the identification of a contributing cause for decision-making based upon the safety culture evaluation. The inspectors questioned the thoroughness of Revision 2 in two areas. The first was a conclusion on the effectiveness of the Oconee FME program since 2004 that was not fully supported by a qualitative basis. The second was the conclusion from the valve vendor for the 10CFR21 Evaluation Letter, dated January 27, 2010, which was not fully investigated in the root cause report. Through additional interviews and the information provided, the inspectors concluded that the FME program and the valve vendor conclusion were adequately considered by the RCE. The inspectors determined that RCE PIP-09-7536 was ultimately conducted to a sufficient level of detail commensurate with the significance of the event.

.2 White Finding

The licensee employed a multidisciplinary team, including industry root cause evaluation experts outside the licensee's organization. The root and contributing causes identified by this RCE aligned with and significantly contributed to the four key lessons learned and identified in the Oconee Nuclear Safety Excellence Plan issued December 13, 2010.

A multi-disciplinary team was assembled with personnel based on their cause analysis expertise and their independence from the incorrect prompt determination of operability. Additionally, industry experts in cause analysis, safety culture, and corrective action program participated on the root cause team. The root cause techniques consisted of MORT, Safety Culture Evaluation, Barrier Analysis, Event and Causal Factors Chart, Organizational and Programmatic Interface Chart, and Sequence of Events Analysis. The inspectors found that the evaluation process for the RCE identified root and contributing causes of each event and also outlined lower level conclusion statements until the cause impacts were identified at the lowest level of licensee control. The inspectors determined that RCE PIP O-10-1213 was thorough and commensurate with the significance of the problem.

c. IP 95002 required that the inspection staff determine that the licensee's RCE included a consideration of prior occurrences of the issue and knowledge of Operating Experience (OE)

.1 Yellow Finding

The RCE included a review of both internal and external OE. A search of the Oconee PIP database for previous reports of the same or similar root causes and contributing causes was performed to determine if the letdown line failure was a recurring event. The review determined that the event was not similar/recurring to the extent that the corrective actions from previous cause determinations were ineffective in preventing the letdown line failure. The root cause, which originally did not include an external review, was revised to include an external OE search to determine if there were missed opportunities to prevent recurrence of a similar condition on other systems. The licensee concluded that the external OE represented several missed opportunities regarding gasket failures and strainer/filter failures due to FM and included industry recommendations regarding strainer/filter maintenance. Based on the licensee's detailed evaluation and conclusions, the inspectors determined that the licensee's revised RCE considered prior occurrences and OE.

.2 White Finding

The RCE included a review of both internal and external OE. The licensee performed a search of the PIP database from 2005-2010 for previous events with either the same or similar root causes or contributing causes. The internal OE review did not reveal additional events. A review of LER's and external OE was also completed and a review of the corrective actions associated with the OE events was performed. None of the corrective actions from the OE could have prevented the event at Oconee. An external OE review was also completed for gasket material failures and strainer clogging. The review noted the OE could have aided the prompt determination of operability (PDO) evaluation by identifying potential failure modes. Based on the licensee's detailed evaluation and conclusions, the inspectors determined that the licensee's RCE considered prior occurrences and OE.

d. IP 95002 required that the inspection staff determine that the licensee's RCE addresses the extent-of-condition and extent-of-cause of the issues

.1 Yellow Finding

RCE PIP O-09-7536, Revision 2, expanded the extent-of-condition and extent-of-cause evaluations. The RCE had to be further expanded after additional questioning by the inspectors and is further discussed in section 02.04 of this report. The licensee's RCE contained a review to identify other component locations that could be susceptible to clogging in Maintenance Rule high safety significant piping systems. As a result of the review, the licensee developed corrective actions that directed detailed reviews on complex components to identify any subcomponents susceptible to clogging. The licensee conducted an extent-of-cause review for each identified root and contributing cause. The contributing cause impact on SSF systems was given a greater depth of

evaluation based on OE. The inspectors concluded that the licensee's RCE addressed the attributes of extent-of-condition and extent-of-cause through the reviews conducted and the designated corrective actions.

.2 White Finding

The licensee's evaluation addressed the extent-of-condition for the incorrect PDO and inaccurate information through a statistical sampling analysis, which considered risk significance, for a five year period beginning in 2005. The review also included immediate operability determinations as part of the sample. The inspectors determined that the licensee's evaluation provided a detailed review of the extent-of-condition that was performed in order to determine if additional issues existed with plant documentation being incomplete or inaccurate. The licensee's extent-of-condition review did not identify any additional areas that needed to be addressed as part of the RCE; however, the inspectors did identify deficiencies in the area of maintenance rule and operability determinations. These deficiencies are discussed in section 02.04 of this report.

To address the extent-of-cause, the licensee's approach was to consider an extent-of-cause review for each root and contributing cause identified in the RCE. The extent-of-cause review for operability determinations included the following:

- Root and apparent cause reports that have evaluated equipment failure modes
- Design change reviews/packages that have incorporated or evaluated fault tree or failure mode and effect analyses information
- PRA SSC fault trees

An extent-of-cause review was performed for each root and contributing cause to determine the extent-of-cause to other plant processes and documentation. As a result of the review, the licensee identified inadequate resources as an area that appeared in several other cause evaluations. The RCE required a common cause analysis to determine if there are any common threads related between the different cause evaluations as well as a self-assessment for operability determinations and operational decision-making.

Based on the inspectors' review, discussions with licensee management and staff personnel, and the review of the Oconee Nuclear Safety Excellence Plan, the inspectors concluded that the RCE addressed both the extent-of-condition and the extent-of-cause.

e. Findings

No findings were identified.

02.03 Corrective Actions

a. IP 95002 required that the inspection staff determine that (1) the licensee specified appropriate corrective actions for each root and/or contributing cause, or (2) an evaluation that states no actions are necessary was adequate.

.1 Yellow Finding

The inspectors found that a systematic methodology, and evaluation level of detail, identified appropriate corrective actions for the root and contributing causes as previously discussed in paragraph 02.02.a.1. In addition, the reviews for extent-of-condition and extent-of-cause resulted in additional corrective actions being developed, or additional analysis to determine if appropriate corrective actions existed. The Oconee Nuclear Safety Culture Matrix aided in the review of the corrective actions by evaluating the root and contributing causes against safety culture components. The matrix displayed a conclusion for the safety culture components as either a contributor or significant contributor for the root or contributing cause. The inspectors concluded that the proposed and implemented corrective actions were appropriate and addressed each root and contributing cause.

.2 White Finding

The licensee took immediate corrective actions on Unit 2 and Unit 3 by removing the strainer assembly and inspecting the upstream piping for foreign material. All root and contributing causes in the RCE were linked to an appropriate corrective action. The inspectors determined the proposed and implemented corrective actions were appropriate and addressed each root and contributing cause.

b. IP 95002 required that the inspection staff determine that the licensee prioritized corrective actions with consideration of risk significance and regulatory compliance.

In general, the licensee's planned corrective actions for findings were in accordance with NSD 208, Program Investigation Program. The corrective actions were not prioritized based on risk significance, but on the type of corrective action involved. All actions to address the root and contributing causes fell into one of the following three categories:

Priority 1 – Corrective Actions to Prevent Recurrence (CAPR) were actions derived from RCEs to prevent recurrence of an identified issue. CAPRs were reviewed by the Corrective Action Review Board (CARB) and assigned to the appropriate group(s).

Priority 2 – Routine corrective actions are Corrective Actions that fix the unwanted condition and/or correct the contributing or cause of an issue. This action restores a condition to an acceptable level or capability.

Priority 3 – Proposed enhancement Action Items (AI) to improve performance or address issues that do not represent Conditions Adverse to Quality (CAQ) or Significant Conditions Adverse to Quality (SCAQ) and are not part of the Corrective Action Program

(CAP). CAPR Implementation Monitoring, Effectiveness Plans and their associated corrective actions are also categorized as Priority 3.

The inspectors concluded that, although the licensee did not prioritize corrective actions specifically with regard to risk significance, the prioritization methodology was determined to be adequate to assure timely completion of the actions which directly addressed correcting and preventing recurrence of the problem.

.1 Yellow Finding

The licensee's immediate corrective actions to prevent recurrence included implementing an engineering change that removed the backseat gaskets and strainers from the HP-426 valves on each unit and revised the associated maintenance procedures to support gasket and strainer removal. Based upon these corrective actions, as well as the other corrective actions identified in the RCE and sampled for inspection, the inspectors determined that the licensee prioritized corrective actions with consideration of risk significance and regulatory compliance. Interim actions were established when necessary prior to completion of proposed corrective actions.

.2 White Finding

The licensee established 20 CAPRs to address the inaccurate PDO. These actions included procedure revisions, "all hands" communications to plant staff, developing a nuclear safety culture program, conducting independent safety culture assessments, training, revisions to the corrective action programs, and industry benchmarking. The majority of these actions had been recently proposed and scheduled but had not been completed.

The RCE also included a review of licensee site directives that were applicable to the events to verify that the directives satisfied the associated regulatory requirements. In the area of the CAP, the licensee's root cause team noted significant problems and a CAP evaluation was performed as part of the RCE.

All of these corrective actions were categorized as Priority 1 and based on these actions, as well as the other corrective actions identified in the RCE and sampled for inspection, the inspectors determined that the licensee prioritized corrective actions with consideration of risk significance and regulatory compliance. Interim actions were established when necessary prior to completion of proposed corrective actions.

c. IP 95002 required that the inspection staff determine that the licensee established a schedule for implementing and completing the corrective actions.

.1 Yellow Finding

The inspectors determined that all of the corrective actions listed in the RCE have been either scheduled or completed. The evaluation indicated five interim corrective actions were complete and 58 planned corrective actions were either completed or were scheduled to be performed.

.2 White Finding

The licensee's evaluation and corrective actions included appropriate prioritization with consideration of risk significance and regulatory compliance. The completion due dates assigned to the corrective actions that reflected the prioritization considerations. CAPRs had been identified with the highest corrective action priority and interim actions have been established if longer-term actions are needed to prevent recurrence. The inspectors determined that the ownership of the corrective actions was appropriately assigned to the program and process owners. In addition, inspectors noted that work had begun on the majority of the CAPRs although most were not complete due to the depth of the CAPRs identified in RCE PIP O-10-1213. Improvement plans were initiated for the CAP and Safety Culture to ensure that the risk significant corrective actions were performed in a timely manner. Additionally, the licensee identified a high level schedule in their Nuclear Safety Excellence Plan Rev. 0. This plan established target milestones for major groupings of corrective actions.

d. IP 95002 required that the inspection staff determine that the licensee developed quantitative and/or qualitative measures of success for determining the effectiveness of the corrective actions to preclude repetition.

.1 Yellow Finding

The inspectors determined that the licensee had established measures for determining the effectiveness of corrective actions to prevent recurrence (CAPRs) for the root and contributing causes. For example, corrective action sequence # 127 created an Effectiveness Review Plan (ERP) that will focus on acceptable equipment performance, procedural adequacy and scheduling appropriateness for corrective action sequences #6, 11, 12, 13, 14, 15, 16, 20, 22, 27, 28 and 65. This ERP was to be accomplished by: 1) obtaining and comparing test data from the next three sequential performances of PT/1,2,3/A/0400/020 to ensure that flow is within acceptable tolerance given in the procedure; 2) performing interim reviews after each refueling outage; 3) verifying that the technical bases for PT/1,2,3/A/0400/020 model work order identifies the basis for the frequency (i.e. CAPR); and 4) verify that the appropriate schedule ties are in place to ensure this test is performed during Unit startup. This ERP was scheduled for completion during future refueling outages.

.2 White Finding

The inspectors determined that the licensee had established measures for determining the effectiveness of CAPRs for the root and contributing causes. The effectiveness reviews included guidance on the measures to be used to determine if the CAPRs were effectively implemented. For example, corrective action sequence # 13 proposed a change to NSD 203 to require a management review team review and validate the PDO conclusions. The management review team was primarily tasked to identify and challenge critical assumptions, failure modes, and conclusions. Corrective action sequence # 28 created an ERP that will perform independent assessments of the implementation of the management review team for PDOs. Additional assessments and

reviews were outlined in the corrective actions to ensure that the Safety Culture Improvement Plan and CAP Improvement Plan were appropriately addressing the corrective actions.

The licensee also developed a Nuclear Safety Excellence Plan Rev. 0, which provided monitoring to ensure that the substantive corrective actions implemented as part of the plan are effective and sustainable. It was to be based on objective evidence wherever possible and will be evaluated through pre-defined effectiveness review assessments. It stated, in part that effectiveness reviews will be performed on all corrective actions that are intended to prevent recurrence. The effectiveness may be performed on groups of corrective actions if they were not designated as CAPRs. Examples of effectiveness reviews included self-assessments, independent assessments, peer reviews, process monitoring, and performance indicators. The plans for, and the results of, effectiveness reviews were documented in a PIP.

e. IP 95002 required that the inspection staff determine that the licensee's planned or taken corrective actions adequately address a Notice of Violation (NOV) that was the basis for the supplemental inspection, if applicable.

.1 Yellow Finding

The licensee's evaluation resulted in the development of two root causes and five contributing causes. RCE PIP O-09-7536, Revision 2, upgraded a contributing cause of the valve deficiency to a root cause and also added a contributing cause of Decision Making based on the safety culture evaluation. The root and contributing causes resulted in the development of 58 corrective actions. The RCE was predominately focused on the technical aspects of the SSF letdown line orifice strainer FM blockage. These corrective actions aligned with the technical aspects such as removal of the strainers, engineering change documents to remove the backseat gasket from the valves, revision of testing methodology of SSF letdown flow, and revised procedural guidance on strainer design considerations.

The licensee issued LER 05000269/2010-01, Revision 1, which documented the conclusion that, after additional testing and evaluation, the condition also affected Unit 2 and Unit 3. In addition, the SDP concluded that the condition should be characterized as having substantial safety significance. The LER revision also documented the conclusion that the vendor valve design defect was a reportable defect in accordance with 10CFR21, with the LER providing the required regulatory information. Through discussions with the licensee staff and the review of RCE PIP O-09-7536, Revision 2, and LER 05000269/2010-01, Revision 1, the inspectors concluded that the corrective action developed in response to the NOV adequately addressed the root causes.

f. Findings

No findings were identified. During their review of the licensee's CAP, inspectors noted several examples where corrective actions, not related to these RCEs, were being closed outside of the CAP process in mechanisms like DocuTracks and Work Requests. The inspectors discussed this observation with the licensee and determined that this

practice could result in safety related or risk significant equipment deficiencies not being captured and tracked in the CAP. The licensee entered this observation into their CAP as PIP O-10-10042.

After the inspectors questioned the licensee regarding the extent-of-condition/cause review from RCE PIP O-09-7536, the licensee found that the planning and scheduling of work requests to inspect internals of the Unit 2 and Unit 3 Main Steam system strainers were not complete although the work requests were written approximately 11 months prior to this inspection. The licensee entered this observation into their CAP as PIP O-10-10958.

02.04 Independent Assessment of Extent-of-Condition and Extent-of-Cause

a. Inspection Scope

IP 95002 required that the inspectors independently assess the validity of the licensee's conclusions regarding the extent-of-condition and extent-of-cause of the findings. The objective of this requirement was to independently sample performance, as necessary, within the key attributes of the cornerstone that were related to the findings to ensure that the licensee's evaluation regarding the extent-of-condition and extent-of-cause were sufficiently comprehensive.

The inspectors' review focused on the primary root causes associated with the findings and also on contributing causes that involved more specific aspects of the root causes. The inspectors reviewed the licensee's operability evaluation process to verify that the licensee was making proper operability determinations. The verification included attributes such as the analysis of the degraded condition and if compensatory measures were required. In addition, the inspectors verified the licensee's consideration of other degraded conditions and their impact on compensatory measures for the condition being evaluated. If the operability evaluation involved compensatory measures, the inspectors verified that the compensatory measure was in place, would function as intended, and were appropriately controlled.

The inspectors performed walk down inspections of the SSF and associated equipment to assess configuration control, review outstanding deficiency tags or work requests, assess housekeeping, and assess overall readiness of the SSF. The inspectors reviewed a sample of open work requests, PIPs, and planned corrective actions associated with the SSF.

The inspectors reviewed the licensee's implementation of maintenance rule by sampling corrective action documentation, event reports, plant operating history, equipment operating history, and maintenance records to identify equipment maintenance problems that may have occurred in the following categories:

- Equipment that has a history of recurring problems
- Equipment whose failure resulted in a safety system actuation or plant shutdown
- Equipment whose failure resulted in reduced system capability

b. Assessment

In general, the inspectors determined that the extent-of-condition and extent-of-cause for the contributing causes were adequate. However, after questioning by the inspectors regarding the degree to which the licensee's review considered testing and maintenance history of other safety significant systems, the licensee determined that the extent-of-condition review had only scoped strainer/orifice combinations rather than all strainers. This deficiency in the extent-of-condition review was entered into the licensee's corrective action program as PIP O-10-10180 and RCE PIP O-09-7536 was updated to reflect the expanded extent-of-condition review. This expansion of the extent-of-condition review did not identify any additional similar components of concern.

The inspectors performed a detailed walk down of the SSF and noted a number of deficiencies not previously identified by the licensee in their CAP. This is further discussed in Section 02.04.c.1. The licensee initiated PIPs for these observations. The inspectors also reviewed equipment maintenance history over the last 2 years for the following SSF components.

- SSF Diesel Generator
- SSF Fuel Oil System
- SSF Reactor Coolant Makeup Pump
- SSF ASW Pump
- SSF Motor Operated Vaves
- SSF HVAC Compressors
- SSF Air system (safety related)
- SSF Battery System

The review also included a maintenance rule evaluations for SSF equipment and a review of the SSF a(1) maintenance rule action plan. A review of vibration trends for specific components was also reviewed. In addition, a review of the Keowee system and system components maintenance history was also performed.

The inspectors reviewed a sample of various operability evaluations in the licensee's CAP. From a listing of PIPs from 2009 thru 2010, 21 potential samples were selected for further review based on safety significance or applicability to the SSF system. From the 21 potential samples, the inspectors selected eight operability evaluations to be reviewed in detail. The inspectors' review of seven operability evaluations through interview of licensee staff and information provided, resulted in the identification of acceptable justification. However, the inspectors questioned the acceptable compliance to the minimum wall thickness of 0.133 inch as stated in the operability evaluation for PIP O-10-06578, Piping upstream of valve CCW-284 is pitted and has some wall thinning. The piping's safety function was to provide a pressure boundary for the diesel service water system used cool the SSF Diesel. This question was based on subtracting the observed 1/16 inch deep pitting from the piping wall thickness of approximately 3/16 inch which resulted in a remaining wall thickness of approximately 0.1250 inch. The inspectors requested the ultrasonic testing that had been documented as performed to determine the actual as-found piping wall thickness. The licensee later determined that

ultrasonic testing had not been performed. The licensee then performed ultrasonic testing along with other activities to determine the operability of the piping. The results of the ultrasonic testing demonstrated that the actual wall thickness was greater than minimum wall thickness. The inspectors walked the piping location with the technician that had performed the ultrasonic testing, discussed his testing methodology and reviewed the ultrasonic test records. The training qualification record of the technician was determined to be acceptable.

c. Findings

.1 Failure to Review and Evaluate Potentially Degraded Conditions

Introduction: An NRC-identified Green NCV of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," was identified for the licensee's failure to failure to evaluate degraded or nonconforming conditions and perform operability determinations or functionality assessments as prescribed in procedure OMP 2-01. The inspectors identified examples where the licensee routinely failed to evaluate known conditions adverse to quality documented in work orders (WO) and work requests (WR) for potential impact on the operability or functionality of SSC.

Description: The inspectors reviewed PIPs, WOs and WRs associated with the SSF to determine if degraded or nonconforming conditions were being properly evaluated and corrected. The inspectors identified four examples where work requests had been written for degraded conditions that had not been reviewed for potential operability or functionality concerns as required by procedure OMP 2-01; "Duties and Responsibilities of On-Shift Operations Personnel," Section 4.10. The inspectors interviewed several work control center (WCC) SRO's and system engineers and determined that the reviews of WOs or WRs required by these procedures for determining operability or functionality were not routinely performed.

Analysis: The failure to evaluate WOs or WRs for potentially degraded or nonconforming conditions as required by OMP 2-01 was a performance deficiency (PD). This PD was more than minor because, if it is left uncorrected it had the potential to lead to a more significant safety concern. The failure to evaluate potential conditions adverse to quality could result in the licensee failing to determine that a degraded or nonconforming condition adversely affected the system's ability to perform its safety function. Using IMC 0609, "Significance Determination Process," Phase 1 Worksheets, the finding was determined to have very low safety significance (Green) because the finding did not represent an actual loss of safety function of the system or train. This finding has a cross cutting aspect of licensee defines and effectively communicates expectations regarding procedural compliance in the Work Practices component in area of Human Performance because licensee management failed to define and effectively communicate expectations regarding procedural compliance such that personnel follow procedures [H.4(b)].

Enforcement: 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," required, in part, that activities affecting quality shall be prescribed by instructions or procedures of a type appropriate to the circumstances and be

accomplished in accordance with these instructions or procedures. Licensee procedure OMP 2-01, "Duties and Responsibilities of On-Shift Operations Personnel," Section 4.10, provided direction for the Work Control Center Senior Reactor Operator to review WOs and WRs to determine if operability or functionality of plant systems or components was affected. Contrary to the above, as of December 17, 2010, the licensee was not reviewing WOs and WRs to determine if operability of functionality of plant systems or components was affected. Because this violation was of very low safety significance and has been entered into the licensee's corrective action program as PIP O-10-10975, this violation is being treated as a non-cited violation consistent with the NRC Enforcement Policy: NCV 05000269, 270, 287/2010009-01, "Failure to Properly Evaluate Potentially Degraded Conditions for Potential Impact on Operability or Functionality."

.2 Failure to Adequately Monitor Performance of the Standby Shutdown Facility HVAC System as Required by 10 CFR 50.65

Introduction: An NRC-identified Green non-cited violation (NCV) of 10 CFR 50.65(a)(2), was identified for failure to demonstrate that SSF ventilation system performance was being effectively controlled through the PM program, or place the system in 10 CFR 50.65(a)(1) status due to SSF HVAC system maintenance rule functional failures beyond established performance criteria.

Description: The inspectors reviewed maintenance history on the SSF and associated equipment for the last 5 years. The SSF HVAC system used two compressor/condenser units supplying one air handling/evaporator unit. The inspectors noted that the #2 compressor had multiple failures in 2007 requiring corrective maintenance. The following failures were noted:

- May 24, 2007, #2 SSF HVAC compressor failed due to inadequate freon charge
- June 2, 2007, #2 SSF HVAC compressor had low discharge pressure 165 psig (normal 170-270 psig) and low suction pressure 43-48 psig (normal 60-75 psig) #1 compressor was cycling on and off every 5 minutes to support the load
- September 4, 2007, #2 SSF HVAC compressor was the lead compressor and it was not running (Initial cause noted as sticking relays and later determined to be failed Thermal Expansion Valve (TXV))
- September 13, 2007, #2 SSF HVAC compressor was the found off with the lag compressor running (Failed Thermostatic Expansion Valve (TXV)

The licensee had initially misdiagnosed the cause of the September 4, 2007, failure as a sticking relay and later found the cause to be a TXV failure. Although the licensee had identified these as functional failures (FFs), the inspectors determined that the licensee did not assess these failures as maintenance preventable functional failures (MPFFs) based on an inadequate TXV replacement frequency or repeat MPFFs (RMPFFs) based on the failure on September 13th being a repeat of the September 4th failure. The licensee's maintenance rule program criteria for the SSF system is zero RMPFFs and did not perform an evaluation to determine if the system should be placed in 10 CFR 50.65 a(1) status.

The licensee determined that their MR procedures allowed different interpretations of what was a functional failure. The inspectors discussed the compressor/condenser unit failures with the licensee and found that the licensee believed that whenever the outside ambient temperatures did not require both ventilation compressors for operability functionality of the system had been maintained. The licensee performed a complete review of failures on the ventilation system and other high safety significant systems to determine if other systems had missed additional MPFFs based on outside ambient temperatures.

Analysis: The failure to perform adequate performance or condition monitoring on the SSF HVAC system was a PD. This PD was more than minor because it was associated with the equipment performance attribute of the Mitigating Systems Cornerstone and adversely affected the cornerstone objective in that the licensee failed to demonstrate effective control of the SSF HVAC system through appropriate preventive maintenance. Using IMC 0609 Phase 1 worksheets, the inspectors determined that this finding had very low safety significance (Green) because it did not result in the actual loss of safety function of one or more non-Tech Spec Trains of equipment, designated as risk-significant per 10 CFR 50.65, for greater than 24 hours. This finding had a cross cutting aspect of complete, accurate, and up-to-date procedures in the Resources component in the area of Human Performance for the licensee not ensuring their maintenance rule procedures were adequate to provide clear and accurate guidance on how to classify functional failures. [H.2(c)].

Enforcement: 10 CFR 50.65(a)(1) required, in part, that the licensee monitor the performance or condition of structures, systems, or components within the scope of the monitoring program as defined in 10 CFR 50.65 (b) against licensee-established goals. Title 10 CFR 50.65(a)(2) states, in part, that monitoring as specified in 10 CFR 50.65(a)(1) was not required where it has been demonstrated that the performance or condition of a SSC was being effectively controlled through performance of appropriate preventive maintenance such that the SSC remains capable of performing its intended function. Contrary to the above, from September 13, 2007, through December 17, 2010, the licensee failed to demonstrate that performance of the SSF HVAC compressors were being effectively controlled through the performance of appropriate preventive maintenance, in that, after a RMPFF of the SSF #2 HVAC compressor occurred on September 13, 2007, the licensee failed to consider placing the system in 10 CFR 50.65 (a)(1) status for establishing goals and monitoring against the goals. Because this violation was of very low safety significance and was entered into the licensee's corrective action program PIP O-10-10976, this violation is being treated as a NCV consistent with the NRC Enforcement Policy: NCV 05000269, 270, 287/2010009-02, Failure to Adequately Monitor Performance of the Standby Shutdown Facility HVAC System as Required by 10 CFR 50.65.

02.05 Safety Culture Consideration

a. Inspection Scope

IP 95002 required that the inspectors independently determine that the licensee's RCE appropriately considered whether any safety culture component caused or significantly

contributed to any risk significant issue. The inspectors reviewed condition reports and procedures and conducted interviews with licensee personnel to determine if the licensee properly considered whether any safety culture component caused or contributed to the findings.

b. Assessment

The licensee performed a safety culture evaluation and compared the components of safety culture to the root and contributing causes that were identified in RCE PIP O-09-7536, Revision 2, and RCE PIP O-10-1213, Revision 0. The licensee's safety culture evaluation considered whether any safety culture component contributed to or significantly contributed to any of the performance issues identified. The inspectors assessed the licensee staff for the inclusion of safety culture components through individual and group discussions. The inspectors did not identify any significant concerns with the licensee's RCE safety culture evaluations.

The RCE included a discussion of the thirteen safety culture components as defined in IMC 0305, Operating Reactor Assessment Program, and IMC 0310, Components with Cross-Cutting Areas, as they applied to these findings. The focus of this effort was to determine if safety culture components caused or significantly contributed to the individual and collective risk-significant performance issues and to identify areas of weakness where additional corrective actions were warranted.

The inspectors reviewed the results of the licensee's 2009 safety culture survey and PIP O-09-6820 which summarized the survey results. In general, the inspectors found that the summary reflected the overall results of the survey. However, there seemed to be an inconsistency where the PIP summary suggested that there were positive survey comments related to the reliability of equipment in the SSF, but actual survey comments specifically called into question the reliability of SSF equipment back in the June 2009 timeframe. This could have been a missed opportunity for heightened awareness into the latent equipment issues in the SSF. The inspectors also noted that the results of previous safety culture evaluations or earlier safety culture surveys were not considered in RCE PIP O-09-7536. This observation was captured in the licensee's correction action program as PIP O-10-10689.

Additionally, the inspectors randomly interviewed a cross-disciplinary section of more than 50 people to better understand the SCWE at Oconee. The inspectors attended a number of meetings including the morning Shift Manager Meeting, Morning Alignment Meeting, Operations Pre-Shift Brief Meeting, and PIP and Work Request screening meetings. The inspectors found that the meetings were well attended and members were adequately prepared. In general, there was good discussion and interaction among the group members with a proper focus on safety. Generally, the inspectors found that licensee staff felt free to raise safety concerns and most all staff were aware of the Employee Concerns Program and did not identify any specific concerns regarding its use.

Yellow Finding

The licensee evaluated each safety culture component to determine if it could reasonably have been the root cause or a significant contributor to the condition. The licensee concluded that none of the safety culture components were identified as root causes; however, deficiencies related to the contributing causes were assigned Safety Culture Aspects. It should be noted that some of the referenced associated contributing causes were identified in RCE PIP O-10-1213. An additional contributing cause in the area of Decision Making was identified for RCE PIP O-09-7536 as a result of the licensee's safety culture evaluation.

White Finding

The licensee evaluated the inadequate prompt determination of operability (PDO) for Unit 2 and Unit 3 SSF and inadequate application of the CAP to identify and correct the related problems in a timely manner. As a result of the evaluation, several root causes and significant contributing causes were identified in the areas of Decision Making, Resources, Work Practices, Corrective Action Program, Environment for Raising Concerns, Accountability, Continuous Learning Environment, and Safety Policies. The licensee developed a Safety Culture Improvement Plan to address identified issues.

The licensee evaluated each safety culture component to determine if it could reasonably have been the root cause or a significant contributor to the condition. Three of the safety culture cross-cutting components were identified as new root causes. These were inadequate Decision Making, Resources, and Corrective Action Program. The safety culture evaluation also validated that the other identified four root and four contributing causes were either a significant contributor or a weakness. These areas included Work Control, Work Practices, and Accountability. Procedure Use and Adherence and Inadequate Management Oversight were also identified as safety culture issues.

c. Findings

No findings were identified.

02.06 Evaluation of IMC 0305 Criteria for Treatment of Old Design Issues

The licensee did not request credit for self-identification of an old design issue; therefore, the risk-significant issue was not evaluated against the IMC 0305 criteria for treatment of an old design issue.

4OA6 Meetings, Including Exit

On December 17, 2010, the inspectors presented the inspection results to you and other members of your staff. The inspectors confirmed that no proprietary information was reviewed by the inspectors.

ATTACHMENT: SUPPLEMENTAL INFORMATION

Enclosure

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee personnel:
K. Alter, Regulatory Compliance Manager
S. Batson, Plant Manager
J. Bohlmann, Manager Organizational Effectiveness
M. Clarkson, Senior Engineer
G. Davenport, Work Control Supervisor
C. Dunton, Chemistry Manager
F. Eppler, MCE Supervisor
C. Fago, Engineering Supervisor
P. Fisk, MCE Manager
P. Gillespie, Site VP
J. Hrynda, Shift Manager
R. Jones, QA Team Leader
Z. Jones, Primary Plant Engineer
D. McNeely, Training Supervisor
K. Nicholson, Project Engineer
T. Patterson, Safety Assurance Manager
B. Pipkin, BOP Engineer
M. Ramey, Maintenance Outage Coordinator
T. Ray, Engineering Manager
B. Richards, BOP Engineer
S. Severance, Senior Regulatory Compliance Engineer
M. Stevens, Operations

NRC Personnel:
A. Sabisch, Senior Resident Inspector
K. Ellis, Resident Inspector

LIST OF REPORT ITEMS

Open and Closed

05000269, 270, 287/2010009-01	NCV	Failure to Properly Evaluate Potentially Degraded Conditions for Potential Impact on Operablility or Functionality (Section 2O4.c.1)
05000269, 270, 287/2010009-02	NCV	Failure to Adequately Monitor Performance of the Standby Shutdown Facility HVAC System as Required by 10 CFR 50.65 (Section 2OA4.c.2)

Closed

05000269, 270, 287/2010007-01	VIO	Failure to Promptly Identify and Correct an Adverse Condition Affecting Operability of Unit 2 and Unit 3 Standby Shutdown Facility (Section 4OA5.1)
05000269, 270, 287/2010007-03	VIO	SSF Reactor Coolant Makeup System Inoperable for Greater than Allowed by Technical Specifications (Section 4OA5.3)
05000269/2010-01-00,-01	LER	Standby Shutdown Facility Letdown Line Orifice Strainer Blocked by Valve gasket Material (Section 4OA3)

LIST OF DOCUMENTS REVIEWED

Problem Investigation Process (PIP) Documents:

O-04-02808	O-07-00669	O-08-00620	O-09-05632	O-10-03882
O-05-01114	O-07-00765	O-08-00707	O-09-06125	O-10-04009
O-05-03724	O-07-00788	O-08-00707	O-09-06777	O-10-04491
O-06-01475	O-07-00876	O-08-00714	O-09-06777	O-10-04887
O-06-01633	O-07-00946	O-08-01267	O-09-06820	O-10-04942
O-06-02304	O-07-01049	O-08-01267	O-09-07536	O-10-05329
O-06-02359	O-07-01127	O-08-01298	O-09-07536	O-10-05352
O-06-02978	O-07-01158	O-08-01330	O-09-08333	O-10-05376
O-06-03002	O-07-01176	O-08-01483	O-09-08432	O-10-05419
O-06-03500	O-07-01297	O-08-01527	O-09-08432	O-10-05561
O-06-03588	O-07-01342	O-08-01529	O-09-09058	O-10-05607
O-06-04006	O-07-02102	O-08-01628	O-09-09058	O-10-05739
O-06-04101	O-07-02159	O-08-01628	G-10-00135	O-10-05887
O-06-04198	O-07-02258	O-08-01746	G-10-00510	O-10-06316
O-06-04258	O-07-02462	O-08-01746	G-10-00539	O-10-06472
O-06-04287	O-07-02605	O-08-01926	G-10-00753	O-10-06578
O-06-04486	O-07-02637	O-08-01940	G-10-00799	O-10-06597
O-06-04546	O-07-03011	O-08-02264	G-10-00800	O-10-06604
O-06-04576	O-07-03011	O-08-02264	G-10-00952	O-10-06708
O-06-04649	O-07-03016	O-08-02496	G-10-01277	O-10-06726
O-06-05077	O-07-03915	O-08-02496	G-10-01278	O-10-06726
O-06-05078	O-07-03915	O08-02565	G-10-01549	O-10-06736
O-06-05456	O-07-04198	O-08-02565	O-10-00351	O-10-06739
O-06-05503	O-07-04198	O-08-02647	O-10-00494	O-10-06846
O-06-05742	O-07-04251	O-08-02647	O-10-00825	O-10-06950
O-06-05910	O-07-04251	O-08-03881	O-10-00952	O-10-07030
O-06-06105	O-07-04773	O-08-03881	O-10-00952	O-10-07085
O-06-06201	O-07-04858	O-08-04785	O-10-01203	O-10-07111
O-06-06236	O-07-04858	O-08-04785	O-10-01213	O-10-07232
O-06-06400	O-07-05069	O-08-07986	O-10-01652	O-10-07315

O-06-06713	O-07-05283	O-09-00698	O-10-01652	O-10-07430
O-06-06879	O-07-05669	O-09-01056	O-10-01814	O-10-07540
O-0606919	O-07-05898	O-09-01070	O-10-01814	O-10-07580
O-06-07416	O-07-05898	O-09-01504	O-10-01890	O-10-07608
O-06-07596	O-07-06941	O-09-01504	O-10-02122	O-10-08228
O-06-07827	O-07-06941	O-09-01536	O-10-02122	O-10-08412
O-06-08046	O-07-07595	O-09-01638	O-10-02123	O-10-10042
O-06-08238	O-07-07637	O-09-01638	O-10-02123	O-10-10099
O-06-08280	O-07-07637	O-09-01741	O-10-02172	O-10-10180
O-06-08694	O-07-07656	O-09-02161	O-10-02448	O-10-10210
O-06-08844	O-08-00139	O-09-02716	O-10-02951	O-10-10477
O-06-08846	O-08-00393	O-09-03484	O-10-03167	O-10-10555
O-06-08879	O-08-00447	O-09-03493	O-10-03167	O-10-10658
O-06-08929	O-08-00472	O-09-03990	O-10-03285	O-10-10686
O-06-08943	O-08-00486	O-09-03990	O-10-03285	O-10-10764
O-07-00161	O-08-00517	O-09-04326	O-10-03379	O-10-10780
O-07-00271	O-08-00519	O-09-05199	O-10-03453	
O-07-00412	O-08-00526	O-09-05205	O-10-03524	
O-07-00558	O-08-00534	O-09-05205	O-10-03825	

Work Requests:

951727	918477	974704	948404
994948	985712	995835	974700
971569	991106	983407	962205
987691	978335	974703	978335
983956	797069	967829	891994
892391	985712	984171	934184
927888	915539	904538	1008725
1015053	1015045	1010531	1008019
1006799	1015312	1015223	997505
997515	997510	946321	

Work Orders:
01655405, 01720599, 1905899, 1905900

Drawings:
O-SSF-41415-01, Revision 0, SSF Piping Analysis & Isometric
OC-EL-KHG-18 – Keowee Electrical Distribution (Training)
OP-OC-EL-EPO-2 – Electrical Distribution (Training)
4450-FO-1 – Distribution section of 214 - 8X – RH Turbine

Procedures:
AP/1-2/A/1700/036, Revision 8, Degraded Control Room Area Cooling
PT/2/A/0600/012, Revision 87, Turbine Driven Emergency Feedwater Pump Test
EDM 210, Engineering Responsibilities for the Maintenance Rule, Rev. 10
NSD 203, Revision 23, Operability/Functionality
WPG 6.7, Outage Schedule Change Request Process, Revision 8

TT/1/A/0400/025, Unit 1 SSF RC Letdown Line Discharge Test, Revision 0
PT/1/A/0400/020, SSF RC Letdown Line Discharge Test, Revision 2
NSD 208, Problem Investigation Program, Revision 32
NSD 212; Causal Analysis, Rev. 18
NSD 602, Safety Conscious Work Environment and Employee Concerns Program, Revision 6
IP/0/A/3010/006 – Cable Installation and Removal Rev. 28
OMP 2-01; Duties and Responsibilities of On-Shift Operations Personnel, Rev. 71
PT/0/B/0120/034 – Time Critical Component Surveillance Rev. 4
AM/0/A/1300/059 – Pump- Submersible- Emergency SSF Water Supply – Installation and Removal Rev. 8
IP/0/B/3000/020 – PM of Self- Contained Battery Packs on Emergency Lights
MP/0/A/1705/032 Fire Protection Equipment Inspection Rev. 32
IP/0/A/3000/001 G – SSF Battery Weekly Surveillance for C&D LCR 21 Cells Rev. 5
OP/1/A/2000/01-KHU-1 Alarm Response Guide
OP/2/A/2000/01-KHU-2 Alarm Response Guide
PT/1/A/2200/11 KHU-1 Turbine Guide Bearing Oil System Surveillance Rev.8
PT/2/A/2200/11 KHU-2 Turbine Guide Bearing Oil System Surveillance Rev.10
PT/0/A/0610/022 Degraded Grid and Switchyard Isolation Test Rev.29
PT/0/A/0620/016 Keowee Hydro Emergency Start Test Rev.42
PT/0/A/0620/009 Keowee Hydro Operation Rev.45

Miscellaneous Documents:

Ultrasonic Thickness Measurement Report, Batch #09325, Completed December15, 2010 for 45 degree elbow upstream of Valve CCW-284
Nuclear Safety Excellence Plan, Revision 0, December 13, 2010
NS0001, Nuclear Supplemental Terms to Duke Energy Terms and Conditions of Contract, Section 4.0, Rev. 05/10
ONS Nuclear Safety Culture Component to Corrective Action Matrix
Safety Culture Survey Questions, Copywrited Material
OSS-0254.00-00-1004, Design Basis Specification for the SSF RC Makeup System, Revision 34, dated 10/31/1994
OSS-0254.00-00-1050, Appendix A. Testing/Calculation Matrix for the SSW System, Revision 5
OSS-0254.00-00-1049, Appendix A. Testing/Calculation Matrix for the ESV System, Revision 7
On-Line Work Control Performance Measures
ONS Nuclear Safety Excellence Plan, Revision 0, dated 12/13/2010
DPC-1205.19-00-0005 Evaluation of Mobile 28 Grease as a MOV Stem Lubricant
OSC-8159 SSF HVAC Calculations Using RT3 Rev. 1
EDM-210 Engineering Directives Manual Rev. 10
ISPG-001 ISC Guidance Document for Retention Rules and File Plan
WPM 601 Work Process Manual – On-Line Management Rev. 24