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

August 1, 2008

Mr. David A. Baxter
Site Vice President
Duke Power Company, LLC
d/b/a Duke Energy Carolinas, LLC
Oconee Nuclear Station
7800 Rochester Highway
Seneca, SC 29672

SUBJECT: OCONEE NUCLEAR STATION - NRC SPECIAL INSPECTION REPORT 05000269/2008008

Dear Mr. Baxter:

On June 4, 2008, the U.S. Nuclear Regulatory Commission (NRC) completed the onsite portion of a special inspection at your Oconee Nuclear Station, Unit 1. The inspection reviewed the circumstances surrounding the Unit 1 plant shutdown on April 12, 2008, in preparation for the end-of-cycle 24 refueling outage. Specifically, while performing plant cooldown and depressurization activities in support of the outage, the plant experienced abnormally high vibrations on all three of the operating reactor coolant pumps (RCPs) (i.e., sequentially on the 1B2, 1B1, and 1A2 RCPs) approximate 8 gallons per minute leak from the 1A2 RCP seal package and other indications of degraded stages on the 1B2 RCP seal package were also present. At the time the 1A2 RCP seal leak occurred, the plant was on decay heat removal. However, the operating RCPs had exhibited elevated vibration levels throughout the cooldown and depressurization. In accordance with NRC Management Directive 8.3, "NRC Incident Investigation Program," a special inspection was warranted because of the potential generic aspects of the event and the estimated conditional core damage probability exceeded 1E-6. The determination that the inspection would be conducted was made by the NRC on April 25, 2008, and the inspection started on April 28, 2008. The preliminary inspection results were discussed with you and members of your staff on June 4, 2008. Subsequently, additional in-office reviews were conducted and the enclosed inspection report documents the final inspection results which were discussed via telephone with you and members of your staff on July 2, 2008.

This inspection was performed in accordance with Inspection Procedure 93812, "Special Inspection," and focused on the areas discussed in the enclosed inspection charter. The inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations, and with the conditions of your license. The team reviewed selected procedures and records, conducted field walkdowns, observed activities, and interviewed personnel.

Our reviews indicated that attention was focused on activities related to entering the refueling outage, and this contributed to less than rigorous compliance with important response procedures when unexpected conditions were experienced. Additionally, we noted that the use of guidance that permits actions to be taken outside of those set forth in prescribed procedures contributed to some of the performance issues. Our reviews of your corrective actions during

future inspections will include examination of these aspects. We recognize that the plant conditions at the time of the incident (reactor shutdown and reactor coolant system at reduced pressure) significantly limited the potential public health and safety implications.

This report documents four NRC-identified findings of very low safety significance (Green), which were determined to involve violations of NRC requirements. However, because of their very low safety significance and because they were entered into your corrective action program, the NRC is treating these findings as non-cited violations (NCVs), consistent with Section VI.A.1 of the NRC Enforcement Policy. If you contest any NCV in this report, 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, D.C. 20555-0001; with copies to the Regional Administrator, Region II; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, D.C. 20555-0001; and the NRC Resident Inspector at the Oconee station.

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 NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electric Reading Room).

Sincerely,

Leonard D. Wert

Leonard D. Wert, Director
Division of Reactor Projects

Docket No.: 50-269
License No.: DPR-38

Enclosure: NRC Special Inspection Report 05000269/2008008
w/Attachments: 1. Supplemental Information
2. Special Inspection Team Charter

cc w/encl.: (See page 2)

cc w/encl:
Berry G. Davenport
Compliance Manager (ONS)
Duke Power Company, LLC d/b/a Duke
Energy Carolinas, LLC
Electronic Mail Distribution

Lisa F. Vaughn
Associate General Counsel
Duke Energy Corporation
526 South Church Street-EC07H
Charlotte, NC 28202

Kathryn B. Nolan
Senior Counsel
Duke Energy Corporation
526 South Church Street-EC07H
Charlotte, NC 28202

David A. Repka
Winston Strawn LLP
Electronic Mail Distribution

Beverly O. Hall
Chief, Radiation Protection Section
Department of Environmental Health
N.C. Department of Environmental
Commerce & Natural Resources
Electronic Mail Distribution

Susan E. Jenkins
Director, Division of Waste Management
Bureau of Land and Waste Management
S.C. Department of Health and
Environmental Control
Electronic Mail Distribution

R. Mike Gandy
Division of Radioactive Waste Mgmt.
S.C. Department of Health and
Environmental Control
Electronic Mail Distribution

County Supervisor of Oconee County
415 S. Pine Street
Walhalla, SC 29691-2145

Lyle Graber
LIS
NUS Corporation
2650 McCormick Drive
Clearwater, FL 34619-1035

R. L. Gill, Jr.
Manager
Nuclear Regulatory Issues & Industry Affairs
Duke Power Company, LLC d/b/a Duke
Energy Carolinas, LLC
Electronic Mail Distribution

Charles Brinkman
Director
Washington Operations
Westinghouse Electric Company
Electronic Mail Distribution

Dhiaa M. Jamil
Group Executive and Chief Nuclear Officer
Duke Energy Carolinas, LLC
Electronic Mail Distribution

Senior Resident Inspector
Oconee Nuclear Station
U.S. Nuclear Regulatory Commission
7812B Rochester Hwy
Seneca, SC 29672

U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket No.:	50-269
License No.:	DPR-38
Report No.:	05000269/2008008
Licensee:	Duke Power Company, LLC
Facility:	Oconee Nuclear Station, Unit 1
Location:	Seneca, SC
Dates:	April 28 - July 2, 2008
Inspectors:	G. Gardner, Reactor Inspector C. Kontz, Operations Engineer M. Thomas, Senior Reactor Inspector, Team Lead
Approved by:	Steven D. Rose, Acting Chief Reactor Projects Branch 1 Division of Reactor Projects

Enclosure

SUMMARY OF FINDINGS

IR 05000269/2008008; 04/28/2008 - 07/02/2008; Oconee Nuclear Station, Unit 1; Special Inspection.

This report documents special inspection activities performed onsite, and in the Region II office, by a region-based senior reactor inspector, a reactor inspector, and an operations engineer, to review the Oconee Unit 1 reactor coolant pump seal failures during a reactor shutdown, cooldown, and depressurization on April 12, 2008. Four Green non-cited violations were identified. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" (SDP). The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 4, dated December 2006.

A. NRC-Identified and Self-Revealing Findings

Cornerstone: Initiating Events

- Green. The team identified a non-cited violation of Technical Specification 5.4.1 for failure to properly implement procedure OMP 1-18, Implementation Standard During Abnormal and Emergency Events, which allows actions to be taken outside of procedures during abnormal or emergency events only to place the plant in a safe/stable condition. Contrary to the requirements of OMP 1-18, the licensee took actions outside abnormal operating procedures (APs) on two occasions during Unit 1 cooldown and depressurization activities, after the plant was already in a safe/stable condition on low pressure injection (LPI) decay heat removal (DHR). The first occasion involved the continued operation of reactor coolant pump (RCP) 1A2 (for reactor coolant system degas and crud burst) at vibration levels above the trip setpoint in AP/1/A/1700/016, Abnormal Reactor Coolant Pump Operation, on April 12, 2008, after establishing LPI DHR. Approximately 2½ hours later, the 1A2 RCP seals began to fail and a seal leak developed. The second occasion involved reactor building (RB) iodine detector 1RIA-48 that was discovered in alarm on April 13, 2008, due to the 1A2 RCP seal leak that was in progress. The RB evacuation alarm was not sounded as required by procedure AP/1/A/1700/018, Abnormal Release of Radioactivity, and some personnel were allowed to continue working inside the RB. As such, these actions had the potential to increase the radiological risk to plant personnel if an unexpected change in the 1A2 RCP seal leak had occurred while personnel were inside the RB, and with the equipment hatch removed. The licensee entered this issue into the corrective action program.

  Failure to comply with procedure OMP 1-18 is a performance deficiency. The finding is considered to be more than minor because the 1A2 RCP seal failures/leakage affected the initiating events cornerstone objective to limit the likelihood of those events that challenge critical safety functions during shutdown. The finding was determined to be of very low safety significance, based on the Phase 1 screening criteria in IMC 0609, because the 1A2 RCP seal leak would likely have not affected other mitigation systems or caused a loss of their safety function. This finding has a cross-cutting aspect in the Decision Making component of the Human Performance

area because the licensee used nonconservative assumptions when making decisions to take actions outside approved procedures [NRC Inspection Manual Chapter 0305, Section 06.07.c., H.1(b)]. (Section 4OA5.2b.(1))

- Green. The team identified a non-cited violation of Technical Specification 5.4.1 for failure to fully comply with procedure SOMP 04-02, Procedure Use and Adherence, during Unit 1 cooldown and depressurization activities. Specifically, AP/1/A/1700/016, Abnormal Reactor Coolant Pump Operation, was not properly implemented for identified seal failures on reactor coolant pumps (RCPs) 1A2 and 1B2, and a procedure change to AP/1/A/1700/016 was not processed prior to restarting RCP 1B2, as required by Nuclear System Directive (NSD) 703, Administrative Instructions for Technical Procedures. These actions resulted in missed opportunities to identify the progression of the 1A2 RCP seal leak and the RB iodine detector which was in alarm. The licensee entered this issue into the corrective action program.

  Failure to comply with procedures AP/1/A/1700/016 and NSD 703 is a performance deficiency. The finding is considered to be more than minor because not complying with the abnormal procedure used to address the RCP seal failures affected the initiating events cornerstone objective to limit the likelihood of those events that challenge critical safety functions during shutdown. The finding was determined to be of very low safety significance, based on the Phase 1 screening criteria in IMC 0609, because the 1A2/1B2 RCP seal failures and the 1A2 RCP seal leak would likely have not affected other mitigation systems or caused a loss of their safety function. This finding has a cross-cutting aspect of procedural compliance for failure to follow procedures, as described in the Work Practices component of the Human Performance cross-cutting area [NRC Inspection Manual Chapter 0305, Section 06.07.c., H.4(b)]. (Section 4OA5.2b.(3))

Cornerstone: Mitigating Systems

- Green. The team identified a non-cited violation of Technical Specification 5.4.1 for failure to properly implement procedure SOMP 04-02, Procedure Use and Adherence, during Unit 1 cooldown and depressurization activities. Specifically, the licensee made the decision not to enter procedure AP/1/A/1700/026, Loss of Decay Heat Removal, on two separate occasions when a condition required for entry was met (i.e., loss of reactor coolant system inventory while on LPI DHR), due to the seal leak which developed on the 1A2 RCP. These actions had the potential to impact the radiological risk to plant personnel if an unexpected change in the 1A2 RCP seal leak had occurred while personnel were inside the RB, and with the equipment hatch removed. The licensee entered this issue into the corrective action program.

  Failure to comply with abnormal procedure AP/1/A/1700/026 is a performance deficiency. The finding is considered to be more than minor because not complying with the abnormal procedure affected the mitigating systems objective to ensure the availability and capability of the LPI DHR system to respond to a RCP seal leak initiating event to prevent undesirable consequences. The finding was determined to be of very low safety significance, based on the Phase 1 screening criteria in IMC 0609, because the finding did not represent a loss of the LPI DHR system safety

function. This finding has a cross-cutting aspect in the Decision Making component of the Human Performance area because the licensee's decisions not to enter AP/1/A/1700/026 with a known RCP seal leak were based on judgement rather than the systematic process in procedure AP/1/A/1700/026 [NRC Inspection Manual Chapter 0305, Section 06.07c., H.1(a)]. (Section 4OA5.2b.(2))

- Green. The team identified a non-cited violation of Technical Specification 5.4.1 for failure to comply with procedure OMP 2-01, Duties and Responsibilities of On-Shift Operations Personnel, on two occasions during Unit 1 cooldown and depressurization activities. More specifically, plant cooldown was not performed within the limits of station procedures and response to a reactor building radiation alarm associated with a reactor coolant pump seal leak was untimely. These actions had the potential to impact the integrity of reactor coolant system components and increase the radiological risk to plant personnel. The licensee entered these issues into the corrective action program.

  Failure to comply with OMP 2-01 is a performance deficiency. This finding is considered to be more than minor because it impacted the mitigating systems cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The finding was determined to be of very low safety significance, based on the Phase 1 screening criteria in IMC 0609, because the cooldown limit did not exceed Technical Specification limits and radiation protection personnel determined from sampling that the RB radiation levels were minimal. This finding has a cross-cutting aspect in the Work Practices component of the Human Performance area because the licensee failed to maintain effective supervisory and management oversight of work activities [NRC Inspection Manual Chapter 0305, Section 06.07c., H.4(c)]. (Section 4OA5.2.b(4))

B. Licensee-Identified Violations

None.

REPORT DETAILS

Summary of Plant Event

Oconee Nuclear Station Unit 1 had shut down for the end-of-cycle (EOC)-24 refueling outage (RFO) with three of the four reactor coolant pumps (RCPs) operating. While performing plant cooldown and depressurization activities on April 12, 2008, in preparation for the RFO, Unit 1 experienced abnormally high vibrations on all three of the operating RCPs (i.e., sequentially on the 1B2, 1B1, and 1A2), as well as experienced an approximate 8 gallons per minute (gpm) leak from the 1A2 RCP seal package and other indications of degraded stages on the 1B2 RCP seal package. The fourth pump, RCP 1A1, had been secured and removed from service in late February 2008, prior to the end of the fuel cycle, due to a service water leak into the motor oil cooler. At the time the 1A2 RCP seal leak occurred, the plant was on low pressure injection (LPI) decay heat removal (DHR). The three operating RCPs had sequentially exhibited elevated vibration levels at different points in the cooldown and depressurization, which caused them to be secured.

The licensee's root cause analysis did not determine a specific root cause for the 1A2 and 1B2 RCP seal failures, but determined that the most probable cause was inadequate seal design. The root cause determined that upper rotating seal ring degradation/failure was the failure mode. Following failure of the upper rotating seal ring on the 1A2 RCP, the resultant debris slurry entered the middle stage seal causing it to fail. Particles continued to work their way lower in the seal package until finally damaging the lower seal. A similar failure mechanism was observed on the 1B2 RCP seals. Prior to the 1A2 and 1B2 RCP seal failures, there was a lack of procedural guidance to restrict operation of a RCP with a single seal stage failed. As a result of the failure mechanism identified for the middle and lower seal stages, the licensee revised its procedures to enhance the guidance regarding RCP operation with a failed seal stage.

Inspection Scope

Based on the deterministic and conditional risk criteria specified in NRC Management Directive 8.3, "NRC Incident Investigation Program," a Special Inspection was initiated in accordance with NRC Inspection Procedure 93812, "Special Inspection Team." The inspection reviewed the circumstances surrounding the Oconee Unit 1 cooldown and depressurization on April 12, 2008. Documents reviewed during the inspection are listed in Attachment 1 of this report. The inspection focus areas are listed in the Special Inspection Charter (Attachment 2).

4. OTHER ACTIVITIES

4OA5 Other Activities - Special Inspection (93812)

.1 Develop a complete description of the RCP high vibration and subsequent seal degradation/failure. This should include a sequence of events timeline, identifying operations and management decision points, from when the high RCP vibration and seal degradation was first identified until the last RCP was no longer needed and secured. (Charter Item 1)

Background Information

Synopsis

On April 12, 2008, Oconee Unit 1 was in Mode 3 performing a scheduled cool down and depressurization in preparation for the EOC-24 RFO. The reactor coolant system (RCS) was in an abnormal configuration, having only three RCPs running due to an unrelated issue that required RCP 1A1 to be secured earlier in the cycle. During the RCS depressurization, vibration increased sequentially on RCPs 1B2, 1B1, and 1A2 as RCS pressure was lowered. The vibration levels first increased on the 1B2 RCP to a point where it was required to be secured in accordance with procedure AP/1/A/1700/016, Abnormal Reactor Coolant Pump Operation. This procedure directs operators to secure a RCP if high vibration (15 mils) exist and continue to increase. It also directs operators to immediately secure a RCP if the emergency high vibration (20 mils) is reached. Subsequently, the vibrations on RCP 1B1 resulted in it being secured in accordance with AP/1/A/1700/016. In order to complete the RCS cooldown and establish LPI DHR prior to tripping the last running RCP, the vibration trip criteria for RCP 1A2 was raised by operations based on guidance from engineering. During subsequent operation after LPI DHR was established, RCP 1A2 seals degraded. Following indications of seal failure/leakage, RCP 1A2 was secured. After RCP 1A2 was secured, its seal failure developed into an RCS leak of approximately 8 gpm over an eight hour period.

To facilitate RCS degas and crud-burst, RCP 1B2 was restarted. In between the time when the leak on RCP 1A2 was discovered and RCP 1B2 was restarted, the containment equipment hatch was removed. When the 1B2 RCP was restarted, its upper seal failed almost immediately. The 1B2 RCP seals continued to degrade and, after failure of the middle seal, the pump was secured.

RCP 1A2 Seal Failures

After RCPs 1B2 and 1B1 were secured due to high spool piece vibration, RCP 1A2 exhibited the same pattern of vibration change during the RCS depressurization. The licensee concluded that based on the vibration rate of increase, RCP 1A2 vibration levels would reach the immediate trip criteria of 20 mils, specified in AP/1/A/1700/016, before reaching the LPI DHR entry conditions. Consequently, the licensee consulted the RCP pump/motor vendor, reviewed the RCP seal vendor manual to obtain guidance for operating RCP 1A2 at vibration levels higher than allowed by procedures, and applied the guidance of procedure OMP 1-18, Implementation Standards During Abnormal and Emergency Events. OMP 1-18 allows actions to be taken outside of procedures during abnormal or emergency events only to place the plant in a safe/stable condition. AP/1/A/1700/016 required an immediate trip of a RCP if vibration levels reached 20 mils. The decision was made to allow RCP 1A2 to operate with up to 25 mils of vibration before requiring a trip of the pump to facilitate depressurizing and cooling down the RCS in order to initiate LPI DHR. LPI DHR was initiated after operating the RCP approximately 1½ hours with the expanded vibration limits. After 3½ hours of operating RCP 1A2 with the expanded vibration limit, its upper seal failed. This was followed by the failure of the middle seal, forty minutes later. During each seal failure, the seals responded as expected and differential pressure across the remaining seal(s) increased accordingly. Approximately forty minutes after the second seal failed, engineering identified the failures of the RCP seals and recommended to the operating crew that RCP 1A2 be secured. The operations shift manager (OSM) concurred with

recommendation and directed the control room operators to secure RCP 1A2. After RCP 1A2 was secured, the licensee did not enter AP/1/A/1700/016 for an identified seal failure. In addition to providing guidance on securing a RCP due to seal failure, AP/1/A/1700/016 also required continuous monitoring of indications for RCS leakage.

RCP 1A2 Seal Leak

After RCP 1A2 was secured, evidence of water overflowing from its motor stand was reported by operations personnel in the reactor building (RB). The outage control center (OCC) initially estimated the leak rate to be 0.3 gpm. Based on this, the licensee inappropriately determined that entry into procedure AP/1/A/1700/026, Rev. 20, Loss of Decay Heat Removal, was not required. The entry conditions for AP/1/A/1700/026 included loss of RCS inventory while on DHR, and the licensee believed this leak was not large enough to meet the entry condition. Subsequent review of plant data showed that the RCP 1A2 seal leak was greater than the 0.3 gpm leak that was initially reported by the OCC. Reactor building normal sump (RBNS) rate and radiation monitor 1RIA-48, Reactor Building Iodine Detector, level increases were consistent with a leak of increasing magnitude. The leak rate increased over time to a maximum of approximately 8-10 gpm, which was corroborated by plant inventory balance data. During the progression of the leak, 1RIA-48 increased to above its alarm limit, but this was not identified by the operators. During this period, work continued in the RB and the equipment hatch was removed. Approximately eight hours after the leak was estimated at 0.3 gpm, the leak rate was reevaluated and identified to be approximately 8 gpm. The licensee once again inappropriately decided not to enter AP/1/A/1700/026, basing their decision on the leak not posing a threat to LPI DHR capabilities and, therefore, entry into AP/1/A/1700/026 was not required. In addition to mitigating a potential loss of LPI DHR, AP/1/A/1700/026 required the RB equipment hatch to be immediately shut and RB closure to be established for the given plant conditions. Over nine hours after 1RIA-48 went into alarm, it was identified by the operating crew and operators entered AP/1/A/1700/018, Rev. 15, Abnormal Release of Radiation. Instead of sounding the RB evacuation alarm as required by AP/1/A/1700/018, some personnel were escorted from the RB while others were allowed to continue working inside the RB.

RCP 1B2 Seal Failures

Plant management convened a Plant Operations Review Committee (PORC) meeting to discuss the restart of RCP 1B2 for the purpose of RCS degas and crud burst. The PORC approved restarting RCP 1B2 and discussed raising the immediate trip criteria of AP/1/A/1700/016 for emergency high RCP vibration from 20 mils to 25 mils. The operating crew was briefed on the decision to operate RCP 1B2 with the raised trip criteria prior to restarting the RCP. Procedure changes were not processed and actual alarm set points were not changed. Almost immediately after starting RCP 1B2, its upper seal failed. The operating crew entered AP/1/A/1700/016 for the indications of a seal failure. Approximately one hour later, the middle seal also failed and RCP 1B2 was secured. The operating crew did not monitor the plant parameters as required by Step 7 of Section 4A of AP/1/A/1700/016, based on indications that RCP 1B2 did not have a failure of all three seals. The parameters that were required to be monitored would have alerted the operators to radiation monitor 1RIA-48 being in alarm and the increased leak rate of RCP 1A2 that the operators were unaware of.

Time Line

April 12, 2008

[Hours]

0315 The operating crew was performing a RCS depressurization and cooldown per OP/1/A/1102/010 following Unit 1 shutdown when sustained abnormally high vibrations on RCP 1B2 were noted. AP/1/A/1700/016, Abnormal Reactor Coolant Pump Operation, was entered.

0321 Secured RCP 1B2 per AP/1/A/1700/016 due to high vibration alarm with increasing vibrations.

0448 The operating crew was continuing with the RCS depressurization per OP/1/A/1102/010 when the conditions for the high vibration alarm on RCP 1B1 (1SA-9/D-2, RC PUMP VIBRATION HIGH) were met. The operating crew entered AP/1/A/1700/016 and stopped the RCS depressurization. RCP 1B1 vibrations stabilized just below the high alarm setpoint of 15 mils.

0457-0507 The depressurization was recommenced and RCP 1B1 vibrations again increased above the high alarm setpoint and continued to increase until they stabilized at approximately 17 mils.

0639-0640 RCP 1B1 vibrations increased above the emergency high alarm setpoint of 20 mils. The operating crew reentered AP/1/A/1700/016 and secured RCP 1B1 due to meeting the immediate trip criteria of Enclosure 5.1.

0713 The operating crew was continuing with the RCS depressurization when the conditions for the high vibration alarm on RCP 1A2 (1SA-9/D-2, RC PUMP VIBRATION HIGH) were met. Depressurization was stopped and RCP 1A2 vibrations stabilized just below the high alarm setpoint of 15 mils.

0820 Depressurization was recommenced.

0825 Conditions for the high vibration alarm on RCP 1A2 were once again met. Vibrations continued to increase and stabilized at approximately 18 mils over the next 5 minutes.

0835-0837 The crew entered AP/1/A/1700/016 and stabilized RCS pressure at 300 psig. Engineering was contacted.

0847 Increased RCS pressure to 315 psig to assist in maintaining RCP 1A2 spool piece vibration below 20 mils.

1103-1105 Operations received guidance from engineering to continue operation of RCP 1A2 with the trip limit increased from 20 mils to 25 mils on spool piece vibration. The crew began depressurization of the RCS to place LPI DHR in service.

1112 RCP 1A2 spool piece vibration reached 20 mils and stabilized at 21 mils. Pump operation was allowed to continue based on engineering guidance and OMP 1-18 Attachment G criteria.

1125 Began RCS temperature decrease to 235 °F (entered Mode 4).

1220 Started LPI pump 1A for DHR.

1344 Entered Mode 5 – RCS temperature 200 °F.

1400-1424 Cooldown limits of procedure OP/1/A/1102/010 were exceeded (i.e., ≤ 20 °F in any 30 minute period). Cooldown rate was 20 °F - 24 °F/30minutes [Technical Specification (TS) limit was ≤ 25 °F in any 30 minute period].

1449 RCP 1A2 upper seal indicated signs of failure with a loss of upper seal differential pressure. The middle and lower seals' differential pressures increased to compensate for the loss of the upper seal.

1528 RCP 1A2 middle seal indicated signs of failure with a loss of middle seal differential pressure. The lower seal differential pressure increased to compensate for the loss of the middle seal.

1605 Increased seal cavity pressure and seal return temperature on RCP 1A2 were identified by the operating crew. Engineering was notified.

1610 RCP 1A2 was secured at the direction of the OSM and recommendation from engineering due to indications of a seal leak. The recommendation was based on indications of elevated seal return temperature and seal cavity pressure.

1615 Nuclear equipment operator reported indication of water accumulation at the standpipe for RCP 1A2 and evidence of water overflowing from the pump motor stand.

1800 Shift Turnover.

1904 1RIA-48 Alert Alarm (not initially recognized by operating crew).

2116 RB equipment hatch removed.

2258 Started RCP 1B2 with increased emergency high vibration limit of 25 mils - upper seal failure indications soon after pump start.

2300 Entered AP/1/A/1700/016 due to sustained high vibration on RCP 1B2.

2330 Re-entered AP/1/A/1700/016 due to indications of RCP 1B2 upper seal failure.

April 13, 2008

0025 Indicated signs of two seal failures on RCP 1B2 and potential failure of a third seal. Secured RCP 1B2.

0030 The 1B2 RCP seal was inspected after pump shutdown and no additional leakage was observed coming from the 1B2 RCP seal. Previously identified leakage from RCP 1A2 seal was quantified to be approximately 8 gpm. Referred to AP/1/A/1700/026 and entry conditions were determined to not apply based on plant status at that time.

0207 Completed RCS degas per OP/1/A/1102/012.

0428-0540 Operators identified 1RIA-48 in alarm and entered AP/1/A/1700/018, Abnormal Release of Radiation. Reactor building evacuated at 0540 because of iodine.

.2 Determine if operational decision making was appropriate in terms of operating pump combinations during shutdown, continuing to operate the 1A2 RCP with high vibrations, and to restart the 1B2 RCP (Charter Item 2)

a. Inspection Scope

The team reviewed plant data, operator logs, Problem Investigation Process reports (PIP), PORC meeting minutes, TS, plant procedures, and held discussions with plant staff and management to determine the appropriateness of the licensee's actions and decisions during the Unit 1 cooldown and depressurization.

b. Findings and Observations

(1) Decision to Use Procedure OMP 1-18 Guidance

Introduction: The team identified a Green non-cited violation (NCV) of TS 5.4.1 for failure to properly implement procedure OMP 1-18, Implementation Standard During Abnormal and Emergency Events, which allows actions to be taken outside of procedures during abnormal or emergency events only to place the plant in a safe/stable condition. Contrary to the requirements of OMP 1-18, the licensee took actions outside abnormal operating procedures (APs) on two occasions during Unit 1 cooldown and depressurization activities, after the plant was already in a safe/stable condition on LPI DHR. The first occasion involved the continued operation of RCP 1A2 at vibration levels above the trip setpoint in AP/1/A/1700/016, Abnormal Reactor Coolant Pump Operation, on April 12, 2008, after establishing LPI DHR. Approximately 2½ hours later, the 1A2 RCP began to fail and a seal leak developed. The second occasion involved RB iodine detector 1RIA-48 that was discovered in alarm on April 13, 2008, due to the 1A2 RCP seal leak that was in progress. The RB evacuation alarm was not sounded as required by procedure AP/1/A/1700/018, Abnormal Release of Radioactivity, and some personnel were allowed to continue working inside the RB. As such, these actions had the potential to increase the radiological risk to plant personnel if an unexpected change in the 1A2 RCP seal leak had occurred while personnel were inside the RB, and with the

equipment hatch removed. The licensee initiated PIP O-08-3572 to address this issue in the corrective action program.

Description: On April 12, 2008, Unit 1 was in Mode 3 performing a scheduled cooldown and depressurization in preparation for the 1EOC-24 RFO with one RCP running. RCP 1A2 was the only RCP running after RCPs 1B2 and 1B1 had been secured due to high vibration and RCP 1A1 had been secured in late February 2008 for a service water leak in a lube oil cooler. As RCS pressure was decreased, vibrations on RCP 1A2 began to increase in a similar manner to RCPs 1B2 and 1B1. The operating crew recognized that achieving the required pressure to initiate LPI DHR would not be possible without exceeding the required trip criteria of AP/1/A/1700/016 for vibrations on RCP 1A2. In order to complete the RCS cooldown and establish LPI DHR without tripping the last running RCP, the licensee used the guidance in Attachment G of OMP 1-18 to effectively increase the trip criteria of AP/1/A/1700/016 without changing the procedure. RCS temperature and pressure were decreased and LPI DHR was established with RCP 1A2 operating above the vibration trip criteria specified in AP/1/A/1700/016. After LPI DHR had been established, which placed the plant in a safe/stable condition, the licensee continued operation of RCP 1A2 with vibrations above required trip levels of AP/1/A/1700/016 to support RCS degas and crud burst until RCP 1A2 experienced seal leakage due to failure of all three seals. Only after indication of seal failure/leakage was RCP 1A2 secured. When making the decision to continue operating RCP 1A2 after LPI DHR was established, the licensee made the assumption that the RCP 1A2 seals would not be adversely affected by operation at elevated vibrations based on previous operation of the Unit 1 RCPs under similar conditions in 1997. However, the team determined that the licensee's assumption was nonconservative in that the Unit 1 RCPs had a different seal package vendor and seal design in 1997.

Additionally, on April 13, 2008, the licensee once again used the guidance from OMP 1-18 to change the implementation of AP/1/A/1700/018. When 1RIA-48 (Reactor Building Iodine Detector) was discovered in an alarm condition, the licensee used OMP 1-18, Attachment G, to not perform AP/1/A/1700/018, Section 4I, Step 2, Verify RB Evacuation Alarm Sounded. Operator logs stated that the RB evacuation alarm was not sounded to prevent personnel from being injured while evacuating the RB. Licensee personnel inside the RB were evacuated by radiation protection (RP) personnel with the exception of operators performing work for plant cooldown and depressurization. When making the decision not to sound the RB evacuation alarm, the licensee made the assumption that the risk of personnel injury while evacuating the RB was greater than the possible risk from an RCS leak with a valid RB radiation alarm. The team concluded that these actions had the potential to increase the radiological risk to plant personnel if an unexpected change in the 1A2 RCP seal leak had occurred while personnel were inside the RB, and with the equipment hatch removed. The licensee also made the assumption that the current monitoring in the RB by RP personnel mitigated the requirement for RB evacuation.

OMP 1-18, Attachment G, states that actions outside of procedures during abnormal or emergency events may only be taken to place the plant in a safe/stable condition. The decisions to continue operation of RCP 1A2 after the RCS was on LPI DHR, as well as not sounding the RB evacuation alarm, were viewed to be based on non-conservative assumptions and not meeting the criteria of OMP 1-18, Attachment G, for performing

actions outside of procedures during abnormal or emergency events. In both instances, the plant was already in a safe/stable condition when the actions outside of approved procedures were performed.

Analysis: Failure to comply with procedure OMP 1-18 is a performance deficiency. The finding is considered to be more than minor because the 1A2 RCP seal failures/leakage affected the initiating events cornerstone objective to limit the likelihood of those events that challenge critical safety functions during shutdown. The finding was determined to be of very low safety significance (Green), based on the Phase 1 screening criteria in IMC 0609, because the 1A2 RCP seal leak would likely have not affected other mitigation systems or caused a loss of their safety function. This finding has a cross-cutting aspect in the Decision Making component of the Human Performance area because the licensee used nonconservative assumptions when making decisions to take actions outside approved procedures [NRC Inspection Manual Chapter 0305, Section 06.07c., H.1(b)].

Enforcement: Technical Specification 5.4.1.a requires that written procedures shall be established, implemented, and maintained covering the activities in Appendix A of Regulatory Guide (RG) 1.33, Revision 2. Section 5 of RG 1.33 requires procedures for abnormal or alarm conditions. Licensee procedure OMP 1-18, Implementation Standard During Abnormal and Emergency Events, Attachment G, states that actions outside procedures during abnormal or emergency events may only be taken to place the plant in a safe/stable condition. Contrary to the above, the licensee failed to properly implement the requirements of procedure OMP 1-18 on two different occasions as indicated below:

- On April 12, 2008, the licensee used OMP 1-18 guidance to allow RCP 1A2 to continue to be operated for RCS degassing and crud-burst with RCP vibrations exceeding the immediate trip criteria of AP/1/A/1700/016, Abnormal Reactor Coolant Pump Operation, after the RCS had been placed on LPI DHR and the plant was in a safe and stable condition. As such, while continuing to perform RCS degassing and crud-burst, RCP 1A2 experienced failure of all three seals and a seal leak. After the pump was secured, the seal leak continued to increase over the next eight hours to approximately 8 gpm.

- On April 13, 2008, the licensee used OMP 1-18 guidance again to deviate from the requirements of procedure AP/1/A/1700/018, Abnormal Release of Radioactivity, to not activate the RB evacuation alarm and to not evacuate all personnel from containment with a valid RB RIA alarming. At the time when the licensee made the decision to deviate from OMP 1-18, the RCS had been placed on LPI DHR and the plant was already in a safe/stable condition.

Because this finding is of very low safety significance and was entered into the licensee's corrective action program, this finding is being treated as a NCV, consistent with Section VI.A.1 of the NRC's Enforcement Policy: NCV 05000269/2008008-01, Failure to Comply with Procedure OMP 1-18 by Overriding Abnormal Procedure Requirements Beyond the Point of Placing the Plant in a Safe/Stable Condition.

(2) Decision Not to Enter Abnormal Procedure

Introduction: The team identified a Green NCV of TS 5.4.1 for failure to properly implement procedure SOMP 04-02, Procedure Use and Adherence, during Unit 1 cooldown and depressurization activities. Specifically, the licensee made the decision not to enter procedure AP/1/A/1700/026, Loss of Decay Heat Removal, on two separate occasions when a condition required for entry was met (i.e., loss of RCS inventory while on LPI DHR), due to the seal leak which developed on the 1A2 RCP. These actions had the potential to impact the radiological risk to plant personnel if an unexpected change in the 1A2 RCP seal leak had occurred while personnel were inside the RB, and with the equipment hatch removed. The licensee initiated PIP O-08-3572 to address this issue in the corrective action program.

Description: While performing RCS degas and crud burst activities on April 12, 2008, RCP 1A2 experienced degradation on all three stages of the seal package and seal leakage from the 1A2 RCP seal package. After RCP 1A2 was secured, evidence of water overflowing from the 1A2 RCP motor stand was reported by operations personnel in the RB. The OCC personnel initially estimated the leak rate to be 0.3 gpm. Based on this, the operators determined that entry into AP/1/A/1700/026, Rev. 20, Loss of Decay Heat Removal, was not required. The entry conditions for AP/1/A/1700/026 included loss of RCS inventory while on DHR, and the operators believed this leak was not large enough to meet the entry condition. Subsequent review of plant data showed that the 1A2 RCP seal leak was greater than the 0.3 gpm that was initially reported to the control room. RBNS rate and 1RIA-48 (Reactor Building Iodine Detector) level increases were consistent with a leak of increasing magnitude. During the progression of the leak, 1RIA-48 increased to above its alarm limit, but was not noticed by the operators. During this period, work activities in preparation for the 1EOC-24 RFO continued in the RB, based in part on the assumption that the 1A2 RCP seal leak was 0.3 gpm. The RB equipment hatch was removed and the licensee made the decision to restart RCP 1B2 in order to complete the RCS degas and crud burst that had been suspended earlier due to RCP 1A2 seal failure/leakage. Approximately eight hours after the 1A2 RCP seal leak was estimated at 0.3 gpm, the leak rate was reevaluated and identified to be approximately 8 gpm, which was corroborated by plant inventory balance data. The licensee once again decided not to enter AP/1/A/1700/026, basing the decision on the leak not posing a threat to LPI DHR capabilities and, therefore, entry into AP/1/A/1700/026 did not apply. The team reviewed the entry conditions for AP/1/A/1700/026 and concluded that the 1A2 RCP seal leakage met the entry conditions because AP/1/A/1700/026 did not specify minimum leakage values for entry. In addition to mitigating a potential loss of LPI DHR, AP/1/A/1700/026 also required the RB equipment hatch to immediately be shut and RB closure to be established for the given plant conditions.

Analysis: Failure to comply with abnormal procedure AP/1/A/1700/026 is a performance deficiency. The finding is considered to be more than minor because not complying with the abnormal procedure affected the mitigating systems objective to ensure the availability and capability of the LPI DHR system to respond to a RCP seal leak initiating event to prevent undesirable consequences. The finding was determined to be of very low safety significance (Green), based on the Phase 1 screening criteria in IMC 0609, because the finding did not represent a loss of the LPI DHR system safety function. This

finding has a cross-cutting aspect in the Decision Making component of the Human Performance area because the licensee's decisions not to enter AP/1/A/1700/026 with a known RCP seal leak were based on judgement rather than the systematic process in procedure AP/1/A/1700/026 [NRC Inspection Manual Chapter 0305, Section 06.07.c., H.1(a)].

Enforcement: Technical Specification 5.4.1 requires that written procedures shall be established, implemented, and maintained covering the activities in Appendix A of RG 1.33, Revision 2. Licensee procedure SOMP 04-02, Procedural Use and Adherence, Section 7, requires that plant activities be performed in accordance with approved procedures. AP/1/A/1700/026, Loss of Decay Heat Removal, requires entry into the abnormal procedure and specifies actions to be performed for a loss of RCS inventory while on LPI DHR.

Contrary to the above, the requirements of AP/1/A/1700/026 were not complied with when the licensee made the decision not to enter AP/1/A/1700/026 on two separate occasions (once on April 12, 2008, and again on April 13, 2008) when a condition required for entry was met (i.e., loss of RCS inventory while on LPI DHR) due to the seal leak which developed on the 1A2 RCP. Because this finding is of very low safety significance and was entered into the licensee's corrective action program, this finding is being treated as a NCV, consistent with Section VI.A.1 of the NRC's Enforcement Policy: NCV 05000269/2008008-02, Failure to Enter AP/1/A/1700/026 for a Loss of RCS Inventory from a Seal Leak Which Developed on the 1A2 RCP.

(3) Procedure Compliance

Introduction: The team identified a Green NCV of TS 5.4.1 for failure to fully comply with procedure SOMP 04-02, Procedure Use and Adherence, during Unit 1 cooldown and depressurization activities. Specifically, AP/1/A/1700/016, Abnormal Reactor Coolant Pump Operation, was not properly implemented for identified seal failures on reactor coolant pumps (RCPs) 1A2 and 1B2, and a procedure change to AP/1/A/1700/016 was not processed prior to restarting RCP 1B2, as required by Nuclear System Directive (NSD) 703, Administrative Instructions for Technical Procedures. These actions resulted in missed opportunities to identify the progression of the 1A2 RCP seal leak and the RB iodine detector which was in alarm. The licensee initiated PIP O-08-3572 to address this issue in the corrective action program.

Description: While operating RCP 1A2 on April 12, 2008, for RCS degassing and crud burst, its upper seal failed, followed by the failure of the middle seal forty minutes later. During each seal failure, the seals responded as expected and differential pressure across the remaining seal(s) increased accordingly. Approximately forty minutes after the second seal failed, engineering identified the failures of the RCP seals and recommended to the operating crew that RCP 1A2 be secured. The OSM concurred with engineering's recommendation and directed the control room operators to secure RCP 1A2. After RCP 1A2 was secured, the licensee did not enter AP/1/A/1700/016, Abnormal Reactor Coolant Pump Operation, for an identified seal failure. In addition to providing guidance on securing a RCP due to seal failure, AP/1/A/1700/016 also required continuous monitoring of indications for RCS leakage. The team noted that not entering AP/1/A/1700/016 was a missed opportunity to potentially identify the magnitude

of the RCP seal leak and the high radiation alarm 1RIA-48 before opening the RB equipment hatch.

The licensee convened a PORC meeting to discuss the restart of RCP 1B2 for the purpose of completing RCS degassing and crud burst. The PORC approved restarting RCP 1B2 and discussed raising the immediate trip criteria for high vibration from 20 to 25 mils. Licensee personnel indicated that the decision to restart RCP 1B2 was partially based on the assumption that the leakage from RCP 1A2 was still 0.3 gpm. The team determined that the licensee did not question nor reverify the seal leakage from RCP 1A2, even though it had been several hours since the initial leakage was estimated. The team further noted that operational decisions were being made based on the assumed RCP 1A2 leakage of 0.3 gpm, and a procedure change was not processed nor were actual alarm setpoints changed. The operating crew was briefed on the decision to operate RCP 1B2 with the raised trip criteria prior to restarting the RCP. The team determined that this verbal change to the emergency high vibration immediate trip criteria for procedure AP/1/A/1700/016 was not in accordance with NSD 703, which required a procedure change and a 10 CFR 50.59 screening review to be performed.

During the restart of RCP 1B2, its upper seal failed almost immediately after the start. The operating crew entered AP/1/A/1700/016 for the indications of an upper seal failure. Approximately one hour later, the middle seal also failed and RCP 1B2 was secured. Although AP/1/A/1700/016 was entered when the upper seal failed, the operating crew did not monitor the plant parameters as required by Step 7 of Section 4A of AP/1/A/1700/016, based on indications that RCP 1B2 did not have a failure of all three seals. The team discovered that the parameters which were required to be monitored would have alerted the operators to radiation monitor 1RIA-48 being in alarm and the increased leak rate of RCP 1A2 that the operators were unaware of.

Analysis: Failure to comply with procedures AP/1/A/1700/016 and NSD 703 is a performance deficiency. The finding is considered to be more than minor because not complying with the abnormal procedure used to address the RCP seal failures affected the initiating events cornerstone objective to limit the likelihood of those events that challenge critical safety functions during shutdown. The finding was determined to be of very low safety significance (Green), based on the Phase 1 screening criteria in IMC 0609, because the 1A2/1B2 RCP seal failures and the 1A2 RCP seal leak would likely have not affected other mitigation systems or caused a loss of their safety function. This finding has a cross-cutting aspect of procedural compliance for failure to follow procedures, as described in the Work Practices component of the Human Performance cross-cutting area [NRC Inspection Manual Chapter 0305, Section 06.07.c., H.4(b)].

Enforcement: Technical Specification 5.4.1 requires that written procedures shall be established, implemented, and maintained covering the activities in Appendix A of RG 1.33, Revision 2. Licensee procedure SOMP 04-02, Procedural Use and Adherence, Section 7, requires that plant activities be performed in accordance with approved procedures. AP/1/A/1700/016, Abnormal Reactor Coolant Pump Operation, was required to be entered for an identified RCP seal failure and indications were required to be continuously monitored for RCS leakage. NSD 703, Administrative Instructions for Technical Procedures, requires a procedure change request and a 10 CFR 50.59 screening review be processed for changes to procedures.

Contrary to the above, on April 12, 2008:

- The licensee did not enter AP/1/A/1700/016 when the entry conditions were met after valid indications of a seal failures on RCP 1A2.

- PORC approved restarting RCP 1B2 to complete RCS degas and crud burst. AP/1/A/1700/016 was verbally changed (i.e., RCP 1B2 immediate trip criteria increased from 20 to 25 mils) without processing a procedure change and performing a 10 CFR 50.59 screening review as required by NSD 703.

- The licensee did not perform or monitor conditions required by Section 4A, Step 7 of AP/1/A/1700/016 after indications of the 1B2 RCP upper and middle seal failures. This was a missed opportunity for identification of the increasing RCS leakage from 1A2 RCP and earlier identification of the High Radiation Alarm RIA-48.

Because this finding is of very low safety significance and was entered into the licensee's corrective action program, this finding is being treated as a NCV, consistent with Section VI.A.1 of the NRC's Enforcement Policy: NCV 05000269/2008008-03, Failure to Fully Comply With Procedure SOMP 04-02 and Fully Implement or Formally Change the Requirements of AP/1/A/1700/016.

(4) Monitoring Plant Parameters

Introduction: The team identified a Green NCV of TS 5.4.1 for failure to comply with procedure OMP 2-01, Duties and Responsibilities of On-Shift Operations Personnel, on two occasions during Unit 1 cooldown and depressurization activities. More specifically, plant cooldown was not performed within the limits of station procedures and response to a RB radiation alarm associated with a RCP seal leak was untimely. These actions had the potential to impact the integrity of RCS components and increase the radiological risk to plant personnel. The licensee initiated PIPs O-08-3206 and O-08-3572 to address these issues in their corrective action program.

Description: During RCS cooldown and depressurization on April 12, 2008, RCS cooldown was required to be limited to a maximum of 20 °F in any half hour period in accordance with OP/1/A/1102/010, Controlling Procedure for Unit Shutdown, and OP/0/A/1108/001, Curves and General Information. The team reviewed plant data from 1400-1424 hours which showed cooldown rates in excess of 20 °F/30 minutes with a maximum of 24 °F/30 minutes. This was not recognized by the operators and was not identified by the licensee during their review of the shutdown events. Procedure OMP 2-01, Duties and Responsibilities of On-Shift Operations Personnel, requires that plant operations be performed within the limits of station procedures. The team noted that the TS limit (less than 25 °F/30 minute period) was not exceeded.

Additionally, during the RCS cooldown and depressurization, 1RIA-48, reactor building iodine detector indication increased and reached its high alarm setpoint due to the 1A2 RCP seal leak that was in progress. The alarm was initially received in the control room at 1904 hours. However, the control room operators did not notice the alarm and did not respond in accordance with procedure AP/1/A/1700/018, Abnormal Release of Radioactivity, for over 9 hours. The alarm remained actuated and the indication

continued to increase until 0428 hours on April 13, 2008, when the operating crew identified the alarm and responded in accordance with procedure AP/1/A/1700/018. Procedure OMP 2-01 requires that alarms be acknowledged in a timely manner and actions taken as identified in their respective Alarm Response Guide (ARG).

The team's reviews determined that attention was focused on activities related to entering the refueling outage. This contributed to less than rigorous compliance with important response procedures when unexpected conditions were experienced during the plant cooldown and depressurization. The licensee's assessment of the event indicated that there was inappropriate prioritization of outage activities rather than adequately monitoring the developing RCP seal leakage. The licensee's observations were consistent with the team's conclusions. The licensee initiated PIPs O-08-3206 and O-08-3572 to address these issues in the corrective action program.

Analysis: Failure to comply with OMP 2-01 is a performance deficiency. This finding is considered to be more than minor because it impacted the mitigating systems cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The finding was determined to be of very low safety significance (Green), based on the Phase 1 screening criteria in IMC 0609, because the cooldown limit did not exceed Technical Specification limits and radiation protection personnel determined from sampling that the RB radiation levels were minimal. This finding has a cross-cutting aspect in the Work Practices component of the Human Performance area because the licensee failed to maintain effective supervisory and management oversight of work activities [NRC Inspection Manual Chapter 0305, Section 06.07.c., H.4(c)].

Enforcement: Technical Specification 5.4.1 requires that written procedures shall be established, implemented, and maintained covering the activities in Appendix A of RG 1.33, Revision 2. These activities include procedures for plant shutdown from hot standby to cold shutdown and procedures for abnormal and alarm conditions. Procedure OMP 2-01 requires that plant operations be performed within the limits of station procedures. This procedure also requires that alarms be acknowledged in a timely manner and actions taken as identified in their respective ARG.

Contrary to the above, the team identified two instances where the licensee did not comply with the requirements of procedure OMP 2-01 during RCS cooldown and depressurization activities on April 12, 2008:

- On April 12, 2008, the licensee failed to operate the plant within the limits specified in procedures OP/1/A/1102/010 and OP/0/A/1108/001, in that, the specified RCS cool down rate of ≤ 20 °F in any ½ hour period was exceeded.

- On April 12, 2008, the licensee acknowledged a High Radiation Alarm (1RIA-48), but did not identify it as alarming and did not respond in accordance with abnormal procedure AP/1/A/1700/018, Abnormal Release of Radioactivity, for over 9 hours.

Because this finding is of very low safety significance and was entered into the licensee's corrective action program, this finding is being treated as a NCV, consistent

with Section VI.A.1 of the NRC's Enforcement Policy: NCV 05000269/2008008-04, Failure to Comply with Procedure OMP 2-01 When Monitoring Plant Parameters.

.3 Evaluate the adequacy of the licensee's root cause. Determine if the licensee understands the seal failure mechanism and RCP vibration phenomenon prior to restart, as well as what impact (if any) the extended operation and/or subsequent cooldown of the plant without the 1A1 RCP may have had. This effort should include a review of any operational anomalies in the past cycle(s) that could be a potential precursor. (Charter Item 3)

a. Inspection Scope

The inspectors reviewed PIP O-08-1940, which was being used to track the root cause analysis of the 1A2 and the 1B2 RCP seal failures. Interviews were conducted with plant operations, maintenance, and engineering personnel, as well as with their supervisors and managers. Plant operating logs/data, procedures, and maintenance records were also reviewed.

b. Findings and Observations

No findings of significance were identified.

Oconee Unit 1 RCPs are unique, being the only Westinghouse RCPs with the Sulzer seals. The seal package is a three stage design with seal injection flow introduced below the RCP radial bearing (most RCPs introduce seal injection flow above the radial bearing). Prior to the seal failures on the 1A2 and 1B2 RCPs, the plant was cooling down and depressurizing using an allowed, but unusual, RCP alignment. Normally the 1A1 RCP would be the last RCP secured during the cooldown since the pressurizer spray line comes off the 1A1 loop and the 1A1 RCP is balanced for operations at low pressure. The 1A1 RCP was not available, having been secured earlier in the operating cycle due to a leak on its motor oil cooler.

The licensee established a root cause investigation team that consisted of personnel from the plant, corporate engineering, contractors, and the RCP/seal vendors. The root cause investigation team developed a matrix of 65 potential failure modes. Each potential failure mode was then evaluated and dispositioned in PIP O-08-1940 as one of the following:

- A failure mode
- A contributing factor
- Indeterminate
- A most probable cause
- Refuted

The root cause analysis did not determine a specific root cause for the RCP seal failures, but determined that upper rotating seal ring degradation/failure was the failure mode. The seal packages on all four RCPs were removed and inspected. Heat checking was observed on the failed upper rotating seal rings for the 1A2 and the 1B2

RCPs. Heat checking was also observed on the 1A1 RCP upper rotating seal ring. Since the 1A1 RCP had been secured approximately 1½ months prior to the shutdown, this prompted the licensee to conduct a detailed review of the RCP seal parameters for previous operating cycles. During the previous two operating cycles, the licensee identified periods where the 1A1, 1A2, and 1B2 RCPs had experienced higher than normal seal return temperatures (i.e., RCPs 1A1 and 1A2 during the most recent operating cycle 24 and RCP 1B2 during the previous operating cycle 23). It was discerned that heat checking of the upper seal rings occurred during those periods of elevated seal return temperature. At normal operating temperature and pressure, the rotating seal rings were in a state of compression (i.e., differential pressure across the seal was greater than the centrifugal force). During plant cooldown and depressurization, there was a point where the differential pressure across the upper seals was reduced enough that the rotating tungsten carbide rings were no longer in compression. At that point, it was believed that the centrifugal force was sufficient to cause the damaged upper rotating seal rings to fail catastrophically. Following the failure of the upper rotating seal ring on the 1A2 RCP, tungsten carbide pieces caused failure of the upper carbon stationary ring. A heavy slurry of tungsten carbide and carbon particles scoured the outside of the RCP shaft, the inside of the shaft sleeve, and entered the middle stage seal causing it to fail. Particles continued to work their way lower in the seal package until finally damaging the lower seal. A similar failure mechanism was observed in the 1B2 RCP. Because the 1B2 RCP was secured soon after the upper seal failure was detected, only the middle seal was damaged and the lower remained intact. The licensee's root cause investigation determined that the most probable causes for the failure of the 1A2 and 1B2 RCP seals was inadequate seal design:

- Inadequate staging flow for cooling and seal stability
- Lack of a large heat sink (stand pipe) on upper stage seal
- Interface design issues with Westinghouse pumps (Oconee Unit 1 is the only plant with Westinghouse RCPs and the Sulzer seal package)
- Sleeve restraint leading to adverse stationary/rotating seal interface

The elevated vibration of the RCPs was determined to be a minor contributing factor to the RCP seal failures (i.e., potentially contributed to existing heat checked crack propagation). The RCP vibration levels experienced during previous shutdown evolutions were not as significant as the sustained high and emergency high levels experienced during the cooldown and depressurization on April 12, 2008. This is primarily due to normally securing RCPs 1B1 and 1B2 while still up in pressure and temperature, then followed by RCP 1A2. Plant cooldown and degas activities are typically accomplished with RCP 1A1 because, unlike the other three RCPs, it is balanced for low pressure operation. Cooldown and depressurization activities on April 12, 2008, was initiated with the three operating RCPs in order to allow observation of the motors in operation to assist in identifying potential oil leaks. The plant would normally be in two RCP operations below 500 °F. The normal practice of securing the 1B1 and 1B2 RCPs early in the end-of-cycle shutdown activities explains why RCP 1B2 did not experience seal failure in the previous cycle (cycle 23) when heat checking on its upper rotating seal ring is believed to have occurred.

.4 Determine if the licensee's corrective actions are reflective of the root cause determination and will reasonably prevent recurrence. Repairs should be assessed to determine if they are comprehensive with respect to the affected components. (Note: In light of the amount of observed seal debris, corrective actions should also address the possible entry of such foreign material into the reactor coolant system.) (Charter Item 4)

a. Inspection Scope

The inspectors reviewed the following items to evaluate the licensee's action to prevent recurrence of RCP seal failures during cooldown and depressurization conditions:

- All corrective actions assigned in PIP O-08-1940
- The licensee's self-assessment of operator actions associated with the RCP seal failures
- Modification packages for changes to the RCP seal system/package
- Changes to plant procedures associated with RCP normal, abnormal, and emergency operations

b. Findings

No findings of significance were identified.

During recovery from the seal failures the licensee took appropriate action to ensure reactor coolant system cleanliness. The licensee's short-term (prior to reactor startup following the refueling outage) corrective actions associated with PIP O-08-1940 were considered adequate to prevent recurrence of the seal failures due to heat checking damage during the operating cycle. The principle actions taken were:

- Increasing seal staging flow from 1.5 gpm to 2.2 gpm
- Installing standpipes on seal leak-off lines from the upper stage seal on all four RCPs
- Installing additional temperature sensors on the seal return flow piping
- Increasing the ranges and sensitivity of the seal return flow sensors
- Returning the shaft sleeve adjusting nut tightness to the original manufacturers specifications
- Changing operating, abnormal, and emergency procedures to provide closer monitoring and more conservative actions if heat checking or high vibration are encountered
- As a backup to RCP 1A1, RCP 1A2 was also balanced to reduce vibration at low pressure

.5 Determine whether the circumstances surrounding this event, including seal performance, have any generic implications. For any identified generic safety issues, make recommendations for appropriate follow-up actions (e.g., Information Notices, Generic Letters, Bulletins, etc.). (Charter Item 5)

a. Inspection Scope

The team reviewed the licensee's internal operating experience database, root cause evaluation, selected PIPs, and the NRC operating experience database to assess the licensee's actions to address related operating experience items.

b. Findings and Observations

No findings of significance were identified.

The licensee's root cause evaluation determined that the most probable cause of the RCP seal failures was inadequate design. The licensee's operating experience review indicated that the inadequate design aspects were unique to the Oconee Unit 1 seal failures because Oconee Unit 1 is the only site that uses the three stage Sulzer seal design in a Westinghouse pump. Thus, there was no operating experience history associated with this exact application. Prior to the 1A2 and 1B2 RCP seal failures, there was a lack of procedural guidance to restrict operation of a RCP with a single seal stage failed. The licensee indicated that as a result of the failure mechanism identified for the middle and lower seal stages, operating experience was being shared with the industry regarding a need to review the procedural guidance which allowed continued RCP operation with a failed seal stage. Accordingly, the licensee revised AP/1/A/1700/016 to secure a RCP with a failed seal stage, as quickly as plant conditions allow, in order to maintain the integrity of the remaining seal stages.

.6 Working with a Senior Reactor Analyst, gather necessary information to evaluate the risk significance of any performance deficiencies identified during the inspection. (Charter Item 6)

a. Inspection Scope

The team reviewed plant data, plant procedures, PIPs, work orders, root cause evaluations, operational assessments, engineering evaluations, and operating experience information to gather data necessary to develop and assess the safety significance of any identified findings.

b. Findings and Observations

The findings identified during this inspection and their disposition are discussed in Sections 4OA5.2b.(1) - (4) of this inspection report.

4OA6 Meetings, Including Exit

On June 4, 2008, the special inspection team leader presented the preliminary inspection results to Mr. Dave Baxter, Oconee Nuclear Station Site Vice President, and members of his staff. Subsequently, additional in-office reviews were conducted and the final inspection results were discussed by telephone with Mr. Baxter and members of his staff on July 2, 2008. The licensee acknowledged the inspection findings. Proprietary information was reviewed during the inspection but none is included in this inspection report.

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel
K. Alter, Balance of Plant Engineering Supervisor
E. Anderson, Superintendent of Operations
S. Batson, Engineering Manager
D. Baxter, Site Vice President
C. Compton, Reactor Coolant Pump System Engineer
D. Coyle, Operations Support Manager
C. Curry, Mechanical/Civil Engineering (MCE) Manager
G. Davenport, Regulatory Compliance Manager
B. Duncan, Maintenance Supervisor
R. Freudenberger, Safety Assurance Manager
M. Glover, Station Manager
C. Hamlin, Supervisor, Mechanical Rotating Equipment, MCE
L. Hancox, Nuclear Shift Supervisor, Operations Human Performance
J. Patterson, Operations Support Engineer
J. Smith, Technical Specialist, Regulatory Compliance
M. Stephens, Nuclear Shift Operations Manager
J. Weast, Regulatory Compliance Engineer

NRC Personnel
C. Casto, Acting Deputy Regional Administrator Operations, Region II
A. Hutto, Senior Resident Inspector
E. Riggs, Resident Inspector
S. Rose, Acting Chief, Branch 1, Division of Reactor Projects, Region II

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

None.

Opened and Closed

05000269/2008008-01	NCV	Failure to Comply with Procedure OMP 1-18 by Overriding Abnormal Procedure Requirements Beyond the Point of Placing the Plant in a Safe/Stable Condition (Section 4OA5.2b.(1))
05000269/2008008-02	NCV	Failure to Enter AP/1/A/1700/026 for a Loss of RCS Inventory from a Seal Leak Which Developed on the 1A2 RCP (Section 4OA5.2b.(2))
05000269/2008008-03	NCV	Failure to Fully Comply With Procedure SOMP 04-02 and Fully Implement or Formally Change the Requirements of AP/1/A/1700/016 (Section 4OA5.2b.(3))

05000269/2008008-04	NCV	Failure to Comply with Procedure OMP 2-01 When Monitoring Plant Parameters (Section 4OA5.2b.(4))

Discussed

None.

Documents Reviewed

Procedures

AP/1/A/1700/016, Abnormal Reactor Coolant Pump Operations
AP/1/A/1700/018, Abnormal Release of Radioactivity
AP/1/A/1700/026, Loss of Decay Heat Removal
OMP 1-18, Implementation Standard During Abnormal And Emergency Events
OMP 2-01, Duties and Responsibilities Of On-Shift Operations Personnel
SOMP 04-02, Procedure Use and Adherence
OP/0/A/1108/001, Curves and General Information
OP/1/A/1102/010, Controlling Procedure for Unit Shutdown
OP/1/A/1103/006, RCP Operation
MP/0/A1400/002, Equipment Hatch and Shield Doors - Reactor Building - Initial Opening and Final Closing
MP/1/A/1310/052, RCP Seal, Unit 1, Bingham Type RCRW 950B-3, Static Fitness Test, Rev. 04
NSD 703, Administrative Instructions for Technical Procedures
RPSM 5.4, Equipment Hatch and Construction Opening Surveillance and Control

Miscellaneous Documents

EM 4.11, 1A2 RCP Spool Piece Vibration in Hi-Hi Alarm, 04/12/2008
EM 4.11, 1B2 RCP Spool Piece Vibration Temporary Hi-Hi Alarm Limit, 04/12/2008
EM 4.11, Contingency Plan for Heat-Checked RCP(s) on Unit 1, 05/21/2008
Root Cause Failure Analysis Report, Unit 1 RCP Seal Failure, Rev. 0, PIP O-08-1940, 06/19/2008
Evaluation of RCP Seal Failure Given Loss of Seal Cooling for Oconee Units 1, 2 and 3, July 2001
Unit 1 RCP Seal Cause Investigation, 11/29/2005
OSC-7658, Design Inputs for Replacing Westinghouse RCP Mechanical Seals, Rev. 000
Results of Failure Analysis of SCE Coolant Pump tungsten Carbide Mechanical Seals 16,19, and a Support Ring and Evaluation of Corrosion on Cartridge Sleeve 23 – GAISC w/o 2966327 400, 02/27/1992
Doc. No. 01711969, Operations – Maintenance Instructions and Parts List for RCRW 950B Mechanical Seal, Rev.6
OD102245, Modify U1 RCP Seal Staging Coils, 05/22/2008
OD102249, U1 RCP Standpipe & Leakage Cover, 05/14/2008
OD102246, U1 RCP Increase Seal Return Flow, 05/12/2008
OD102247, U1 RCP Add Seal Return & Leak Off Temperature Monitoring, 05/09/2008
OD102258, U1 RCP OAC Indication of Injection Flow, 05/15/2008
OD102264, U1 RCP Weld Seal Screen Sketches, 05/10/2008
OD102265, U1 RCP Revise Sulzer RCP Manual, 05/13/2008

Problem Identification Process Reports (PIPs)

O-03-1861, O-03-6716, O-03-8104, O-03-8282, O-04-0561, O-04-3469, O-04-7681, O-04-9149, O-05-5362, O-06-8980, O-07-0843, O-07-4530, O-08-1094, O-08-1926, O-08-1940, O-08-1941, O-08-1947, O-08-2403, O-08-2558, O-08-2567, O-08-2573, O-08-2935, O-08-3096, O-08-3154, O-08-3170, O-08-3173

PIPs Generated During the Inspection

O-08-3206, O-08-3572

Drawings

OM 201.D-0062 001, Manual Cross Section RCRW 950B-3 Sectional Drawing, Rev. DI
OM 201.D-0062 002, Parts List for Drawing D33732 Pump Conversion Parts Sulzer Pumps – CSS Engineering RCRW 950B-3 Seal, Rev. D9
OM 201.D-0062 003, Parts List for Drawing D33732 Pump conversion Parts Sulzer Pumps – CSS Engineering RCRW 950B-3 Seal, Rev. D9
OM 201.D-0062 004, Parts List for Drawing D33732 RCP Seal Cartridge Assembly Sulzer Pumps – CSS Engineering RCRW 950B-3 Seal, Rev. D4
OFD-100A1.3, Flow Diagram of Reactor Coolant System (Reactor Coolant Pumps Seal Injection), Rev. 11
OFD-101A1.1, Flow Diagram of High Pressure Injection System (Letdown Section), Rev. 42
OFD-101A1.2, Flow Diagram of High Pressure Injection System (Storage Section), Rev. 38
OFD-101A1.3, Flow Diagram of High Pressure Injection System (Charging Section), Rev. 42
OFD-101A1.4, Flow Diagram of High Pressure Injection System (Charging Section), Rev. 37

LIST OF ACRONYMS

ARG	Alarm Response Guide
DHR	Decay Heat Removal
EOC	End-of-Cycle
gpm	Gallons Per Minute
IMC	Inspection Manual Chapter
LPI	Low Pressure Injection
NCV	Non-Cited Violation
NRC	U.S. Nuclear Regulatory Commission
OCC	Outage Control Center
ONS	Oconee Nuclear Station
OpE	NRC Operating Experience Database
OSM	Operations Shift Manager
PIP	Problem Investigation Process
PORC	Plant Operations Review Committee
PRA	Probabilistic Risk Assessment
RB	Reactor Building
RBNS	Reactor Building Normal Sump
RCP	Reactor Coolant Pump
RCS	Reactor Coolant System
RFO	Refueling Outage
SDP	Significance Determination Process
TS	Technical Specifications

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

April 25, 2008

MEMORANDUM TO: McKenzie Thomas, Lead Inspector
Special Inspection

FROM: Victor M. McCree
Acting Regional Administrator

SUBJECT: SPECIAL INSPECTION CHARTER TO EVALUATE OCONEE UNIT 1 REACTOR COOLANT PUMPS (RCPs) ABNORMAL HIGH VIBRATIONS AND SEAL DEGRADATION EXPERIENCED DURING PLANT SHUTDOWN ON APRIL 12, 2008

You have been selected to lead a Special Inspection to assess the circumstances surrounding the Oconee Unit 1 plant shutdown on April 12, 2008, in preparation for the end-of-cycle 24 refueling outage. Specifically, while performing plant cooldown/depressurization activities in support of the outage, the plant experienced high vibration on all three of the operating RCPs (i.e., 1B2, 1B1, and 1A2), as well as experienced an approximate 5 gpm leak from the 1A2 RCP seal package and other indications of degraded stages on the 1B2 RCP seal package. At the time the 1A2 RCP seal leak occurred, the plant was on decay heat removal. However, the operating RCPs had sequentially exhibited elevated vibration levels starting near rated temperature and pressure, on through the cooldown. The cause of the RCP vibration and leakage is not yet known. Your inspection should begin on or before April 28, 2008. Walt Rogers will provide Senior Reactor Analyst support.

A. Basis

The abnormally high vibration seen on the three operating RCPs during the plant cooldown, and the seal degradation and leakage, have potential common cause aspects that should be further investigated to understand the underlying reasons.

In accordance with Management Directive 8.3, "NRC Incident Investigation Program," both deterministic and conditional risk criteria were used to evaluate the level of NRC response for this condition. In this evaluation, it was concluded that this event met deterministic criteria (1)e, in that, the possibility of adverse generic implications could not be ruled out, as Sulzer seal packages (containing three full pressure seals) are not unique to Oconee. It should be noted that the use of these seal packages in the Unit 1

CONTACT: Joseph Shea, DRP
(404) 562-4600

Westinghouse RCPs is relatively new, and have had a history of issues since the modification was implemented in December 2000. (Note: The 1A2 and 1B1 RCP seal packages were rebuilt in Fall 2006 and the 1B2 RCP seal package was rebuilt in Spring 2005.) The conditional risk assessment was determined to be in a range of calculated conditional risk estimates of 1E-5.

Because of the potential generic aspects, it was determined that a Special Inspection should be conducted prior to Unit 1 restart. The Special Inspection should include an assessment of the licensee's root cause determination (for both the RCP vibration and seal degradation/failure), related operational aspects, and associated corrective actions. This assessment should also consider any past evaluations performed by the licensee which addressed similar RCP issues (e.g., vibrations, seal package degradation, etc.).

B. Scope

The inspection is expected to perform data gathering and fact-finding in order to address the following:

(1) Develop a complete description of the RCP high vibration and subsequent seal degradation/failure. This should include a sequence of events timeline, identifying operations and management decision points, from when the high RCP vibration and seal degradation was first identified until the last RCP was no longer needed and secured.

(2) Determine if operational decision making was appropriate in terms of operating pump combinations during shutdown, continuing to operate the 1A2 RCP with high vibrations, and to restart the 1B2 RCP.

(3) Evaluate the adequacy of the licensee's root cause. Determine if the licensee understands the seal failure mechanism and RCP vibration phenomenon prior to restart, as well as what impact (if any) the extended operation and/or subsequent cooldown of the plant without the 1A1 RCP may have had. This effort should include a review of any operational anomalies in the past cycle(s) that could be a potential precursor.

(4) Determine if the licensee's corrective actions are reflective of the root cause determination and will reasonably prevent recurrence. Repairs should be assessed to determine if they are comprehensive with respect to the affected components. (Note: In light of the amount of observed seal debris, corrective actions should also address the possible entry of such foreign material into the reactor coolant system.)

(5) Determine whether the circumstances surrounding this event, including seal performance, have any generic implications. For any identified generic safety issues, make recommendations for appropriate follow-up actions (e.g., Information Notices, Generic Letters, Bulletins, etc.).

(6) Working with a Senior Reactor Analyst, gather necessary information to evaluate the risk significance of any performance deficiencies identified during the inspection.

C. Guidance

Inspection Procedure 93812, "Special Inspection," provides guidance to be used during the conduct of the Special Inspection. Safety or security concerns identified that are not directly related to the event should be reported to the Region II office for appropriate action.

You will report to the site, conduct an entrance, and begin inspection no later than April 28, 2008. It is anticipated that the on-site portion of the inspection will be completed during the week of April 28, 2008. A daily status briefing of Region II management will be provided, beginning with the first day on-site, at 3:00 p.m., (EDT). A report documenting the results of the inspection shall be issued within 30 days of the completion of the inspection.

This Charter may be modified should you develop significant new information that warrants review. Please contact Kathy D. Weaver at (404) 562-4647 if you have any questions regarding this inspection.

References:
1. NRC Inspection Procedure 93812, "Special Inspection"
2. Region II ROI 2296, "Management Directive 8.3 Decision Documentation Form"
3. Management Directive 8.3, "NRC Incident Investigation Program"
4. Manual Chapter 0612, "Power Reactor Inspection Reports"
5. Manual Chapter 0609, "Significance Determination Process"

Docket No.: 50-269
License No.: DPR-38

cc: B. Mallett, OEDO
M. Cox, OEDO
M. Ross-Lee, NRR
C. Wong, NRR
L. Olshan, NRR
J. Shea, RII
C. Casto, RII
V. McCree, RII
K. Kennedy, RII

future inspections will include examination of these aspects. We recognize that the plant conditions at the time of the incident (reactor shutdown and reactor coolant system at reduced pressure) significantly limited the potential public health and safety implications.

This report documents four NRC-identified findings of very low safety significance (Green), which were determined to involve violations of NRC requirements. However, because of their very low safety significance and because they were entered into your corrective action program, the NRC is treating these findings as non-cited violations (NCVs), consistent with Section VI.A.1 of the NRC Enforcement Policy. If you contest any NCV in this report, 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, D.C. 20555-0001; with copies to the Regional Administrator, Region II; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, D.C. 20555-0001; and the NRC Resident Inspector at the Oconee station.

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 NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electric Reading Room).

Sincerely,

Leonard D. Wert, Director
Division of Reactor Projects

Docket No.: 50-269
License No.: DPR-38

Enclosure: NRC Special Inspection Report 05000269/2008008
w/Attachments: 1. Supplemental Information
2. Special Inspection Team Charter

cc w/encl.: (See page 2)

(*) – SEE PREVIOUS PAGE FOR CONCURRENCES

☐ PUBLICLY AVAILABLE ☐ NON-PUBLICLY AVAILABLE ☐ SENSITIVE ☐NON-SENSITIVE

ADAMS: ☐ Yes ACCESSION NUMBER:_____ ☑ SUNSI REVIEW COMPLETE MT 7/31/2008

OFFICE	RII:DRS	RII:DRS	RII:DRS	RII:DRP	RII:DRS	RII:DRP	RII:DRP
SIGNATURE	RA *	RA *	RA *	RA *			
NAME	MThomas	GGardner	CKontz	SRose	KKennedy	LWert	
DATE	7/ /2008	7/ /2008	7/ /2008	7/ /2008	7/ /2008	7/ /2008	7/ /2008
E-MAIL COPY?	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES

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(reactor shutdown and reactor coolant system at reduced pressure) significantly limited the potential public health and safety implications. Our reviews of your corrective actions during future inspections will include examination of these aspects.

This report documents four NRC-identified findings of very low safety significance (Green), which were determined to involve violations of NRC requirements. However, because of their very low safety significance and because they were entered into your corrective action program, the NRC is treating these findings as non-cited violations (NCVs), consistent with Section VI.A.1 of the NRC Enforcement Policy. If you contest any NCV in this report, 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, D.C. 20555-0001; with copies to the Regional Administrator, Region II; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, D.C. 20555-0001; and the NRC Resident Inspector at the Oconee station.

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NAME	MThomas	GGardner	CKontz	SRose	KKennedy	LWert	
DATE	7/ /2008	7/ /2008	7/ /2008	7/ /2008	7/31 /2008	7/ /2008	7/ /2008
E-MAIL COPY?	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES N

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Additionally, we noted that the use of guidance that permits actions to be taken outside of those set forth in prescribed procedures contributed to some of the performance issues. Our reviews of your corrective actions during future inspections will include examination of these aspects.

This report documents four NRC-identified findings of very low safety significance (Green), which were determined to involve violations of NRC requirements. However, because of their very low safety significance and because they were entered into your corrective action program, the NRC is treating these findings as non-cited violations (NCVs), consistent with Section VI.A.1 of the NRC Enforcement Policy. If you contest any NCV in this report, 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, D.C. 20555-0001; with copies to the Regional Administrator, Region II; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, D.C. 20555-0001; and the NRC Resident Inspector at the Oconee station.

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Leonard D. Wert, Director
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E-MAIL COPY?	YES NO	YES NO	YES NO	~~YES~~ NO	YES NO	YES NO	YES

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McKenzie Thomas

From: Craig Kontz
Sent: Wednesday, July 30, 2008 1:03 PM
To: McKenzie Thomas
Subject: RE: Oconee SIT 2008008

I have read the report and have no additional comments.

Please consider this e-mail as my concurrence on the report

Thank You

Craig

From: McKenzie Thomas
Sent: Wednesday, July 30, 2008 8:12 AM
To: Craig Kontz
Subject: Oconee SIT 2008008

Craig,
Attached is the Final Draft of the Oconee SIT report 05000269/2008008. Please review today and provide comments and your concurrence as soon as you get a chance. You can either concur by email or sign the concurrence page and **Fax it to (404) 562-4979.** Call me if you have questions. Thanks.

McKenzie Thomas
USNRC Region II
404-562-4673