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February 10, 2009

U.S. Nuclear Regulatory Commission
Document Control Desk
Washington, D.C. 20555

Subject: Oconee Nuclear Station
Docket No. 50-287
Licensee Event Report 287/2009-01, Revision 0
Problem Investigation Process No.: O-08-8339

Gentlemen:

Pursuant to 10 CFR 50.73 Sections (a)(1) and (d), attached is Licensee Event Report 287/2009-01, Revision 0, regarding inoperability of two containment isolation valves in the Post-Accident Liquid Sampling System. This report is being submitted in accordance with 10 CFR 50.73 (a)(2)(i)(B).

This event is considered to be of no significance with respect to the health and safety of the public.

There are no regulatory commitments contained in this report.

Any questions regarding the content of this report should be directed to Russ Oakley at 864-885-3829.

Very truly yours,

Dave Baxter, Vice President
Oconee Nuclear Site

Attachment

IE22
NRR

cc: Mr. Luis Reyes
Administrator, Region II
U.S. Nuclear Regulatory Commission
61 Forsyth Street, S. W., Suite 23T85
Atlanta, GA 30303

Mr. John Stang
Project Manager
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Mr. Andy Hutto
NRC Senior Resident Inspector
Oconee Nuclear Station

INPO (Word File via E-mail)

NRC FORM 366 (9-2007) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB: NO. 3150-0104 EXPIRES: 08/31/2010

Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Records and FOIA/Privacy Service Branch (T-5 F52), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to infocollects@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

# LICENSEE EVENT REPORT (LER)

(See reverse for required number of digits/characters for each block)

| 1. FACILITY NAME | 2. DOCKET NUMBER | 3. PAGE |
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| Oconee Nuclear Station, Unit 3 | 05000 287 | 1 OF 4 |

**4. TITLE**
Two PALS CIVs Inoperable Due to Use of Unqualified Seat Material

| 5. EVENT DATE | | | 6. LER NUMBER | | | 7. REPORT DATE | | | 8. OTHER FACILITIES INVOLVED | |
|---|---|---|---|---|---|---|---|---|---|---|
| MONTH | DAY | YEAR | YEAR | SEQUENTIAL NUMBER | REV NO. | MONTH | DAY | YEAR | FACILITY NAME | DOCKET NUMBER |
| | | | | | | | | | None | 05000 |
| 12 | 12 | 2008 | 2009 | - 01 - | 0 | 02 | 10 | 2009 | FACILITY NAME None | DOCKET NUMBER 05000 |

**9. OPERATING MODE**: 1

**10. POWER LEVEL**: 100%

**11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR§:** *(Check all that apply)*

| | | | |
|---|---|---|---|
| ☐ 20.2201(b) | ☐ 20.2203(a)(3)(i) | ☐ 50.73(a)(2)(i)(C) | ☐ 50.73(a)(2)(vii) |
| ☐ 20.2201(d) | ☐ 20.2203(a)(3)(ii) | ☐ 50.73(a)(2)(ii)(A) | ☐ 50.73(a)(2)(viii)(A) |
| ☐ 20.2203(a)(1) | ☐ 20.2203(a)(4) | ☐ 50.73(a)(2)(ii)(B) | ☐ 50.73(a)(2)(viii)(B) |
| ☐ 20.2203(a)(2)(i) | ☐ 50.36(c)(1)(i)(A) | ☐ 50.73(a)(2)(iii) | ☐ 50.73(a)(2)(ix)(A) |
| ☐ 20.2203(a)(2)(ii) | ☐ 50.36(c)(1)(ii)(A) | ☐ 50.73(a)(2)(iv)(A) | ☐ 50.73(a)(2)(x) |
| ☐ 20.2203(a)(2)(iii) | ☐ 50.36(c)(2) | ☐ 50.73(a)(2)(v)(A) | ☐ 73.71(a)(4) |
| ☐ 20.2203(a)(2)(iv) | ☐ 50.46(a)(3)(ii) | ☐ 50.73(a)(2)(v)(B) | ☐ 73.71(a)(5) |
| ☐ 20.2203(a)(2)(v) | ☐ 50.73(a)(2)(i)(A) | ☐ 50.73(a)(2)(v)(C) | ☐ OTHER |
| ☐ 20.2203(a)(2)(vi) | ☒ 50.73(a)(2)(i)(B) | ☐ 50.73(a)(2)(v)(D) | Specify in Abstract below or in NRC Form 366A |

**12. LICENSEE CONTACT FOR THIS LER**

| NAME | TELEPHONE NUMBER (Include Area Code) |
|---|---|
| R. L. Oakley, Senior Licensing Engineer | (864) 885-3829 |

**13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT**

| CAUSE | SYSTEM | COMPONENT | MANU-FACTURER | REPORTABLE TO EPIX | CAUSE | SYSTEM | COMPONENT | MANU-FACTURER | REPORTABLE TO EPIX |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |

| 14. SUPPLEMENTAL REPORT EXPECTED | | 15. EXPECTED SUBMISSION DATE | MONTH | DAY | YEAR |
|---|---|---|---|---|---|
| ☐ YES *(If yes, complete 15. EXPECTED SUBMISSION DATE)* | ☒ NO | | | | |


ABSTRACT *(Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)*

On December 12, 2008 two containment isolation valves in a Post Accident Liquid Sampling line in Unit 3 were declared inoperable. Technical Specification Limiting Condition for Operation (LCO) 3.6.3 Conditions A and B were entered immediately and power was removed from two normally-closed solenoid-operated valves in the same line to meet the required actions of the LCO. However, the unit has been operated since the valves were installed in 1996 until discovery of the inoperable condition. Consequently, the appropriate Technical Specification required actions were not met within the allowed outage time permitted, and the unit was operated in a condition prohibited by Technical Specifications.

The inoperable condition was caused by the use of soft seat materials which are not qualified for the elevated pressure and temperatures they could be exposed to in post-accident sampling service. The planned corrective action is to replace the soft-seated valves with a hard-seated design.

This event is considered to have no significance with respect to the health and safety of the public.

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17. NARRATIVE *(If more space is required, use additional copies of NRC Form 366A)*

EVALUATION:

BACKGROUND

The Post-Accident Liquid Sampling System (PALS) [KN] contains a line which runs from the Reactor Coolant System (RCS)[AB], through a containment penetration, to the sampling panel in the Auxiliary Building. The line contains two normally-closed solenoid-operated valves [SMV] inside containment (3RC-162 and 3RC-163) and two normally-closed manual valves (3RC-164 and 3RC-165) [ISV] outside containment. The two manual valves outside containment are credited as containment isolation valves (CIVs). This line is used to obtain boron samples following certain design basis events.

This event is reportable per 10CFR 50.73(a)(2)(i)(B) because Unit 3 was operated in a condition prohibited by Technical Specifications (TS) for a period of time prior to recognition of the condition.

Prior to this event Unit 3 was operating at 100% power. Other safety systems and/or components were out of service at various times during the period of CIV inoperability. However, no plant evolutions or other inoperable equipment contributed to this event.

EVENT DESCRIPTION

On December 12, 2008, Oconee Nuclear Station (Oconee) discovered a design deficiency with containment isolation valves 3RC-164 and 3RC-165. The deficiency was discovered by Duke personnel during reviews of the preventive maintenance activities for these valves. The valves were declared inoperable, and operators entered TS 3.6.3 Conditions A and B at 2000 hrs. These conditions require that the containment penetration be isolated within one hour by use of at least one closed and de-activated automatic valve, one closed and de-activated non-automatic power operated valve, closed manual valve, or blind flange. TS required actions were satisfied by de-activating (removing power from) two normally-closed solenoid-operated valves (3RC-162 and 3RC-163) in the same sampling line at 2057 hrs.

Unit 3 has been operated at 100% power for several fuel cycles between installation of 3RC-164 and 3RC-165 in 1996 until the time

of discovery in 2008. Therefore, the unit was in the mode of applicability for LCO 3.6.3 upon entry into Mode 4 on startup from each refueling outage and TS 3.6.3 Conditions A and B were applicable during the entirety of each operating cycle. Also, Condition D was applicable one hour after Condition B, since the required actions of Conditions A and B were not completed. Condition D requires shutdown to Mode 3 within 12 hours and shutdown to Mode 5 within 36 hours. Since operators were unaware of the condition until years after the TS conditions became applicable, the required actions for these conditions were not taken within the required completion times prescribed by TS.

CAUSAL FACTORS

The cause of the inoperability and subsequent reportable condition was a design deficiency involving the use of soft seat materials in containment isolation valves 3RC-164 and 3RC-165. These seats were made of a polymeric material which was not rated for pressure and temperature conditions to which it might have been exposed during post-accident sampling service. Therefore, the valve seats might have been damaged by exposure to these fluid conditions during sampling activities, causing the valves to be subsequently incapable of performing their containment isolation function.

A contributing causal factor was the human error of selecting materials for use in an application for which they were not qualified. However, since this application error was made more than three years ago, it is considered a historical error.

CORRECTIVE ACTIONS

Immediate:

1) Upon discovery of the condition, 3RC-164 and 3RC-165 were declared inoperable. TS 3.6.3 Conditions A and B were entered, and power was removed from (normally-closed) valves 3RC-162 and 3RC-163.

Subsequent:

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17. NARRATIVE *(If more space is required, use additional copies of NRC Form 366A)*

1) Confirmed that the condition did not exist on equivalent valves installed in the Unit 1 and 2 PALS system. These valves (1&2RC-164&165) are hard-seated designs which are not susceptible to the same failure modes as the soft-seated design.

Planned:

1) Oconee plans to replace 3RC-164 and 3RC-165 with metal-seated valves.

SAFETY ANALYSIS

This event did not include a loss of safety system function. Since 3RC-162 and 3RC-163 have hard seat materials which would not be degraded by exposure to high temperature and pressure conditions associated with sampling activity, these valves would have been capable of performing the containment isolation safety function. These are normally-closed valves which are re-closed by procedure following post-accident sampling evolutions. Since there was no loss of safety function, there was no impact on core damage frequency.

No fission product barriers were compromised by this event. Therefore, there was no actual impact on the health and safety of the public due to this event.

ADDITIONAL INFORMATION

A search of Oconee's corrective action database found no similar occurrences of this type of event with same cause.

There were no releases of radioactive materials, radiation exposures or personnel injuries associated with this event.

Energy Industry Identification System (EIIS) codes are identified in the text within brackets []. This event is not considered reportable under the Equipment Performance and Information Exchange (EPIX) program.