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

Subject: Oconee Nuclear Station  
Docket Nos. 50-269, -270, -287  
Licensee Event Report 270/2008-02, Revision 1  
Problem Investigation Process No.: O-08-6525,  
O-08-7831, O-06-6400, O-07-2168, O-07-5911

Gentlemen:

Pursuant to 10 CFR 50.73 Sections (a)(1) and (d), attached is Licensee Event Report 270/2008-02, Revision 1, regarding operation with several Main Steam Relief Valves slightly out of tolerance. The report also addresses three prior events which were similar, but not previously recognized as reportable.

This report is being submitted in accordance with 10 CFR 50.73(a)(2)(i)(B) "Any operation or condition prohibited by the plant's Technical Specifications."

Revision 1 corrects a misstatement of fact in the safety analysis section. Revision 0 stated that only one valve exceeded the 2% criterion used in Duke Energy's safety analysis calculations. In fact, two valves exceeded this criterion, as indicated by as-found data provided in Revision 0. It is noted that the two valves were on different Oconee Units. Therefore, the error does not change our conclusion that this event is considered to be of no significance with respect to the health and safety of the public.

Revision 1 also corrects an unrelated typographical error in a date in the Abstract, standardizes acronyms, and updates the conclusions of the cause investigation.

FE22  
NRR

Document Control Desk

Date: October 1, 2009

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There are no regulatory commitments contained in this report.

Any questions regarding the content of this report should be directed to R.P. Todd at 864-873-3418.

Very truly yours,



*for* Dave Baxter, Vice President  
Oconee Nuclear Site

Attachment

cc: Mr. Luis Reyes  
Administrator, Region II  
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INPO (Word File via E-mail)

**LICENSEE EVENT REPORT (LER)**

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

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**4. TITLE**  
Main Steam Relief Valves Exceeded Lift Setpoint Acceptance Band

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MO	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO	MO	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
10	24	2008	08	- 02	- 01	10	1	2009	Unit 1	05000 269
									Unit 3	05000 287

<b>9. OPERATING MODE</b> 1	<b>11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §:</b> (Check all that apply)										
	<input type="checkbox"/> 20.2201(b)	<input type="checkbox"/> 20.2203(a)(3)(i)	<input type="checkbox"/> 50.73(a)(2)(i)(C)	<input type="checkbox"/> 50.73(a)(2)(vii)							
<b>10. POWER LEVEL</b>  100	<input type="checkbox"/> 20.2201(d)	<input type="checkbox"/> 20.2203(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)							
	<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 20.2203(a)(4)	<input type="checkbox"/> 50.73(a)(2)(ii)(B)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)							
	<input type="checkbox"/> 20.2203(a)(2)(i)	<input type="checkbox"/> 50.36(c)(1)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(ix)(A)							
	<input type="checkbox"/> 20.2203(a)(2)(ii)	<input type="checkbox"/> 50.36(c)(1)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(iv)(A)	<input type="checkbox"/> 50.73(a)(2)(x)							
	<input type="checkbox"/> 20.2203(a)(2)(iii)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(v)(A)	<input type="checkbox"/> 73.71(a)(4)							
	<input type="checkbox"/> 20.2203(a)(2)(iv)	<input type="checkbox"/> 50.46(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(v)(B)	<input type="checkbox"/> 73.71(a)(5)							
	<input type="checkbox"/> 20.2203(a)(2)(v)	<input type="checkbox"/> 50.73(a)(2)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(C)	<input type="checkbox"/> OTHER							
	<input type="checkbox"/> 20.2203(a)(2)(vi)	<input checked="" type="checkbox"/> 50.73(a)(2)(i)(B)	<input type="checkbox"/> 50.73(a)(2)(v)(D)	Specify in Abstract below or in NRC Form 366A							

**12. LICENSEE CONTACT FOR THIS LER**

NAME R. P. Todd	TELEPHONE NUMBER (Include Area Code) (864) 873-3418
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**13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT**

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX
X	SB	RV	C710	N					

<b>14. SUPPLEMENTAL REPORT EXPECTED</b>				<b>15. EXPECTED SUBMISSION DATE</b>		
YES (If yes, complete EXPECTED SUBMISSION DATE)	X	NO		MONTH	DAY	YEAR

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

When tested on 10/24/2008, while in Mode 1 prior to shutdown for refueling, as-found lift pressure tests of Oconee Unit 2 main steam relief valves (MSRVs) revealed 3 unsatisfactory MSRVs out of a total of 16. Technical Specification (TS) 3.7.1 requires 16 MSRVs (8 on each header) to be operable in modes 1, 2 and 3 so Condition A was entered. The affected MSRVs were adjusted, satisfactorily retested, and the condition exited. Since multiple failures indicate the condition may have arisen over time, there is a likelihood that all of the required MSRVs were not operable during past plant operation. Therefore, this occurrence is considered reportable in accordance with 10 CFR 50.73(a)(2)(i)(B) as a condition prohibited by TS.

A review of prior similar events found three additional occurrences which were not previously recognized as reportable and are addressed in this report (Unit 1, 2 MSRVs, 2006; Unit 2, 2 MSRVs, 2007; and Unit 3, 2 MSRVs, 2007).

The cause of these occurrences has been identified as setpoint drift. All of the unsatisfactory as-found lift pressures were above the acceptance band but within analysis limits so there was no loss of function. This event is considered to have no significance with respect to the health and safety of the public.

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EVALUATION:

BACKGROUND

This event is reportable per 10CFR 50.73(a)(2)(i)(B) "Any operation or condition prohibited by the plant's Technical Specifications."

The Updated Final Safety Analysis Report (UFSAR), Section 10.3, describes that each Oconee unit has two main steam [EIIS:SB] lines, and pressure relief is provided by eight Main Steam Relief Valves (MSRVs) [EIIS:RV] on each main steam line (sixteen valves total per unit). The nominal relief setpoint values vary from 1050 psig up to 1104 psig, as allowed by the American Society of Mechanical Engineers (ASME) Code, such that the valves are divided into banks with six discrete setpoints. The UFSAR includes a table which specifies the nominal relief setpoint and the range of allowed values (i.e. Owner established acceptance criteria) for each bank and the number of valves per line in that bank. The allowed ranges represent a -3 to +1 percent tolerance from the nominal setpoint, which is tighter than the -3 to +3 percent tolerance allowed by the ASME OMa Code. Although the OMa Code only requires testing of a percentage of the MSRVs each refueling outage, the normal practice at Oconee is to test all 16 of the MSRVs each outage. The Maintenance procedure in place at the time of the event controlled the allowed "As Left" tolerance to +/- 1 percent (see planned corrective action 3). The Oconee accident analyses assume an upper tolerance of +2 percent.

Technical Specification (TS) 3.7.1 is applicable in Modes 1, 2 and 3. TS 3.7.1 Condition A requires entry into Mode 3 within 12 hours and into Mode 4 within 18 hours if one or more MSRVs is inoperable. Surveillance Requirement (SR) 3.7.1.1 requires "Verify each MSRV lift setpoint in accordance with the Inservice Test Program." The Inservice Test Program references the ASME OMa Code. The TS 3.7.1 bases states: "To be OPERABLE, lift setpoints must remain within limits, specified in the UFSAR." Reference 1 of the bases refers to Section 10.3 of the Oconee UFSAR.

Prior to this event Unit 2 was operating in Mode 1 at 100% power with no safety systems or components out of service that would have contributed to this event.

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EVENT DESCRIPTION

Event 1: (PIP O-08-6525)

On 10/24/2008, Oconee Unit 2 was preparing to shutdown for a scheduled refueling outage (2EOC-23). As part of the planned activities, Maintenance personnel performed MSR/V testing prior to shutdown. Per normal practice at Oconee, all 16 of the MSR/Vs were tested. Thirteen MSR/Vs were found within tolerance but three were not.

Specifically, valves 2MS-1, 2MS-9, and 2MS-11 as-found set pressure was outside the +1% allowable range. The control room Senior Reactor Operator (SRO) was notified, the valves were declared inoperable, and TS 3.7.1 Condition A entered. The affected valves were adjusted, retested, and declared operable in a timely manner as indicated below.

The following are the specifics for each valve found out of tolerance:

Valve	Limit	As-found	Time Found	Time Restored
2MS-1	1115	1116	10:30	11:07
2MS-9	1115	1117	10:36	11:49
2MS-11	1091	1094	14:17	14:50

A Problem Investigation Process (PIP) report (O-08-6525) was initiated to document the condition as part of the Duke Energy (Duke) corrective action process. As part of the PIP, this event was evaluated for reportability.

NUREG 1022, Rev 2, Section 3.2.2, provides guidance that "it should be assumed that the discrepancy occurred at the time of its discovery unless there is firm evidence, based on a review of relevant information such as the equipment history and the cause of failure, to indicate that the discrepancy existed previously." Example 3 in that section states "the existence of similar discrepancies in multiple valves is an indication that the discrepancies may well have arisen over a period of time and the failure mode should be evaluated to make this determination."

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Based on this guidance, Duke concluded that the event (failure of the three valves when tested prior to shutdown) is reportable.

A search of the PIP database for similar prior events was conducted.

A number of prior events, going back as far as 1994, involved multiple relief valves found outside the designated tolerance when tested prior to shutdown but were not reported when they occurred. Three of these events occurred within the three year period of 10CFR 50.73(3)(1). After review, Duke has concluded that these three additional events should also be reported so the details are provided below, labeled as events 2, 3 and 4.

Event 2: (PIP O-06-6400)

On 10/06/2006, Oconee Unit 1 was preparing to shutdown for a scheduled refueling outage (1EOC-23). While performing as-found set pressure tests, valves 1MS-8 and 1MS-12 failed their as-found set pressure outside the +1% allowable range. The control room SRO was notified. The affected valves were adjusted, retested, and declared operable in a timely manner as indicated below. The remaining valves were tested and passed their as-found set pressure.

Valve	Limit	As-found	Time Found	Time Restored
1MS-8	1061	1075	10:27	11:28
1MS-12	1101	1104	13:34	13:53

Event 3: (PIP O-07-2168)

On 04/27/2007, Oconee Unit 2 was preparing to shutdown for a scheduled refueling outage (2EOC-22). While performing as-found set pressure tests, valves 2MS-11 and 2MS-14 failed their as-found set pressure outside the +1% allowable range. The control room SRO was notified. The affected valves were adjusted, retested, and declared operable in a timely manner. The remaining valves were tested and passed their as-found set pressure.

Valve	Limit	As-found	Time Found	Time Restored
2MS-11	1091	1104	11:10	11:47
2MS-14	1111	1114	13:53	14:15

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Event 4: (PIP O-07-5911)

On 10/26/2007, Oconee Unit 3 was preparing to shutdown for a scheduled refueling outage (3EOC-23). While performing as-found set pressure test, valves 3MS-3 and 3MS-10 failed their as-found set pressure outside the +1% allowable range. The control room SRO was notified. The affected valves were adjusted, retested, and declared operable in a timely manner. The remaining valves were tested and passed their as-found set pressure.

Valve	Limit	As-found	Time Found	Time Restored
3MS-3	1091	1096	09:48	10:22
3MS-10	1076	1084	13:04	13:35

An additional PIP (O-08-7831) was generated to address the issue of the difference in the evaluations of reportability between the current event and the prior events.

CAUSAL FACTORS

The cause investigation for the four events involving valves failing their as-found set pressure during shutdown testing concluded the technical cause to be set point drift. Investigations to date have considered and rejected causes related to 1) interference binding due to clearances or wear; 2) bonding between disc and nozzle seating surfaces; 3) foreign material; or 4) corrosion. However, the investigation concluded that there was a failure to manage set point margin to minimize the potential for drift to result in a reportable event.

The scope of the event cause investigation was expanded to address the reportability determinations of these and similar prior events.

The cause of the failure to report these events and earlier similar events is failure to properly interpret/apply portions of the TS SR 3.0.1 requirement and a Duke internal directive. Also, reportability determinations placed an over-reliance on evaluations which concluded that the MSRVs were "past operable" prior to discovery.

Prior to January, 1998, Oconee operated under customized Technical Specifications. The TS definition of "operable" was: "A system,

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subsystem, train, component or device shall be considered OPERABLE when it is capable of performing its intended safety function." The applicable TS required the MSRVS to be "operable" but did not specifically address valve setpoints. The TS bases and UFSAR addressed MSRVS operability in terms of the maximum relief capacity of all the valves. A 1994 PIP documents that, although two valves were found with lift setpoints outside the procedure limits, the total relief capacity requirement was met, so that the MSRVS could still perform their intended safety functions. Therefore the PIP concluded that the valves were "past operable" such that no operation prohibited by TS had occurred. Similar evaluations were used in many of the subsequent events.

1998 introduced two significant changes with respect to these issues:

First, the NRC approved NUREG 1022, Revision 1, which included an example on multiple valve failures which provided guidance that discrepancies in multiple valves is an indication that the discrepancies may well have arisen over a period of time, rather than at time of discovery, and therefore the event may be reportable as operation prohibited by Technical Specifications. (Although earlier drafts had included similar guidance, it was not directly included in the section specific to operation prohibited by TS.) A Duke internal directive, NSD 202 "Reportability," was revised in 1998 to incorporate the example.

Second, in 1998 the NRC approved Oconee conversion to "Improved Technical Specifications" (ITS) (actual implementation was March 29, 1999). ITS retained the old definition of Operability (ability to perform the required safety function) but also included SR 3.0.1 which states that "Failure to meet a Surveillance shall be failure to meet the LCO." The ITS conversion relocated the previous setpoint surveillance requirement to SR 3.7.1.1. The acceptable ranges of setpoint values are not included in the TS, but the TS bases refer to the values stated in the UFSAR.

However, the above document changes were not properly reflected in the subsequent reportability evaluations of MSRVS issues. Many of the reportability evaluations documented for the prior unreported events after 1998 did not properly consider the requirement of SR 3.0.1 that "Failure to meet a Surveillance shall be failure to meet

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the LCO." They continued to conclude that the valves were capable of performing their safety function in the as-found condition and were therefore "past operable" for reportability considerations. Several other reportability evaluations simply used the time of discovery. The documentation does not mention consideration of the multiple failure example included in NSD 203. These prior reportability evaluations concluded that the events were not reportable.

The current interpretation of an event involving a MSRV found to operate outside its allowed setpoint values (i.e. unable to meet its surveillance) is that the valve is inoperable, and the LCO not met, even though the remaining valves may enable the Main Steam system to meet its designated safety functions. For a single failed valve, it is acceptable to use the time of discovery to determine the duration of the condition unless a cause gives "firm evidence" that the condition began earlier. If multiple valves cannot meet the surveillance, and the test is being performed during or prior to a shutdown after extended operation, it must be assumed that the failures occurred longer ago than the TS completion time (unless a specific cause justifies otherwise), making the event reportable.

The documented actions associated with these test failures all indicate that the valves were considered "currently inoperable" and appropriate TS conditions entered until adjustments and retesting supported the return to operable status and exit of the TS conditions. Thus the events indicate that the failure to properly interpret and apply SR 3.0.1 is limited to issues related to "past operability" for reportability determinations rather than "current operability."

The cause investigation found that a contributing factor was that many of these determinations were made by a single subject matter expert who had an inappropriate work practice of relying on personal expertise (including the prior evaluations) and did not consult/utilize the directive adequately.

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CORRECTIVE ACTIONS

Immediate:

All valves which had an as-found result outside of the allowed tolerance were promptly adjusted within tolerance and acceptably retested within the completion time allowed by TS 3.7.1.

Subsequent:

None

Planned:

1. Revise NSD 202 "Reportability" to reference the multiple failure example from NUREG 1022 in the same paragraph which discusses the assumption that a discrepancy found during surveillance testing occurred at the time of its discovery.

2. Revise NSD 203 "Operability" to increase emphasis on TS SR 3.0.1 statement that "Failure to meet a Surveillance shall be failure to meet the LCO."

3. The applicable Maintenance Procedure will be revised to lower the as-left range (currently +/- 1%) to provide more margin to the limits of the allowable range (-3/+1%).

4. Generate a training package for appropriate site personnel to address the lessons learned from this event.

None of these corrective actions are considered NRC Commitment items. There are no other NRC Commitment items contained in this LER.

SAFETY ANALYSIS

These events did not include a Safety System Functional Failure. In all cases, the MSRVS remained capable of performing all required safety functions.

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Although the indicated MSRVs failed the owner-established limit of 1%, they were well within the ASME Code allowed +/- 3% tolerance. Only two of the valve failures (one on Unit 1 and one on Unit 2) did not remain within the +2 percent tolerance used by the safety analyses that evaluate peak secondary system pressure. In October of 2006 1MS-8 was found to lift at 1075 psig, or 2.4% above its nominal setpoint. In April of 2007 2MS-11 was found to lift at 1104 psig or 2.2% above its nominal setpoint. The safety analyses that evaluate peak secondary system pressure includes an assumption that one valve (usually the highest setpoint valve) fails to open. Since the testing demonstrated that the other valves would actually open within values assumed in the safety analyses, having 2MS-11 or 1MS-8 open at a slightly higher pressure remains within the bounds of the analyses. The 1MS-8 results were additionally reviewed for any potential impact due to increasing the long-term post-trip steam pressure. No adverse impact was identified, and 1MS-8 remained within the safety analysis assumptions. As a group, the MSRVs were capable of performing all required safety functions.

Since the valves' actual performance remained within the bounds of the safety analyses, these events had no impact on the predicted results of any accidents and therefore did not impact the Conditional Core Damage Probability (CCDP) or Conditional Large Early Release Probability (CLERP).

Therefore, there was no actual impact on the health and safety of the public due to this event.

ADDITIONAL INFORMATION

As stated earlier, a search was performed to identify similar prior events. This resulted in the additional events documented in this report.

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

This event is not considered reportable under the Equipment Performance and Information Exchange (EPIX) program.