



Crystal River Nuclear Plant
Docket No. 50-302
Operating License No. DPR-72

Ref: 10 CFR 50.73

December 8, 2010
3F1210-01

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555-0001

Subject: LICENSEE EVENT REPORT 50-302/2010-001-00

Dear Sir:

Please find enclosed Licensee Event Report (LER) 50-302/2010-001-00. The LER discusses the as-found lift setpoint for both Cycle 16 Pressurizer Code Safety Valves being outside the maximum tolerance allowed by the Crystal River Unit 3 (CR-3) Improved Technical Specifications. This condition is reportable under 10 CFR 50.73(a)(2)(i)(B) and 10 CFR 50.73(a)(2)(v)(D).

The root cause for the out-of-tolerance condition is still under evaluation. CR-3 will provide a supplement to this LER by January 28, 2011.

No new regulatory commitments are made in this letter.

If you have any questions regarding this submittal, please contact Mr. Dan Westcott, Superintendent, Licensing and Regulatory Programs, at (352) 563-4796.

Sincerely,

James W. Holt
Plant General Manager
Crystal River Nuclear Plant

JWH/dwh

Enclosure

xc: Regional Administrator, Region II
Senior Resident Inspector
NRR Project Manager

Progress Energy Florida, Inc.
Crystal River Nuclear Plant
15760 W. Power Line Street
Crystal River, FL 34428

IE22
NRR

LICENSEE EVENT REPORT (LER)

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

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.

1. FACILITY NAME CRYSTAL RIVER UNIT 3	2. DOCKET NUMBER 05000302	3. PAGE 1 of 7
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4. TITLE
As-Found Cycle 16 Pressurizer Code Safety Valve Setpoints Outside Improved Technical Specification Limit

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
10	13	2010	2010	- 001 -	00	12	08	2010		05000
									FACILITY NAME	DOCKET NUMBER
										05000

9. OPERATING MODE No Mode	11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR§: (Check all that apply)			
10. POWER LEVEL 0%	<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)
	<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 checked="" type="checkbox"/> 50.73(a)(2)(v)(D)	Specify in Abstract below or in NRC Form 366A

12. LICENSEE CONTACT FOR THIS LER

FACILITY NAME Dennis W. Herrin, Lead Engineer (Licensing and Regulatory Programs)	TELEPHONE NUMBER (Include Area Code) 352-563-4633
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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
X	AB	RV	D243	Y					

14. SUPPLEMENTAL REPORT EXPECTED <input checked="" type="checkbox"/> YES (If yes, complete 15. EXPECTED SUBMISSION DATE) <input type="checkbox"/> NO	15. EXPECTED SUBMISSION DATE	MONTH 01	DAY 28	YEAR 2011
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ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)

On September 1, 2010, and October 5, 2010, Progress Energy Florida, Inc., (PEF) Crystal River Unit 3 (CR-3) was in NO MODE (core off loaded) when Wyle Labs provided Notices of Anomaly for each of two Pressurizer Code Safety Valves (PCSVs) that had been removed during the Cycle 16 refueling outage and replaced with rotating spare PCSVs. The as-found lift setpoint for one PCSV was 5.32 percent above the Improved Technical Specification (ITS) setpoint and the other PCSV was 2.08 percent above the ITS setpoint. ITS 3.4.9 states that two PCSVs shall be operable in MODES 1, 2 and 3. To be operable, the PCSV lift setpoints must be within the maximum allowable tolerance of +/- 2 percent. The existence of similar discrepancies in these relief valves is an indication that the discrepancies may have developed over a period of time. PEF concludes that both PCSVs were inoperable during plant operation and that the condition is reportable under 10CFR50.73(a)(2)(i)(B) and 10CFR50.73(a)(2)(v)(D). This condition does not represent a reduction in the public health and safety. The root cause for this condition is still under evaluation. Corrective actions will be identified upon completion of the root cause evaluation. Similar occurrences have not been previously reported to the NRC.

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BACKGROUND

The Reactor Coolant System (RCS) [AB] forms a barrier against the release of reactor coolant and radioactive material to the Reactor Building [NH] or to the Main Steam System [SB]. Establishing a system pressure limit helps to assure the integrity of the RCS. The design pressure of the RCS is 2500 pounds per square inch gauge (psig). The maximum transient pressure of the RCS pressure vessel, RCS piping, valves and fittings is 110 percent of design pressure. Thus a safety limit of 2750 psig has been established for the RCS. Before initial plant operation, the RCS was hydrostatically tested at 3125 psig.

Normal RCS pressure control is by the pressurizer [AB, PZR] steam cushion in conjunction with the pressurizer spray and pressurizer heaters. The RCS is protected from overpressure by the Reactor Protection System [JC] features, such as the RCS high-pressure reactor trip, one Power-Operated Relief Valve (PORV) [AB, PCV], and the two pressurizer code safety valves (PCSVs) [AB, RV]. Because of these other protective features, it is unlikely that the PCSVs will ever lift during operation. RCS pressure setpoints for these features are as follows:

Pressurizer Code Safety Valves	2500 psig
Power-Operated Relief Valve	2450 psig
Reactor trips on high RCS pressure	2355 psig
RCS high pressure alarm	2255 psig
Pressurizer Spray Valve opens	2205 psig

The PCSVs protect the RCS against overpressurization during transients and accidents which involve a mismatch between the primary plant heat source and the secondary plant heat sink. Effluent from the PORV and PCSVs discharges to the Reactor Coolant Drain Tank [AB, TK].

Improved Technical Specification (ITS) 3.4.9 requires that both PCSVs be operable with a lift setting of 2500 psig +/- 2 percent (≥ 2450 psig and ≤ 2550 psig) in Modes 1, 2 and 3. When a PCSV is removed from the pressurizer for testing, it shall be reset to +/- 1 percent of the nominal setpoint.

Crystal River Unit 3 (CR-3) has four Model 31739A PCSVs manufactured by Dresser Industries with two in service during operation. PCSV testing is performed by Wyle Laboratories. During plant operation, two of the four valves are installed on the pressurizer as PCSVs (Reactor Coolant Valves (RCV)-8 and RCV-9) and the other two valves are spares. Hence, the individual valves "rotate" through their assignment as PCSVs on a once-per-fuel-cycle basis between tests. Both valves are removed at the end of each operating cycle, sent out for testing, and the two valves which had been tested and stored at the site since the previous cycle are installed on the pressurizer.

EVENT DESCRIPTION

On September 1, 2010, Progress Energy Florida, Inc., (PEF) CR-3 was in NO MODE (core off loaded) at 0 percent RATED THERMAL POWER when Wyle Laboratories provided a Notice of Anomaly for a PCSV (Serial Number BU-03149). This valve had been installed on the pressurizer as RCV-9 during Cycle 16 operation and was sent to Wyle Laboratories during the

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Cycle 16 refueling outage (R16). The highest lift pressure recorded (2633 psig) was 5.32 percent above the ITS setpoint and 3.32 percent higher than the ITS maximum allowed "as-found" lift pressure. This condition was documented in the CR-3 Corrective Action Program as Nuclear Condition Report (NCR) 420022 on September 2, 2010.

The above condition was not considered to be reportable based on the guidance of NUREG-1022, Section 3.2.2, Example 3, "As discussed above, discrepancies found in technical specifications surveillance tests should be assumed to occur at the time of the test unless there is firm evidence, based on a review of relevant information (e.g., the equipment history and the cause of the failure) to indicate that the discrepancy occurred earlier." Relevant information at this time did not support a reportable condition.

On October 5, 2010, CR-3 was in NO MODE (core off loaded) at 0 percent RATED THERMAL POWER when Wyle Laboratories provided a Notice of Anomaly for a second PCSV (Serial Number BL-08899). This valve had been installed on the pressurizer as RCV-8 during Cycle 16 operation and was sent to Wyle Laboratories during R16. The highest lift pressure recorded (2552 psig) was 2.08 percent above the ITS setpoint and 0.08 percent higher than the ITS maximum allowed "as-found" lift pressure. This condition was documented in the CR-3 Corrective Action Program as NCR 426852 on October 13, 2010.

The above condition is considered to be reportable based on the further guidance of NUREG-1022, Section 3.2.2, Example 3, "However, 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. If so, the condition existed during plant operation and the event is reportable under § 50.73(a)(2)(i)(B)."

Valve	Serial Number	Set Pressure	Acceptable Range	As-Found Set Pressure	Result %
RCV-9	BU-03149	2500 psig	2450 - 2550	2633	+ 5.32
RCV-8	BL-08899	2500 psig	2450 - 2550	2552	+ 2.08

ITS 3.4.9 states that the two PCSVs shall be OPERABLE in MODES 1, 2 and 3. With one PCSV inoperable, restore the valve to an OPERABLE status within 15 minutes or be in MODE 3 within 6 hours and be in MODE 4 within 12 hours. With two PCSVs inoperable, be in MODE 3 within 6 hours and be in MODE 4 within 12 hours. Since CR-3 was in NO MODE when the PCSVs as-found lift setpoints were identified as being outside of the maximum allowable tolerance range, ITS 3.4.9 Required Actions A.1, B.1 and B.2, were not applicable.

Both PCSVs being inoperable during plant operation is a condition prohibited by the CR-3 ITS. This condition is reportable under 10CFR50.73(a)(2)(i)(B).

CAUSE

CR-3 requires additional time to complete the root cause evaluation for multiple PCSVs lift setpoints being found outside of the maximum allowable tolerance. PCSV RCV-8 and RCV-9 were removed from the plant after shutdown for R16 and sent to Wyle Laboratories for testing and repairs/refurbishment by Dresser. The spare PCSVs were installed in the plant. Valve test

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results received from Wyle Laboratories need to be factored into the root cause evaluation. A supplemental Licensee Event Report (LER) will be submitted to the NRC by January 28, 2011.

SAFETY CONSEQUENCES

The design pressure for the RCS is 2500 psig. Enhanced Design Basis Document Tab 6/1, "Reactor Coolant System," states the total PCSV capacity to be such that RCS pressure will not exceed 110 percent of system design pressure (2750 psig) to protect the RCS from exceeding the American Society of Mechanical Engineer (ASME) code safety limit. The set pressure of the PCSVs is +/- 2 percent (≥ 2450 psig and ≤ 2550 psig) of the lift setpoint (2500 psig) with a design capacity for each valve of 317,973 pounds mass per hour.

An engineering evaluation concluded that the credited protection criterion of the RCS not exceeding 110 percent of the ASME code allowable pressure could not be demonstrated to have existed over the last operating cycle (Cycle 16). Using straight line projection, the PCSV that had an as-found lift pressure of 2.08 percent above the ITS setpoint would have allowed an RCS peak pressure of approximately 2752.1 psig. The PCSV that had an as-found lift pressure of 5.32 percent above the ITS setpoint would have allowed an RCS peak pressure of approximately 2839.9 psig. Accidents that may be adversely impacted due to the PCSVs being set above the ITS setpoint are the Moderator Dilution Accident, the Startup Accident, the Rod Ejection Accident, the Feedwater Line Break Accident and the Loss of Feedwater Accident. Although the RCS safety limit of 2750 psig would have been exceeded, the RCS was hydrostatically tested at 3125 psig prior to initial plant operation. This value would not have been exceeded during the accident scenarios identified above.

Based on the above, the identified condition is reportable as a condition that could have prevented the fulfillment of the PCSV safety function to mitigate the consequences of an accident and is reportable under 10CFR50.73(a)(2)(v)(D). Since the identified condition could not have prevented the fulfillment of the PCSV safety function to mitigate the consequences of an accident at the time of discovery, it is not reportable under 10CFR50.72(b)(3)(v)(D).

The identified condition meets the definition of a Safety System Functional Failure as defined in Nuclear Energy Institute (NEI) 99-02, "Regulatory Assessment Performance Indicator Guideline," since it is reportable under 10CFR50.73(a)(2)(v)(D).

A probabilistic safety assessment evaluation was performed for the identified condition. With either PCSV failing to open, the change in Core Damage Frequency (CDF) was less than $1e-06$ (low safety significance). With both PCSVs failing to open, the change in CDF was approximately $5e-05$ (high to moderate safety significance). However, failing both PCSVs is not representative of the identified condition. Using the change in CDF associated with one PCSV failing to open is more accurate, although still a very conservative bounding analysis, since the as-found condition is that the PCSVs opened late instead of failing to open. The overall conclusion is that the identified condition is of low safety significance.

Based on the above, PEF concludes that the inoperable condition of RCV-8 and RCV-9 did not represent a reduction in the public health and safety.

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CORRECTIVE ACTIONS

Corrective actions are being developed as part of the root cause evaluation and will be tracked in the CR-3 Corrective Action Program under NCR 426852.

ADDITIONAL INFORMATION

All four PCSVs (two installed, two rotational spares) are Model 2-1/2-31739A-1 closed bonnet maxiflow valves manufactured by Dresser Industrial Valve & Instrument Division.

PREVIOUS SIMILAR EVENTS

Previous occurrences of PCSV setpoints being found outside their required tolerance have not been reported by CR-3 to the NRC in a LER.

ATTACHMENTS

Attachment 1 - Abbreviations, Definitions, and Acronyms

Attachment 2 - List of Commitments

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ATTACHMENT 1

ABBREVIATIONS, DEFINITIONS AND ACRONYMS

ASME	American Society of Mechanical Engineers
CDF	Core Damage Frequency
CFR	Code of Federal Regulations
CR-3	Crystal River Unit 3
ITS	Improved Technical Specifications
LER	Licensee Event Report
NCR	Nuclear Condition Report
NEI	Nuclear Energy Institute
NUREG	NRC Nuclear Regulation
PCSV	Pressurizer Code Safety Valve
PEF	Progress Energy Florida, Inc.
PORV	Power-Operated Relief Valve
psig	pounds per square inch gauge
R16	Refueling Outage 16
RCS	Reactor Coolant System
RCV	Reactor Coolant Valve

NOTES: Improved Technical Specification Defined terms appear capitalized in LER text {e.g., MODE 1}.

Defined terms/acronyms/abbreviations appear in parenthesis when first used {e.g., Reactor Building (RB)}.

EIIS codes appear in square brackets {e.g., reactor building penetration [NH, PEN]}

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Attachment 2

LIST OF COMMITMENTS

The following table identifies those actions committed by PEF in this document. Any other actions discussed in the submittal represent intended or planned actions by PEF. They are described to the NRC for the NRC's information and are not regulatory commitments. Please notify the Superintendent, Licensing and Regulatory Programs of any questions regarding this document or any associated regulatory commitments.

COMMITMENT	DUE DATE
No new regulatory commitments are contained in this submittal.	N/A