



Florida Power & Light Company, 6501 South Ocean Drive, Jensen Beach, FL 34957

January 18, 2002

L-2002-013
10 CFR § 50.73

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

Re: St. Lucie Unit 2
Docket No. 50-389
Reportable Event: 2001-002-00
Date of Event: November 25, 2001
As-Found Cycle 12 Main Steam Safety Valve
Setpoints Outside Technical Specification Limits

The attached Licensee Event Report 2001-002 is being submitted pursuant to the requirements of 10 CFR § 50.73 to provide notification of the subject event.

Very truly yours,

A handwritten signature in black ink, appearing to read 'Donald E. Jernigan', is written over the typed name.

Donald E. Jernigan
Vice President
St. Lucie Nuclear Plant

DEJ/KWF

Attachment

IE22

LICENSEE EVENT REPORT (LER)

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

Estimated burden per response to comply with this mandatory information collection request: 50 hrs. Reported lessons learned are incorporated into the licensing process and fed back to industry. Forward comments regarding burden estimate to the Records Management Branch (T-6 F33), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, and to the Paperwork Reduction Project (3150-0104), Office of Management and Budget, Washington, DC 20503. If 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.

FACILITY NAME (1) St. Lucie Unit 2	DOCKET NUMBER (2) 05000389	PAGE (3) Page 1 of 5
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TITLE (4)
As-Found Cycle 12 Main Steam Safety Valve Setpoints Outside Technical Specification Limits

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
11	25	2001	2001	002	00	01	18	2002	FACILITY NAME	DOCKET NUMBER

OPERATING MODE (9) 1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)									
POWER LEVEL (10) 68	20.2201(b)	20.2203(a)(3)(ii)	50.73(a)(2)(ii)(B)	50.73(a)(2)(ix)(A)						
	20.2201(d)	20.2203(a)(4)	50.73(a)(2)(iii)	50.73(a)(2)(x)						
	20.2203(a)(1)	50.36(c)(1)(i)(A)	50.73(a)(2)(iv)(A)	73.71(a)(4)						
	20.2203(a)(2)(i)	50.36(c)(1)(ii)(A)	50.73(a)(2)(v)(A)	73.71(a)(5)						
	20.2203(a)(2)(ii)	50.36(c)(2)	50.73(a)(2)(v)(B)	OTHER						
	20.2203(a)(2)(iii)	50.46(a)(3)(ii)	50.73(a)(2)(v)(C)	Specify in Abstract below or in NRC Form 366A						
	20.2203(a)(2)(iv)	50.73(a)(2)(i)(A)	50.73(a)(2)(v)(D)							
	20.2203(a)(2)(v)	X 50.73(a)(2)(i)(B)	50.73(a)(2)(vii)							
	20.2203(a)(2)(vi)	50.73(a)(2)(i)(C)	50.73(a)(2)(viii)(A)							
20.2203(a)(3)(i)	50.73(a)(2)(ii)(A)	50.73(a)(2)(viii)(B)								

LICENSEE CONTACT FOR THIS LER (12)	
NAME Kenneth W. Frehafer, Licensing Engineer	TELEPHONE NUMBER (include Area Code) (561) 467 - 7748

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)									
CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX
X	SB	RV	C710	YES	-	-	-	-	-

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

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

On November 25, 2001, St. Lucie Unit 2 was in Mode 1 and holding at approximately 68 percent reactor power for Technical Specification testing of the main steam safety valves setpoints. Four main steam safety valves lifted outside the Technical Specification limits of +1 percent to -3 percent. Two of the valves (V8208 and V8212) were retested and/or adjusted and placed back in service, another was left out of service since it was scheduled for an overhaul (V8213), and the last valve was left out of service because its as-found setting exceeded 3 percent high (V8201).

With the exception of V8201, the cause of the high setting was setpoint drift. V8201's test failure was due to aging effects. V8201 and V8213 were overhauled and reinstalled during the refueling outage. The preventative maintenance overhaul frequency for main steam safety valves were reviewed and FPL determined that no changes needed to be made to the scheduled valve maintenance.

Operation of the facility with the as-found setting was within analytical bounds, therefore, this event had no impact on the health and safety of the public.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
St. Lucie Unit 2	05000389	2001	002	00	Page 2 of 5

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

Description of the Event

On November 25, 2001, St. Lucie Unit 2 was in Mode 1 and holding at approximately 68 percent reactor power for testing of the main steam safety valves (MSSVs) [EIIS:SB:RV] during the downpower for the SL2-13 refueling outage. The Technical Specifications (TS) surveillance testing was performed in accordance with procedure 2-MSP-08.07, "Main Steam Safety Setpoint Surveillance." The following four MSSVs lifted outside the TS limits of +1 percent to -3 percent. The findings are listed in Table 1.

Unit 2 Valve Tag	As-Found Setting (psig)	As-Found Technical Spec. Setting (psig)	Design (Nameplate) Setting (psig)	Percentage Deviation from Design
V8201	1023.8	955.3 to 995.3	985	+3.9
V8208	998.9	955.3 to 995.3	985	+1.4
V8212	1044.3	994.1 to 1035.7	1025	+1.9
V8213	1049.0	994.1 to 1035.7	1025	+2.3

Valves V8207, V8211, V8216, V8202, and V8209 tested satisfactory. Valves V8208 and V8212 were retested and/or adjusted within the action time of TS 3.7.1.1. During the test, the reactor trip setpoints had been reduced to allow continued operation with two inoperable MSSVs per train. Valve V8213 was left out of service (OOS) to expedite testing since it was scheduled for preventative maintenance (PM) overhaul. Valve V8201 was also left OOS since the as-found exceeded 3 percent high and by Code requirements a cause determination is required before the valve can be returned to service. Note that V8201 was also already scheduled for PM overhaul.

Cause of the Event

The apparent cause of the high as-found settings for V8208, V8212, and V8213 is setpoint drift. V8213 was already scheduled for an overhaul, and no additional corrective actions are warranted for V8208 and V8212.

The cause for the high as-found setting for V8201 was aging. The as-found setting for V8201 was 1023.8 psig which is 3.9 percent above the design setting of 985 psig. The valve was left OOS because 2-MSP-08.07 does not allow any adjustments for valves that exceed the +/- 3 percent tolerance. The procedure also mandates cause determination before returning the valve to service in accordance with ANSI/ASME OM-1987, Part 1, code. V8201 was sent offsite for overhaul and cause determination by Crosby and re-certification by Wyle Labs. Preliminary inspection results show that the internals were dirty and rusty, radial scarring was found on the adjusting bolt radius and bearing adapter angle, and the spindle OD and guide bearing area ID was rusted with a debris build-up between the two guide areas. This debris build up may have contributed to the high as-found setting. Additionally, the radial scarring within the load train of the valve may have also contributed to the high as-found setting.

FPL requires that the MSSVs be periodically overhauled every 72 months (56 months for Unit 1 MSSVs due to material differences) to minimize valve internal corrosion. FPL reviewed historical data since 1994 and determined that this is the first valve that exceeded the +3 percent criteria due to aging effects. Thus, the MSSV PM frequency

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
St. Lucie Unit 2	05000389	2001	002	00	Page 3 of 5

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

has been effective in preventing valves from exceeding the +3 percent ASME criterion. Therefore, no PM frequency change is warranted at this time.

Analysis of the Event

This event is reportable under 10 CFR 50.72(a)(2)(i)(B) as "any operation or condition prohibited by the plant's Technical Specifications."

Analysis of Safety Significance

The MSSVs must open to provide overpressure protection for the steam generators and relief capacity to remove decay heat. The MSSVs are classified as safety related, Quality Group B components. Per TS table 3.7-1, the maximum allowable power level high trip setpoint with two inoperable steam line safety valves on either operating steam generator is 79.8%. No more than two valves per train were out of service and the reactor trip setpoints were properly adjusted in accordance with Technical Specification 3.7.1.1, therefore there were no operability concerns during the performance of the surveillance.

FPL evaluated the Unit 2 MSSV current and historical surveillance test data from 1994 to 2000 to assess the setpoint drift. This review showed that the valves were set correctly. Additionally, the percentage change in the SL2-13 as-found setpoints is actually the setpoint drift plus data scatter based on the as-left test averages (last two consecutive tests) from the previous cycles. Based on the data reviewed, the > 3 percent high setting of V8201 is unusual, and none of the other valves have exceeded +3 percent due to drift and data scatter. This review concludes that although valve setpoint drift random in nature, the magnitude of the drift is capable of complying with a 3 percent OM-1 threshold.

The UFSAR analyses that could be potentially affected by the out of specification as-found MSSV setpoint are:

- 1) Steam Generator Tube Rupture
- 2) Asymmetric Steam Generator Transient
- 3) Feedwater Line Break
- 4) Loss of Condenser Vacuum (LOCV)
- 5) Control Element Assembly Withdrawal (CEAW)
- 6) Small Break LOCA (SBLOCA)

The analyses of the steam generator tube rupture, asymmetric steam generator transient, and feedwater line break events use a valve tolerance of +/- 3 percent. Since the average valve lift pressure (using either the average or the worst test lift-pressure for each valve on each header) was within +1 and -3 percent tolerance, there would be no adverse impact on the current safety analysis of these events. Thus, the safety analysis acceptance criteria, with the as-found setpoints of the listed valves, would not result in violation of any safety limits for these events.

The analyses of the LOCV, CEAW, and SBLOCA events use a valve upper bound tolerance of +1 percent and support any tolerance value of less than or equal to +1 percent, since a lower value would produce less adverse consequences.

In the SBLOCA analysis of record, the steam mass flow rate through MSSVs is small and does not require the full steam relieving capacity of the MSSVs. Opening of only 2

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
St. Lucie Unit 2	05000389	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	Page 4 of 5
		2001	- 002	- 00	

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

Bank 1 valves on each header is sufficient to meet the analysis required steam relieving capacity. Since at least two valves for Bank 1 on each header would have opened within a tolerance of +1 percent, the SBLOCA analysis of record would remain bounding for the identified valve conditions.

For pressurization events, such as the LOCV event, averaging of the valve lift pressures is acceptable when assessing the impact on the maximum system pressure, where this maximum pressure is not within the range of valve lift pressures. The average measured valve lift-pressure on each header was within a +1 percent tolerance. Since the analysis of record for this event considered a +1 percent tolerance for each MSSV, and results of this analysis meet safety analysis acceptance criteria, it can be concluded that the analysis of a LOCV event using the as-found lift setpoints would not violate any safety limits.

For CEAW events without a reactor trip, the MSSV setpoint determines the reactor coolant system (RCS) conditions and the required initial thermal margin. For these cases, MSSVs open and then cycle about a more or less constant pressure. The secondary side pressurization rate for these CEAW events is not rapid, and the MSSV opening setpoint rather than the full relieving capacity of all valves in a bank is important to maintain the analysis secondary side response or RCS conditions. Since the CEAW analysis assumes MSSVs opening setpoint within +1 percent tolerance, and at least three Bank 1 valves on each header had lift pressure within this limit, the analysis of record would be bounding for the conditions described in this LER. For other CEAW cases, including events terminated by a reactor trip, the opening of MSSVs stops the RCS temperature rise, at which point the power starts to increase until the reactor trips on overpower. With at least three MSSVs opening within the analysis setpoint value of +1 percent tolerance, the analysis of record would not be adversely impacted for the case of as-found valve conditions addressed in this LER. The analysis of CEAW event thus would continue to meet the analysis acceptance criteria.

Based on the evaluation performed, FPL concluded that no safety analysis limits would have been violated for any of the UFSAR analyzed events during St. Lucie Unit 2 Cycle 12 operations. Plant operation remained within the design basis of the plant. Setpoint drift is random in nature. Therefore, this event poses no adverse impact on the health and safety of the public.

Corrective Actions

1. V8201 has been removed, shipped offsite, reworked by Crosby, recertified by Wyle, and reinstalled during the St. Lucie Unit 2 SL2-13 refueling outage via WO 31001446.
2. V8213 has been removed, shipped offsite, reworked by Crosby, recertified by Wyle, and reinstalled during the St. Lucie Unit 2 SL2-13 refueling outage via WO 31001442.

Additional Information

Failed Components Identified

Component: Main Steam Safety Valve
 Manufacturer: Crosby,
 Model Number: Style HA-55-FN size 6R10, direct acting, spring loaded, open bonnet valve

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
St. Lucie Unit 2	05000389	2001	- 002	- 00	Page 5 of 5

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

Similar Events

LER 50-335/1999-004-00, "Main Steam Safety Valves Surveillance Outside Technical Specification Requirements."