



Tennessee Valley Authority, Post Office Box 2000, Soddy Daisy, Tennessee 37384-2000

April 22, 2011

10 CFR 50.73

ATTN: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

Sequoyah Nuclear Plant, Unit 1
Facility Operating License No. DPR-77
NRC Docket Nos. 50-327

Subject: **License Event Report 327/2011-002, "Feedwater Regulator Valve Inoperable"**

The enclosed licensee event report provides details concerning the failure of the loop 3 feedwater regulator valve and exceeding the technical specifications allowed outage time for correction of the issue. This report is being submitted in accordance with 10 CFR 50.73 (a)(2)(i)(B), as any operation or condition that was prohibited by technical specifications.

There are no regulatory commitments contained in this letter. Should you have any questions concerning this submittal, please contact G. M. Cook, Sequoyah Site Licensing Manager, at (423) 843-7170.

Respectfully,

A handwritten signature in black ink that reads "Mike Skaggs". The signature is written in a cursive, slightly slanted style.

Michael D Skaggs
Site Vice President
Sequoyah Nuclear Plant

Enclosure: Licensee Event Report - Feedwater Regulator Valve Inoperable

cc: NRC Regional Administrator – Region II
NRC Senior Resident Inspector – Sequoyah Nuclear Plant

Handwritten initials "TE22" with "NRC" written below them. The "TE22" is written in a large, bold, sans-serif font, and "NRC" is written in a smaller, similar font below it.

U.S. Nuclear Regulatory Commission
Page 2
April 22, 2011

GMC:JWP:SKD

Enclosure

bcc (Enclosure):

NRC Project Manager – Sequoyah Nuclear Plant
Institute of Nuclear Power Operations

G. Arent
P. M. Billingsley
S. M. Connors
G. M. Cook
R. M. Cook
D. A. Day
R. E. Detwiler
G. D. Franceschi
D. E. Jernigan
R. M. Krich
K. Langdon
C. P. Dieckmann Jr.
NSRB Support
P. D. Swafford
E. J. Vigluicci
C. T. Ware
J. D. Williams
WBN Site Licensing Files
EDMS

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 FOIA/Privacy Section (T-5 F52), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to infocollects.resources@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
Sequoyah Nuclear Plant Unit 1**2. DOCKET NUMBER**
05000327**3. PAGE**
1 OF 5**4. TITLE:**
Feedwater Regulator Valve Inoperable

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
02	15	2010	2011	002	00	04	22	2011	FACILITY NAME	DOCKET NUMBER

9. OPERATING MODE
1**11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §:** (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) |
| <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 |

10. POWER LEVEL
100**12. LICENSEE CONTACT FOR THIS LER**FACILITY NAME
Rusty ProffittTELEPHONE NUMBER (Include Area Code)
(423) 843-6651**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
D	SJ	FCV	F127	N					

14. SUPPLEMENTAL REPORT EXPECTED☐ YES (If yes, complete 15. EXPECTED SUBMISSION DATE) ☒ NO**15. EXPECTED SUBMISSION DATE**

MONTH	DAY	YEAR

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

On November 15, 2010, at 2218 Eastern Standard Time (EST), Sequoyah Nuclear Plant (SQN) Unit 1 entered Technical Specification Limiting Condition for Operation (LCO) 3.7.1.6 Action b because the loop 3 main feedwater regulating valve (MFRV) was leaking resulting in an increase in steam generator Number 3 level. Subsequently, on November 16, at 0233 EST the loop 3 MFRV was isolated as required by LCO 3.7.1.6 Action b, because of excessive seat leakage. On February 21, 2011, it was determined that the maintenance activity performed on the MFRV to replace the diaphragm affected the seating of the valve. Therefore, the valve was inoperable from the time the unit entered Mode 3 until it was identified that the Loop 3 MFRV was leaking by its seat. LCO 3.7.1.6 requires the MFRVs to be operable in Modes 1, 2, and 3. The cause was determined to be a lack of procedural guidance to verify stem position following reassembly of the valve and the post maintenance testing was not sufficient to validate a positive seating of the valve. The applicable maintenance instruction is being revised to verify stem connector / anti-rotation device is properly secure and will include a verification that the valve is properly seated. A post maintenance test is being developed for the MFRVs and bypass MFRVs to ensure the isolation function can be achieved.

U.S. NUCLEAR REGULATORY COMMISSION
LICENSEE EVENT REPORT (LER)
CONTINUATION SHEET

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
Sequoyah Nuclear Plant Unit 1	05000327	YEAR	SEQUENTIAL NUMBER	REV NO.	2 OF 5
		2011	-- 002	-- 00	

NARRATIVE**I. PLANT CONDITION(S)**

At the time of the event Sequoyah Nuclear Plant (SQN) Unit 1 was operating at approximately 1 percent power during start-up following a refueling outage.

II. DESCRIPTION OF EVENT**A. Event:**

On November 15, 2010, at 2218 Eastern Standard Time (EST), SQN Unit 1 entered Technical Specification (TS) Limiting Condition for Operation (LCO) 3.7.1.6 Action b because the loop 3 main feedwater regulating valve (MFRV) [EIIIS Code SJ] was leaking resulting in an increase in steam generator (SG) [EIIIS code AB] Number 3 level. Subsequently, on November 16, 2010, at 0233 EST, the loop 3 MFRV was isolated as required by LCO 3.7.1.6 Action b, because of excessive seat leakage.

On February 21, 2011, it was determined that the maintenance activity performed on the MFRV to replace the diaphragm and o-rings on the valve actuator during the Unit 1 Cycle 17 refueling outage resulted in the inoperability of the valve. Therefore, the valve was inoperable from the time the unit entered Mode 3 until it was identified that the Loop 3 MFRV was inoperable and isolated. This resulted in exceeding LCO 3.7.1.6 Action b. allowed outage time of 72 hours to return the MFRV to operable status or close or isolate the MFRV. Therefore, this event is being reported as a condition that was prohibited by TS.

B. Inoperable Structures, Components, or Systems that Contributed to the Event:

None.

C. Dates and Approximate Times of Major Occurrences:

Date	Description
October 11, 2010	Maintenance activity performed on the MFRV to replace the diaphragm and o-rings on the actuator.
November 12, 2010 at 2326 EST	Unit 1 entered Mode 3.
November 15, 2010 at 0547 EST	Unit 1 entered Mode 2.

U.S. NUCLEAR REGULATORY COMMISSION
LICENSEE EVENT REPORT (LER)
CONTINUATION SHEET

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
Sequoyah Nuclear Plant Unit 1	05000327	YEAR	SEQUENTIAL NUMBER	REV NO.	3 OF 5
		2011	-- 002	-- 00	

NARRATIVE

Date	Description
November 15, 2010 at 2218 EST	After placing a main feedwater pump in service, SG Number 3 level increased with the MFRV and MFRV bypass valves closed. Leak identification indicated that the Loop 3 MFRV was leaking. TS Limiting Condition for Operation (LCO) 3.7.1.6. Action b was entered.
November 16, 2010 at 0233 EST	The Loop 3 MFRV was isolated to comply with TS LCO 3.7.1.6. Action b.
November 16, 2010 at 1915 EST	TS LCO 3.0.6 was entered for opening the isolation valve to Loop 3 for verification of the associated MFRV operability.
November 16, 2010 at 2049 EST	The Loop 3 MFRV was declared operable and TS LCOs 3.0.6 and LCO 3.7.1.6. were exited
February 21, 2011	The cause evaluation concluded the maintenance activity performed during the Unit 1 Cycle 17 outage resulted in the inoperability of the MFRV.

D. Other Systems or Secondary Functions Affected:

No other systems or secondary functions were affected by this event.

E. Method of Discovery:

Control room personnel identified an uncontrolled increase in steam generator Number 3 level from main control room indicators.

F. Operator Actions:

The operators identified an uncontrolled rise in SG Number 3 resulting from a leaking MFRV. The Operators entered TS LCO 3.7.1.6 Action b. and manually isolated the Loop 3 MFRV. There was no abnormal increase in SG Number 3 identified with the Loop 3 MFRV isolated.

G. Safety System Responses:

No safety systems were actuated during this event.

LICENSEE EVENT REPORT (LER) CONTINUATION SHEET

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
Sequoyah Nuclear Plant Unit 1	05000327	YEAR	SEQUENTIAL NUMBER	REV NO.	4 OF 5
		2011 -- 002 -- 00			

NARRATIVE

III. CAUSE OF THE EVENT

A. Immediate Cause:

The immediate cause of the Loop 3 MFRV leaking was an anti-rotation device on the valve stem was not properly secured.

B. Root Cause:

The root cause was identified as an inadequate preventative maintenance procedure. The preventative maintenance procedure did not verify that there was no stem rotation during reassembly of the valve following maintenance on the valve. Additionally, the post maintenance test was not sufficient to identify the capability of the valve to perform its isolation function.

IV. ANALYSIS OF THE EVENT

The condition of the Loop 3 MFRV not being capable of performing its isolation function and exceeding LCO 3.7.1.6 Action b allowed outage time is reportable in accordance with 10 CFR 50.73(a)(2)(i)(B), as any operation or condition which was prohibited by TS.

Isolation of the main feedwater (MFW) system is provided when required to mitigate the consequences of a steam line break, feedwater line break, excessive feedwater flow, and loss of normal feedwater (and station blackout) accident. Redundant isolation capability is provided on each feedwater line consisting of the feedwater isolation valve (MFIV) and the MFRV and its associated bypass valve. The safety function of these valves is fulfilled when the valve is closed or isolated by a closed manual isolation valve. Therefore, the feedwater isolation function would have been performed by the operable redundant feedwater isolation valve. Additionally, the main feedwater pump would trip on a feedwater isolation signal, thereby effectively isolating feedwater flow from the condensate system.

V. ASSESSMENT OF SAFETY CONSEQUENCES

Based on the above "Analysis of The Event," this event did not adversely affect the health and safety of plant personnel or the general public.

VI. CORRECTIVE ACTIONS

A. Immediate Corrective Actions:

The immediate corrective action was to identify and isolated the leaking valve. The valve was repaired and returned to operable status.

U.S. NUCLEAR REGULATORY COMMISSION
**LICENSEE EVENT REPORT (LER)
CONTINUATION SHEET**

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
Sequoyah Nuclear Plant Unit 1	05000327	YEAR	SEQUENTIAL NUMBER	REV NO.	5 OF 5
		2011	-- 002	-- 00	

NARRATIVE**B. Corrective Actions to Prevent Recurrence:**

Corrective actions will be implemented to revise the preventative maintenance procedure on the MFRV and bypass MFRV to verify stem connector/anti-rotation device is secure and visually verify there is no rotation of the actuator or valve stem during valve reassembly following maintenance activities. Additionally, the post maintenance test is to be revised to ensure the capability of the valve to perform its isolation function.

VII. ADDITIONAL INFORMATION**A. Failed Components:**

The failed component was a Fisher, Model Number 667ENA flow control valve.

B. Previous LERs on Similar Events:

A review of previous reportable events for the past three years identified one previous similar event associated with failure of a MFRV. LER 50-327/2009-005-00 dated July 6, 2009 was associated with a failure of a MFRV. The failure of the MFRV was the result of a diaphragm failure. The diaphragm failure was attributed to an improper clamping force of the diaphragm to the actuator stem. The insufficient clamping force allowed stress concentrations at the diaphragm hole, which caused a tear and failure of the diaphragm. The root cause of the MFRV failure was determined to be that the governing vendor manual control procedure did not require checking for updates to non-safety related vendor manuals. The corrective actions could not have prevented this event.

C. Additional Information:

None.

D. Safety System Functional Failure:

This event did not result in a safety system functional failure in accordance with 10 CFR 50.73(a)(2)(v).

E. Unplanned Scram with Complications:

This event did not result in an unplanned scram with complications.

VIII. COMMITMENTS

None.