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Gentlemen:

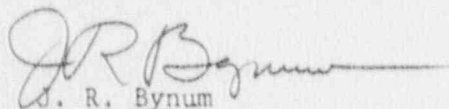
TENNESSEE VALLEY AUTHORITY - SEQUOYAH NUCLEAR PLANT UNIT 2 - DOCKET
NO. 50-328 - FACILITY OPERATING LICENSE DPR-77 - LICENSEE EVENT REPORT
(LER) 50-328/90018

The enclosed LER provides details concerning an entry into Limiting
Condition for Operation 3.0.3 when residual heat removal (RHR) cold leg
injection Cross Tie Valve 2-FCV-74-35 was closed as part of preplanned
maintenance testing activities. Closure of 2-FCV-74-35 renders both
trains of RHR cold leg injection inoperable. This event is being
reported in accordance with 10 CFR 50.73(a)(2)(i) as an operation
prohibited by technical specifications.

If you have any questions concerning this matter, please call M. A. Cooper
at (615) 843-8422.

Very truly yours,

TENNESSEE VALLEY AUTHORITY


J. R. Bynum

Enclosure
cc: See page 2

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U.S. Nuclear Regulatory Commission

cc (Enclosure):

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LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Sequoyah Nuclear Plant, Unit 2 DOCKET NUMBER (2) | PAGE (3)
050003 2 8 10 05

TITLE (4) Limiting Condition for Operation 3.0.3 entered when a residual heat removal cold leg injection cross-tie isolation valve was closed as part of preplanned maintenance activities.

EVENT DAY (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)		
MONTH	DAY	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAMES	DOCKET NUMBER(S)		
11	20	90	0	1	8	0	0	12 21 90		050003	

OPERATING MODE (9) | THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5: (Check one or more of the following)(11)

2	20.402(b)	20.405(c)	50.73(a)(2)(iv)	73.71(b)
	20.405(a)(1)(i)	50.36(c)(1)	50.73(a)(2)(v)	73.71(c)
	20.405(a)(1)(ii)	50.36(c)(2)	50.73(a)(2)(vii)	OTHER (Specify in
10 0 4	20.405(a)(1)(iii)	X 50.73(a)(2)(i)	50.73(a)(2)(viii)(A)	Abstract below and in
	20.405(a)(1)(iv)	50.73(a)(2)(ii)	50.73(a)(2)(viii)(B)	Text, NRC Form 366A
	20.405(a)(1)(v)	50.73(a)(2)(iii)	50.73(a)(2)(x)	

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER
Russell R. Thompson, Compliance Licensing Engineer	6 1 5 8 4 3 - 7 4 7 0

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS

SUPPLEMENTAL REPORT EXPECTED (14)

YES (If yes, complete EXPECTED SUBMISSION DATE) | X | NO | DATE (15)

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

On November 21, 1990, at 1530 Eastern standard time (EST), with Unit 2 in Mode 2 (approximately four percent reactor power), Limiting Condition for Operation (LCO) 3.0.3 was entered when residual heat removal (RHR) cross-tie Valve 2-FCV-74-35 was closed to perform maintenance to correct the valve's torque switch setting. The torque switch setting had been incorrectly set as the result of inappropriate personnel actions during previous testing. Closure of 2-FCV-74-35 renders both trains of RHR inoperable. At 1738 EST, testing associated with the torque switch setting was completed, and LCO 3.0.3 was exited. LCO 3.0.3 was again entered from 1807 EST to 1809 EST on November 21, 1990, to perform valve stroke time testing on 2-FCV-74-35. Additional training and procedure revisions will be made to prevent recurrence of the incorrect torque switch setting.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

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		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
Sequoyah Nuclear Plant Unit 2	05000328	90	018	00	02	015	

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

Description of Event

On November 21, 1990, at 1530 Eastern standard time (EST), with Unit 2 in Mode 2 (four percent reactor power, reactor coolant system [RCS] pressure at 2235 pounds per square inch gage, and RCS average temperature at 548 degrees Fahrenheit), Limiting Condition for Operation (LCO) 3.0.3 was entered when residual heat removal (RHR) (EIIIS Code BP) cold leg injection cross-tie Valve 2-FCV-74-35 was closed for the performance of Motor-Operated Valve Analysis and Test System (MOVATS) testing. Closure of either of the RHR cold leg injection cross-tie valves renders both trains of RHR emergency core cooling inoperable, as in this configuration, neither train alone is capable of injecting into all four RCS cold legs as required by the SQN Updated Final Safety Analysis Report (UFSAR). (Refer to UFSAR Figures 5.5.7-1 and 6.3.2-1.) MOVATS testing on 2-FCV-74-35 was completed, and the valve was returned to the normal open position at 1738 EST on November 21, 1990. LCO 3.0.3 was exited at this time. LCO 3.0.3 was again entered at 1807 EST on November 21, 1990, when 2-FCV-74-35 was closed for postmaintenance valve stroke time testing. The valve was successfully tested, declared operable, opened, and LCO 3.0.3 exited at 1809 EST on November 21, 1990.

On October 4, 1990, during the Unit 2 Cycle 4 refueling outage, 2-FCV-74-35 was MOVATS tested in accordance with Preventative Maintenance (PM) 3857, "Residual Heat Remover Heat Exchanger B Bypass Valve," and Maintenance Instruction 10.43, "Procedure for Testing Motor-Operated Valves Using MOVATS System." During the MOVATS testing, the thrust signature obtained for the valve, as reviewed by maintenance craft personnel in the field, was interpreted to indicate that the torque switch settings for the valve were too low. This was based on the conclusion, from the thrust signature interpretation, that the valve operator was equipped with a nonlocking gear set. Nonlocking gear sets allow the compression on the spring pack to be relaxed after valve operation. Previous MOVATS data for this valve had not been reviewed before testing was initiated. Subsequent investigation after this event identified that an erroneous thrust signature was obtained for this valve on October 4, most likely the result of an inadvertently repositioned switch on the test rig oscilloscope. It is speculated that the switch was inadvertently repositioned when the oscilloscope was moved for better access during the test, as the switch's correct position was verified during initial test equipment setup. Based on the initial incorrect interpretation of the thrust signature, the torque switch setting for 2-FCV-74-35 had been increased by approximately a factor of two, and the test was completed.

The PM package was subsequently reviewed by a contracted MOVATS technician, who questioned the validity of the 2-FCV-74-35 thrust signature. This evaluation speculated that the MOVATS equipment had been setup incorrectly or had malfunctioned during the test. The technician requested the senior MOVATS technician to review the thrust signature. On October 5, 1990, the senior MOVATS technician recommended that the valve be retested to verify the validity of the thrust signature. The MOVATS technician was not aware that the torque switch setting had been adjusted. The impacts of increasing the torque switch setting were apparently not recognized by Maintenance at this time. Consequently, the retest was viewed as a verification of data and was not escalated to management. Subsequent evaluation of the valve overthrust condition determined that the operability of the valve was not affected.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

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Sequoyah Nuclear Plant Unit 2	0500032090	--	018	--	0003015

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

Description of Event (Continued)

2-FCV-74-35 was retested on November 16, 1990. This test focused on obtaining a correct thrust signature for the valve. A signature indicative of a locking gear set was obtained, as expected, and the MOVATS test was completed. The torque switch setting on the valve was not verified during this test, and the field evaluation did not quantify the thrust of the valve.

The retest was reviewed by the senior MOVATS technician on November 21, 1990. This review identified that 2-FCV-74-35 was overthrusting by approximately 82 percent (32,208 pounds versus 17,664 pounds, maximum). Electrical Maintenance management and Operations were immediately notified of the overthrusting problem. A MOVATS test, which included the correct adjustment of the torque switch setting, was initiated, and LCO 3.0.3 was entered at 1530 EST on November 21, 1990.

An evaluation was performed by SQN Technical Support and Nuclear Engineering to assess any possible valve damage resulting from the overthrusting. Discussion with the valve vendor indicated that the "weak link" of the valve assembly, when subjected to overthrusting, would be the yoke-to-bonnet flanged connection. 2-FCV-74-35 was visually inspected beginning at 1754 EST on November 21, 1990. The valve body and bonnet were inspected for deformation, the bonnet-to-yoke flange was inspected for separation, the bonnet-to-yoke bolts were inspected for looseness, the valve yoke was inspected for cracks and deformation, and the valve stem was inspected for straightness while the valve was in operation. No deformation or damage was observed on 2-FCV-74-35. Based on the above inspections, it was concluded that the valve was not rendered inoperable by the overthrusting and was capable of performing its intended safety function.

Cause of Event

This event--both trains of RHR cold leg injection inoperable--was the result of planned maintenance activities to correct the torque switch setting of 2-FCV-74-35. Closure of the valve was required to perform the required MOVATS and valve stroke time testing.

The cause of the incorrect torque switch setting was an inappropriate personnel action resulting from inadequate training on MOVATS test signature analysis. A review of MOVATS training on signature analysis for nonlocking gear sets determined the training to be inadequate. A lack of clarity in the table of valve and operator thrust values also contributed to this event.

A contributing cause to this event was the failure of the craft involved in the MOVATS testing to properly escalate the issue of the questionable data. Proper escalation would have allowed retesting of the valve before unit startup.

Analysis of Event

This event is being reported in accordance with 10 CFR 50.73(a)(2)(i) as an operation prohibited by technical specifications.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

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		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER								
Sequoyah Nuclear Plant Unit 2	0150101031218	9	0	1	8	0	0	0	4	OF	0	5

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

Analysis of Event (Continued)

During accident conditions, the RHR pumps provide automatic low-head safety injection flow to the RCS following a safety injection signal, and also provide suction flow to the centrifugal charging pumps and the safety injection pumps after changeover to the containment pump from the refueling water storage tank. Specifically, at least one train of low-head safety injection flow (assuming a single active failure of the redundant train) is required to mitigate a loss of coolant accident (LOCA). The RHR low-head safety injection flow is assumed to be delivered to all four cold legs as described in SQN UFSAR, Section 6.3.2.2.

During a LOCA, three of these flow paths deliver flow to the RCS with the fourth assumed to be spilling from the faulted leg, the guillotine break being the initiating accident. Any configuration that would result in less than three cold leg injection flow paths (fourth one spilling) is inconsistent with the assumptions made in the SQN UFSAR. The valve must also be capable of closing during the transition from cold leg to hot leg injection as described in SQN UFSAR Section 6.3.2.2. Because closure of the valve was part of a preplanned test sequence, and of limited duration, this event did not affect the health and safety of the public or plant personnel.

Corrective Action

The Unit 2 LCO 3.0.3 entry was part of a preplanned maintenance activity to correct the torque switch settings on 2-FCV-74-35. LCO 3.0.3 was exited at the completion of MOVATS and valve stroke time testing. An evaluation was performed, which concluded that the overthrusting had not affected the operability of the valve.

The Electrical Maintenance employees involved in this event were counseled that when test results or data vary from the normal or expected values, they ensure the results are acceptable without question before the component is returned to service or declared operable.

Electrical Maintenance personnel certified in MOVATS signature analysis will have additional training on nonlocking gear set signatures. This training will focus on distinguishing between nonlocking gear set and erroneous signatures. This training will be completed by March 15, 1991.

In addition, the MOVATS test procedures will be revised to require the last "as left" data and thrust signatures be included in the MOVATS test package for reference. These revisions will also clarify the thrust value chart in the procedures. These revisions will be completed by August 30, 1991.

Also, training on this event for other Maintenance employees will be conducted by the Maintenance Nuclear Experience Review Update process by February 1, 1991.

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Sequoyah Nuclear Plant Unit 2	05000328	90	018	00	05 OF 05

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

Additional Information

There have been no previous LERs associated with incorrect MOVATS testing.

Commitments

1. Electrical Maintenance personnel certified in MOVATS signature analysis will have additional training on nonlocking gear set signatures. This training will focus on distinguishing between nonlocking gear set and erroneous signatures. This training will be completed by March 15, 1991.
2. The MOVATS test procedures will be revised to require the last "as left" data and thrust signatures be included in the MOVATS test package for reference. These revisions will also clarify the thrust value chart in the procedures. These revisions will be completed by August 30, 1991.
3. Training on this event for other Maintenance employees will be conducted by the Maintenance Nuclear Experience Review Update process by February 1, 1991.