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Richard T. Purcell
Site Vice President
Sequoyah Nuclear Plant

October 23, 2000

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

10 CFR 50.73

Gentlemen:

TENNESSEE VALLEY AUTHORITY - SEQUOYAH NUCLEAR PLANT (SQN) UNIT 1 - DOCKET NO. 50-327 - FACILITY OPERATING LICENSES DPR-77 - LICENSEE EVENT REPORT (LER) 50-327/2000-004

The enclosed report provides details concerning a reactor trip on low-low steam generator level as a result of the loss of a main feedwater pump. This event is being reported, in accordance with 10 CFR 50.73(a)(2)(iv), as an event that resulted in an automatic actuation of engineered safety features including the reactor protection system. There are no commitments contained in this letter.

Sincerely,

R. T. Purcell

Richard T. Purcell

Enclosure
cc: See page 2

IE22

Enclosure
cc (Enclosure):
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NRC FORM 366 (6-1998) U.S. NUCLEAR REGULATORY COMMISSION

LICENSEE EVENT REPORT (LER)

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

APPROVED BY OMB NO. 3150-0104 EXPIRES 06/30/2001

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.

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TITLE (4)

Reactor Trip on Low-Low Steam Generator Level as a Result of the Loss of a Main Feedwater Pump

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
									NA	05000
09	25	2000	2000	-- 004 --	00	10	23	2000	FACILITY NAME	DOCKET NUMBER
									NA	05000

OPERATING MODE (9)	1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)			
POWER LEVEL (10)	100	20.2201(b)	20.2203(a)(2)(v)	50.73(a)(2)(i)	50.73(a)(2)(viii)
		20.2203(a)(1)	20.2203(a)(3)(l)	50.73(a)(2)(ii)	50.73(a)(2)(x)
		20.2203(a)(2)(i)	20.2203(a)(3)(ii)	50.73(a)(2)(iii)	73.71
		20.2203(a)(2)(ii)	20.2203(a)(4)	X 50.73(a)(2)(iv)	OTHER
		20.2203(a)(2)(iii)	50.36(c)(1)	50.73(a)(2)(v)	Specify in Abstract below or in NRC Form 366A
		20.2203(a)(2)(iv)	50.36(c)(2)	50.73(a)(2)(vii)	

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER (Include Area Code)
J. Bajraszewski, Licensing Engineer	(423) 843-7749

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

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

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

On September 25, 2000, at 1033 Eastern Daylight Time, Unit 1 experienced an automatic reactor trip on low-low steam generator level. The reactor trip was preceded by a turbine runback because main feedwater pump (MFP) 1A tripped on low control oil pressure. Following the 1A MFP trip and turbine runback, the remaining MFP (1B) was not able to provide sufficient feedwater flow to maintain steam generator level, resulting in the automatic reactor trip. The root cause for the turbine runback was lower motor bearing failure on the 1A MFP main oil pump, resulting in the motor tripping on thermal overload. The root cause of the reactor trip was incorrect adjustment of the 1B MFP turbine governor, resulting in a lower control signal output and inability of the pump to provide sufficient feedwater flow. The 1A MFP turbine main oil pump motor bearing was replaced, the motor tested and returned to service. Calibration methodology of the MFP turbine governor was changed to ensure that during a transient, where one MFP is required to pickup load, the governor valve will open to provide adequate steam flow to run the pump near its maximum speed.

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

I. PLANT CONDITION(S)

Unit 1 was in power operation at approximately 100 percent reactor power.

II. DESCRIPTION OF EVENT

A. Event:

On September 25, 2000, at 1033 Eastern Daylight Time (EDT), an automatic reactor trip on low-low steam generator [EIIS Code AB]level occurred. The reactor trip was preceded by a turbine runback, because main feedwater pump (MFP) [EIIS Code SJ] 1A tripped on low control oil pressure. Following the 1A MFP trip and turbine runback, the remaining MFP (1B) was not able to provide sufficient feedwater flow to maintain steam generator level, resulting in the automatic reactor trip.

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

None.

C. Dates and Approximate Times of Major Occurrences:

September 25, 2000 at 1030 EDT	The 1A MFPT tripped, initiating a turbine runback.
At 1031 EDT	Main control room operators take manual control of: (1) the 1B MFP to ensure the output was maximized, and (2) control rods to reduce reactor power.
At 1033 EDT	The reactor trips followed by a turbine trip, because of steam generator Loop 2 low-low level. The main control room operators take appropriate actions, in accordance with the emergency operating procedures, to stabilize the reactor in Mode 3.
At 1053 EDT	Operating crew exited the emergency procedures. Unit stable in Mode 3.

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

D. Other Systems or Secondary Functions Affected:

None.

E. Method of Discovery:

The reactor and turbine trips were annunciated on the main control room panels.

F. Operator Actions:

Control room operators responded to the reactor and turbine trips as prescribed by emergency procedures. They promptly diagnosed the condition and took appropriate actions to stabilize and maintain the unit in a safe condition.

G. Safety System Responses:

The reactor protection systems, including feedwater isolation and auxiliary feedwater start, responded to the trip as designed.

III. CAUSE OF THE EVENT

A. Immediate Cause:

The immediate cause of the unit trip was the initiation of an automatic reactor trip signal, on low-low level in the Loop 2 steam generator, when the 1B MFP was not able to provide sufficient feedwater flow to maintain steam generator level.

B. Root Cause:

The root cause of the turbine runback was lower motor bearing failure on the 1A MFP main oil pump, resulting in the motor tripping on thermal overloads, and

The root cause of the trip was incorrect adjustment of the 1B MFP turbine governor, resulting in a lower control signal output and inability of the pump to provide sufficient feedwater flow.

C. Contributing Factor:

None

IV. ANALYSIS OF THE EVENT - ASSESSMENT OF THE SAFETY CONSEQUENCES

The plant safety systems responses during and after the unit trip were bounded by the responses described in the Final Safety Analysis Report. Therefore, this event did not adversely affect the health and safety of plant personnel or the general public.

V. CORRECTIVE ACTIONS

A. Immediate Corrective Actions:

The 1A MFP turbine main oil pump motor bearing was replaced, the motor tested and returned to service.

The applicable Unit 1 procedure was revised to change the calibration methodology of the MFP turbine governors to ensure that during a transient, where one MFP is required to pickup load, the governor valve will open to provide adequate steam flow to run the pump near its maximum speed.

B. Corrective Actions to Prevent Recurrence:

The associated Corrective Action Program document contains actions to:

(1) implement a modification to enhance the ability to prevent a loss of a MFP on the loss of a single oil pump;

(2) evaluate and revise the oil pump preventative maintenance program, as appropriate, based on the motor bearing failure analysis;

(3) evaluate the overall transient capability of the feed pumps to determine if runback to less than 75 percent is warranted; and

(4) the applicable Unit 2 procedure is to be revised to change calibration methodology of the MFP turbine governors to ensure that during a transient, where one MFP is required to pickup load, the governor valve will open to provide adequate steam flow to run the pump near its maximum speed.

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

VI. ADDITIONAL INFORMATION

A. Failed Components:

The lower motor bearing of a Westinghouse motor Model No. TBFC, motor style 71D21256, Serial number 7112, failed. The lower bearing is a shielded ball bearing design. Upon examination of the bearing parts, spalling (indication of metal wear) and brinelling (indication of sliding between the balls and the race) was found on the inner race. The ball bearing surfaces had a uniform oxide film indicating high temperature oxidation and contained ripple marks, characteristic of impending failure.

B. Previous LERs on Similar Events:

A review of previous reportable events for the past three years did not identify any events as a result of the loss of a MFP.

C. Additional Information:

None.

D. Safety System Functional Failure:

This event did not result in a safety system functional failure in accordance with NEI 99-02.

VII. COMMITMENTS

None.