

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Sequoyah, Unit 1	DOCKET NUMBER (2) 0 5 0 0 0 3 2 7	PAGE (3) 1 OF 0 2
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TITLE (4)  
Generator and Reactor Trip

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 NAMES		DOCKET NUMBER(S)																																									
0 5	2 1	8 4	8 4	0 3 5	0 0	0 6	1 9	8 4			0 5 0 0 0																																									
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:15%;">OPERATING MODE (9) 1</td> <td colspan="11">THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)</td> </tr> <tr> <td rowspan="5">POWER LEVEL (10) 1 0 0</td> <td>20.402(b)</td> <td>20.406(c)</td> <td><input checked="" type="checkbox"/></td> <td>50.73(a)(2)(iv)</td> <td>73.71(b)</td> </tr> <tr> <td>20.406(a)(1)(i)</td> <td>50.36(c)(1)</td> <td><input type="checkbox"/></td> <td>50.73(a)(2)(v)</td> <td>73.71(c)</td> </tr> <tr> <td>20.406(a)(1)(ii)</td> <td>50.36(c)(2)</td> <td><input type="checkbox"/></td> <td>50.73(a)(2)(vii)</td> <td rowspan="3">OTHER (Specify in Abstract below and in Text, NRC Form 366A)</td> </tr> <tr> <td>20.406(a)(1)(iii)</td> <td>50.73(a)(2)(i)</td> <td><input type="checkbox"/></td> <td>50.73(a)(2)(viii)(A)</td> </tr> <tr> <td>20.406(a)(1)(iv)</td> <td>50.73(a)(2)(ii)</td> <td><input type="checkbox"/></td> <td>50.73(a)(2)(viii)(B)</td> </tr> <tr> <td>20.406(a)(1)(v)</td> <td>50.73(a)(2)(iii)</td> <td><input type="checkbox"/></td> <td>50.73(a)(2)(x)</td> <td></td> </tr> </table>												OPERATING MODE (9) 1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)											POWER LEVEL (10) 1 0 0	20.402(b)	20.406(c)	<input checked="" type="checkbox"/>	50.73(a)(2)(iv)	73.71(b)	20.406(a)(1)(i)	50.36(c)(1)	<input type="checkbox"/>	50.73(a)(2)(v)	73.71(c)	20.406(a)(1)(ii)	50.36(c)(2)	<input type="checkbox"/>	50.73(a)(2)(vii)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)	20.406(a)(1)(iii)	50.73(a)(2)(i)	<input type="checkbox"/>	50.73(a)(2)(viii)(A)	20.406(a)(1)(iv)	50.73(a)(2)(ii)	<input type="checkbox"/>	50.73(a)(2)(viii)(B)	20.406(a)(1)(v)	50.73(a)(2)(iii)	<input type="checkbox"/>	50.73(a)(2)(x)	
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LICENSEE CONTACT FOR THIS LER (12)

NAME Glenn Duggin, Compliance Section Engineer	TELEPHONE NUMBER 6 1 5 8 7 0 1 - 6 1 4 6
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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
X	I T O Q T E	P 4 2 7		NO					
X	E J I N V T	S 2 5 0		YES					

SUPPLEMENTAL REPORT EXPECTED (14)

<input type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE) <input checked="" type="checkbox"/> NO	EXPECTED SUBMISSION DATE (15) MONTH DAY YEAR
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ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single-space typewritten lines) (16)

At 2234C on 05/21/84, unit 1 experienced a reactor trip. Unit 1 was in mode 1 (2235 psig, 578 degrees F) at 100% reactor power just prior to the event. A turbine trip occurred due to the failure of the number eleven bearing which caused the permanent magnet generator to fail. The electrical trouble alarm caused the turbine to trip and the P-9 interlock caused the reactor to trip.

At 2050C on 06/02/84, unit 1 had another reactor trip due to the number eleven bearing. Unit 1 was in mode 1 (2235 psig, 568 degrees F) at 75% reactor power just prior to the event. The turbine and reactor were manually tripped when sparks were seen coming from the bearing and excessive bearing vibration was indicated in the control room. Unit 1 stabilized at 547 degrees F following the reactor trips.

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PDR ADOCK 05000327  
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LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
Sequoyah, Unit 1	0   5   0   0   0   3   2   7	8   4	-   0   3   5	-   0   0	0   2	OF	0   2

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

On 05/21/84 at 2234C, the number eleven bearing on the turbine/generator failed causing the permanent magnetic generator (PMG) to fail and the electrical alarm to actuate and trip the generator. Since the generator was at greater than 50% power, the interlock (P-9) between the generator and the reactor tripped the reactor. Unit 1 was in mode 1 (2235 psig, 578 degrees F) at 100% reactor power just prior to the event. The bearing failure was caused by a thermocouple shorting to ground through the bearing and rotor. The thermocouple is a dual type which has an ungrounded tip and is insulated from the sheath. The thermocouple wore through the insulation and shorted to the sheath then to ground. The rotor and PMG were repaired and the thermocouple was replaced.

During this trip, a loss of the 120 VAC vital inverter 1-II also occurred. This loss caused several systems covered under Abnormal Operating Instruction (AOI) 25.2, "Loss of 120V AC Vital Instrument Power Board 1-II", to malfunction. Corrective manual actions were taken to stabilize steam generator (S/G) levels on S/Gs 3 and 4. These included starting the 'B' motor-driven auxiliary feedwater pump (MDAFW), tripping the main feedwater pumps (MFW), and isolating feedwater. The condenser circulating water (CCW) pumps had tripped and were restarted without difficulty. Ventilation isolations of the control building, the auxiliary building, and the containment building were reset and returned to normal. There was no abnormal radiation present during this event. All instruments returned to their correct readings after power was restored to the inverter. 'B' train auxiliary air compressor lost power and the level channel on the volume control tank (VCT) failed causing approximately 400 gallons of water to be pumped from the refueling water storage tank (RWST) to the reactor coolant system (RCS) before it was manually corrected. While the above systems were being corrected, personnel placed the 120 VAC board on the maintenance supply and repaired the inverter by replacing a fuse. The inverter was tested and no other problems could be found.

The second reactor trip occurred on 06/02/84 at 2050C when a manual turbine trip was initiated due to excessive vibration (11 mils) on the number eleven bearing. Sparks were also seen to be coming from the bearing. As before, the rotor and bearing were damaged. Unit 1 was in mode 1 (2235 psig, 568 degrees F) at 75% reactor power just prior to the event. The reactor tripped as expected.

The same thermocouple caused this event also, but this time a ground path from a grounded shield wire to the bearing pedestal existed through where the shield was not insulated. All other equipment and personnel responded and performed as expected during the event. The damaged equipment was repaired and returned to service. However, this thermocouple was removed and a thermocouple already in the bearing oil is being used to monitor bearing temperature. The oil monitoring thermocouple was also moved to the other side of the insulated flange. The reassembly procedure was revised to include more detailed checks of bearing insulation and the wiring for reassembly testing of insulation has been removed. The unit was restarted after all equipment was repaired.

There was no effect on public health or safety, and no safety margins were exceeded. This has been the first reactor trip by interlock from the turbine or manual trip of the turbine for 1984. This has also been the first equipment failure of this type in the plant.

TENNESSEE VALLEY AUTHORITY

Sequoyah Nuclear Plant  
Post Office Box 2000  
Soddy Daisy, Tennessee 37379

June 19, 1984

U.S. Nuclear Regulatory Commission  
Document Control Desk  
Washington, DC 20555

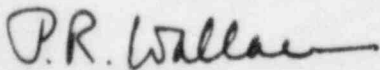
Gentlemen:

TENNESSEE VALLEY AUTHORITY - SEQUOYAH NUCLEAR PLANT UNIT 1 - DOCKET NO.  
50-327 - FACILITY OPERATING LICENSE DPR-77 - REPORTABLE OCCURRENCE REPORT  
SQRO-50-327/84035

The enclosed licensee event report provides details concerning the generator and reactor trip caused by a failed bearing on the generator. This event is reported in accordance with 10 CFR 50.73, paragraph a.2.iv.

Very truly yours,

TENNESSEE VALLEY AUTHORITY



P. R. Wallace  
Plant Manager

Enclosure  
cc (Enclosure):

James P. O'Reilly, Director  
U.S. Nuclear Regulatory Commission  
Suite 2900  
101 Marietta Street, NW  
Atlanta, Georgia 30323

Records Center  
Institute of Nuclear Power Operations  
Suite 1500  
1100 Circle 75 Parkway  
Atlanta, Georgia 30339

NRC Inspector, NUC PR, Sequoyah

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