TENNESSEE VALLEY AUTHORITY

6N 38A Lookout Place
January 22, 1990

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

Gentlemen:

TENNESSEE VALLEY AUTHORITY - SEQUOYAH NUCLEAR PLANT UNIT 1 - DOCKET NO. 50-327 - FACILITY OPERATING LICENSE DPR-77 - LICENSEE EVENT REPORT (LER) 50-327/89036

The enclosed LER provides details of an event wherein the 1B-B diesel generator was inoperable because of a surveillance run time of less than 60 minutes at 4400-kilowatt load. This event is being reported in accordance with 10 CFR 50.73, paragraph a.2.i.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

J. R. Bynum, Vice President
Nuclear Power Production

Enclosure
cc (Enclosure):
Regional Administration
U.S. Nuclear Regulatory Commission
Office of Inspection and Enforcement
Region II
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INPO Records Center
Institute of Nuclear Power Operations
1100 Circle 75 Parkway, Suite 1500
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NRC Resident Inspector
Sequoyah Nuclear Plant
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Soddy Daisy, Tennessee 37379

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NRC FORM 366 (6-89) U.S. NUCLEAR REGULATORY COMMISSION

LICENSEE EVENT REPORT (LER)

APPROVED OMB NO. 3150-0104
EXPIRES: 4/30/92

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Sequoyah Nuclear Plant, Unit 1	0 5 0 0 0 3 2 7	1 OF 0 5

TITLE (4) Diesel Generator Inoperable Because of a Surveillance Run Time Less Than the Required 60 Minutes.

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)
									Sequoyah, Unit 2	0 5 0 0 0 3 2 8
1 2	2 1	8 9	8 9	0 3 6	0 0	0 1	2 2	9 0		0 5 0 0 0

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)	20.405(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 Abstract below and in Text, NRC Form 366A)
		20.405(a)(1)(iii)	XX 50.73(a)(2)(i)	50.73(a)(2)(viii)(A)	
		20.405(a)(1)(iv)	50.73(a)(2)(ii)	50.73(a)(2)(viii)(B)	
		20.405(a)(1)(v)	50.73(a)(2)(iii)	50.73(a)(2)(x)	

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER
	AREA CODE
Geoffrey A. Hipp, Compliance Licensing Engineer	6 1 5 8 4 3 - 7 7 6 6

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)		EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
YES (If yes, complete EXPECTED SUBMISSION DATE)	XX NO				

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

On December 21, 1989, with Unit 1 at 100 percent power and Unit 2 at 75 percent power, it was discovered that surveillance test results that had been used as the basis for declaring the 1B-B diesel generator (D/G) operable following a preventative maintenance (PM) outage, were deficient. The surveillance requirement of Limiting Condition for Operation (LCO) 3.8.1.1 called for at least 60 minutes of D/G operation with a load of 4400 kilowatt (kw) or greater. The D/G had been operated for 63 minutes total but, because of gradual loading, for only 52 minutes with a load of 4400 kw or greater. The D/G was declared inoperable retroactive to the beginning of the PM outage, and the deficient surveillance test was reperformed. Because more than 24 hours had elapsed since the beginning of the D/G PM outage and the remaining D/Gs had not been demonstrated operable in accordance with Surveillance Requirement 4.8.1.1.2.a.4 as required by Action Statement (a) of LCO 3.8.1.1, LCO 3.0.3 was entered until the D/Gs were demonstrated operable. The root cause of this event has been attributed to an inadequate surveillance instruction (SI) that did not clearly exclude gradual loading time from the required 60-minute D/G run time. As corrective action, the SI has been clarified, and the event will be reviewed with shift operations supervisors.

Description of Event

At 1030 Eastern standard time (EST) on December 21, 1989, with Unit 1 in Mode 1 at 100 percent power, 2,235 pounds per square inch gauge (psig), 578 degrees Fahrenheit (F) and Unit 2 in Mode 1 at 75 percent power, 2,235 psig, 570 degrees F, it was discovered that surveillance test results that had been used as the basis for declaring the 1B-B diesel generator (D/G) (EIIS Code EK) operable, were deficient.

The 1B-B D/G was removed from service at 0630 EST on December 20, 1989, for its monthly preventative maintenance (PM) outage. Action (a) of Limiting Condition for Operation (LCO) 3.8.1.1 was entered at that time. This action statement, applicable when either one offsite emergency power circuit or one D/G is inoperable, requires the following actions:

1. Demonstrate the operability of the remaining offsite circuits and D/Gs by verifying correct breaker alignments and indicated power availability within one hour and at least once every eight hours thereafter (Surveillance Requirement [SR] 4.8.1.1.1.a).

2. Demonstrate the operability of the remaining D/Gs within 24 hours by verifying the diesel starts from ambient conditions and accelerates to at least 900 revolutions per minute (rpm) in 10 seconds or less. The generator voltage and frequency shall be 6,900 +/-690 volts and 60 +/- 1.2 hertz (Hz) within 10 seconds after the start signal (SR 4.8.1.1.2.a.4).

3. Restore at least two offsite circuits and four D/Gs to operable status within 72 hours or be in hot standby within the next six hours and in cold shutdown within the following 30 hours.

Requirement No. 1 above is typically satisfied by completion of Data Sheet 7.1.A of Surveillance Instruction (SI) 7.1, "Diesel Generator AC Electrical Power Source Operability Verification (Diesel Generator/Offsite Source)." Similarly, Requirement No. 2 above is typically satisfied by completion of Data Sheet 7.1.B of SI-7.1.

The 1B-B D/G PM outage continued for the rest of December 20, 1989, with periodic performances of SI-7.1, Data Sheet 7.1.A (as required) and culminated with a performance of SI-7, "Electrical Power System: Diesel Generators," completed at 0605 EST on December 21, 1989. SI-7 was performed as a postmaintenance test (PMT) to demonstrate operability prior to returning the D/G to service. One of the SRs satisfied by SI-7 is SR 4.8.1.1.2.a.5 which requires:

*Verifying the generator is synchronized, loaded to greater than or equal to 4400-kw in less than or equal to 60 seconds, and operates for greater than or equal to 60 minutes. . .

*The diesel generator start (10 sec) and load (60 sec) from standby conditions shall be performed at least once per 184 days in these surveillance tests. All other diesel generator engine starts and loading for the purpose of this surveillance testing may be preceded by an engine idle start, followed by gradual acceleration to synchronous speed (900 rpm), synchronization, and gradual loading.

Description of Event (Continued)

The SR requires 60 minutes of operation at 4400 kilowatt (kw) or above when the D/G is loaded within 60 seconds. However, when the D/G is loaded gradually, as permitted by the note, it is open to interpretation whether the 60 minutes of operation the SR requires starts after 4400 kw is loaded or if the 60 minutes includes the gradual loading time. The corresponding section of SI-7 Step 24, which directs the performer to verify the D/G has operated for at least 60 minutes while loaded (finish time minus loading start time must be at least 60 minutes)

During the December 21, 1989, performance of SI-7, the time of initial loading of the 1B-B D/G was 0422 EST, the time a 4400-kw load was reached was 0433 EST, and the test finish time was 0525 EST. The surveillance performer calculated a D/G run time of 63 minutes (0525-0422), which was deemed acceptable. When the SI was completed, the results were reviewed and approved by the shift operations supervisor (SOS). The 1B-B D/G was then declared operable at 0614 EST, and Action (a) of LCO 3.8.1.1 was exited. Because the LCO had not been in effect for 24 hours, it had not been necessary to demonstrate the operability of the other three D/Gs as described previously in Action Statement Requirement (2).

At approximately 1030 EST, while reviewing the completed SI-7 package, the SI review crew noticed that the time the D/G was run with a 4400-kw load was 52 minutes (0525-0433), which was less than the required 60 minutes. The SI review crew brought the discrepancy to the SOS's attention, who consulted with plant management. A conservative decision was made to consider the 0605 EST SI-7 performance to be deficient because the D/G was not run for 60 minutes with a load of at least 4400 kw, even though the testing was probably adequate for the purpose of a PMT. Consequently, the 1B-B D/G was declared inoperable with the time of inoperability defined as 0630 EST on December 20, 1989, because that was when the 1B-B D/G outage started. Because more than 24 hours had elapsed by now and the other three D/Gs had not been demonstrated operable in accordance with SR 4.8.1.1.2.a.4 as required by Action (a) of LCO 3.8.1.1, LCO 3.0.3 was entered as of the time of discovery (1030 EST on December 21, 1989). The other three D/Gs were verified operable at 1230 EST by completing a Data Sheet 7.1.B of SI-7.1 (SR 4.8.1.1.2.a.4) for each. LCO 3.0.3 was exited at that time, and Action (a) of LCO 3.8.1.1 was entered. A repeat performance of SI-7 on the 1B-B D/G was completed at 1642 EST with a run time at 4400-kw load of 73 minutes. The 1B-B D/G was declared operable at 1700 EST, and LCO 3.8.1.1 was exited.

Cause of Event

The root cause of this event has been attributed to an inadequate procedure in that SI-7 did not clearly specify the required 60-minute D/G run time to be with a load of 4400 kw or greater when gradually loaded. A brief summary follows of certain related technical specification (TS) changes to put the event in context.

Cause of Event (Continued)

NRC issued Generic Letter (GL) 84-15, "Proposed Staff Actions to Improve and Maintain Diesel Generator Reliability," on July 2, 1984, to improve D/G reliability by, in part, reducing the number of cold fast start surveillance tests. In response, a TS change was submitted to allow gradual loading for some D/G tests. Previously, the SR allowed only ambient starting and loading to at least 4400 kw within 60 seconds. The TS change was approved in February 1987, and SI-7 was revised to reflect the new requirements. The wording adopted by these changes is essentially the wording that existed at the time of this event. The SQN TS wording is very slightly different from the typical TS provided as an example in the GL 84-15 letter. The example TS redundantly states the requirement as: loading to 4400 kw or greater and operation at 4400 kw or greater for at least 60 minutes. The SQN TS require loading to 4400 kw or greater and operation for at least 60 minutes. This wording, in combination with the related note allowing gradual loading, allows room for interpretation whether the gradual loading time can be included in the 60 minutes. This potential for ambiguity was carried over into the implementing procedure, SI-7, when it was revised in 1987.

Analysis of Event

This event is being reported in accordance with 10 CFR 50.73, paragraph a.2.i, as an operation prohibited by TS, in that the three unaffected D/Gs were not demonstrated operable in accordance with SR 4.8.1.1.2.a.4 with 24 hours as required by Action Statement (a) of LCO 3.8.1.1.

The standby alternating current (ac) power system is described in Section 8.3.1.1 of the SQN Updated Final Safety Analysis Report. This system continuously supplies power for energizing all ac-powered electrical devices essential to safety. The D/Gs are the standby power source for this system.

Operation of the 1B-B D/G for 52 minutes instead of the required 60 minutes at 4400 kw or greater during the 0605 EST SI-7 performance, was a deficiency in the D/G PMT, but did not result in any loss of D/G functional capability. The 52 minutes versus 60 minutes was probably insignificant for the purpose of PMT, but the 1B-B D/G was technically inoperable. The reperformance of SI-7 completed at 1642 EST demonstrated that the D/G was capable of operating under continuous load for greater than 60 minutes. Therefore, if the 1B-B D/G had been called upon to perform any time after 0630 EST on December 21, 1989, its safety function would have been performed as expected. Consequently, at no time were plant safety features compromised, nor did this event result in any increased risk to the health and safety of plant personnel or the general public.

Corrective Actions

The immediate corrective actions, upon discovery of the event, were to declare the 1B-B D/G inoperable, verify the other three D/Gs operable in accordance with SR 4.8.1.1.2.a.4, and reperform SI-7 on the 1B-B D/G with a run time of more than 60 minutes at a load of 4400 kw or greater. The D/G was then returned to service. A procedure change was immediately initiated to clarify SI-7 to require operation with a load of 4400 kw or greater for at least 60 minutes to satisfy acceptance criteria. This procedure change was put in effect on December 22, 1989. Additionally, the Operations Superintendent will discuss this event in his next monthly SOS meeting.

The last performances of SI-7 on 1A-A, 2A-A, and 2B-B D/Gs have been reviewed to verify operability of those units. Run times at 4400 kw or greater were 69 minutes, 64 minutes, and 68 minutes, respectively. A review of previous SI-7 performances conducted since the Unit 2 Cycle 3 outage in May 1989 has revealed two other occurrences (on August 3, 1989, and August 10, 1989) where a D/G was operated for less than the required 60 minutes with 4400-kw load.

Additional Information

There have been 17 LERs previously written as a result of SIs not ensuring compliance with TSs--SQN-50-327/86007, 86013, 86028, 86030, 86035, 86039, 86040, 86042, 86044, 86050, 87002, 87007, 87008, 87009, 89025, SQN-50-328/86006, and 86007. The vast majority of these LERs were written as the result of SQN's SI Review Program. None of the previous LERs were connected with SI-7 or SI-7.1 surveillance of D/Gs. As previously described, the deficiency in SI-7 was a potential for misinterpretation as opposed to an easily identifiable procedural deficiency or omission.

Commitment

The Operations Superintendent will discuss this event in his next monthly SOS meeting.

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