

Tennessee Valley Authority, Post Office Box 2000, Soddy-Daisy, Tennessee 37379-2000

R.J. Adney  
Site Vice President  
Sequoyah Nuclear Plant

May 6, 1997

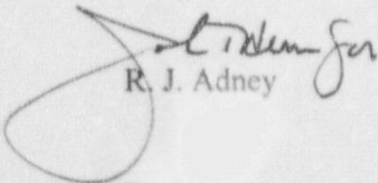
U.S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Washington, D.C. 20555

Gentlemen:

TENNESSEE VALLEY AUTHORITY - SEQUOYAH NUCLEAR PLANT (SQN)  
UNITS 2 - DOCKET NO. 50-328 - FACILITY OPERATING LICENSES DPR-79 -  
LICENSEE EVENT REPORT (LER) 50-328/97002

The enclosed report provides details concerning the failure to properly maintain two independent offsite power supplies as required by technical specifications. This condition is being reported in accordance with 10 CFR 50.73(a)(2)(i)(P) - an operation prohibited by the plant's technical specifications.

Sincerely,

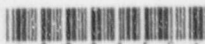
  
R. J. Adney

Enclosure

cc: See page 2

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U.S. Nuclear Regulatory Commission

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Enclosure

cc (Enclosure):

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## LICENSEE EVENT REPORT (LER)

(See reverse for required number of  
digits/characters for each block)ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS  
MANDATORY INFORMATION COLLECTION REQUEST: 50.0  
HRS. REPORTED LESSONS LEARNED ARE INCORPORATED  
INTO THE LICENSING PROCESS AND FED BACK TO INDUSTRY.  
FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO  
THE INFORMATION AND RECORDS MANAGEMENT BRANCH (T-  
6 F33), U.S. NUCLEAR REGULATORY COMMISSION,  
WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK

FACILITY NAME (1)

Sequoyah Nuclear Plant (SQN) Unit 2

DOCKET NUMBER (2)

05000328

PAGE (3)

1 OF 6

TITLE (4)

Failure to Maintain Two Offsite Power Sources as Required by Technical Specifications.

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
04	01	97	97	-- 009	-- 00	05	06	97	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)		<input checked="" type="checkbox"/>		50.73(a)(2)(ii)	50.73(a)(2)(viii)
			20.2203(a)(1)		20.2203(a)(3)(i)				50.73(a)(2)(iii)	50.73(a)(2)(x)
			20.2203(a)(2)(i)		20.2203(a)(3)(iii)				50.73(a)(2)(iii)	73.71
			20.2203(a)(2)(ii)		20.2203(a)(4)				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

J. W. Proffitt, Licensing Engineer

TELEPHONE NUMBER (Include Area Code)

(423) 843-6651

## 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).

X

NO

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

On April 6, 1997, it was determined that a problem existed with Start Bus 1A alternate feeder breaker. The breaker was removed from service and the normal feeder breaker was placed in service. The breaker was inspected and it was determined that the main contact compression was out of tolerance and a gap of the main contacts caused minor arcing and burning of the arcing contacts. The breaker was determined to be inoperable since April 1, 1997, when it had been placed in service. The cause was determined to be the inadequate refurbishment of quality-related breakers by Asea Brown Boveri (ABB). Installation of ABB refurbished breakers was suspended. Main contact compression checks on two ABB breakers that had been recently refurbished were performed and were determined to be satisfactory. An inspection of the refurbished breakers currently installed on Start Bus 1A was performed, no refurbished breakers are currently installed on Start Bus 1A. An evaluation of the refurbished breakers that are in service was performed. The breakers were determined to be functioning properly. Increased inspection requirements for refurbished breakers has been defined and incorporated into plant procedures. Appropriate procedures have been revised to include post maintenance testing requirements to ensure that breakers function properly following installation.

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SQN Unit 2	05000328	YEAR 97 --	SEQUENTIAL NUMBER 002 --	REVISION NUMBER 00	2 of 6

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

**I. PLANT CONDITIONS**

Unit 2 was in Mode 1 at approximately 100 percent power.

**II. DESCRIPTION OF EVENT**

**A. Event:**

On April 1, 1997 Start Bus 1A alternate feeder breaker [EIS Code FK] was placed in service. On April 6, 1997, it was determined that a problem existed with Start Bus 1A alternate feeder breaker. The breaker was removed from service and the normal feeder breaker was placed in service. The breaker was inspected. Evidence of minor arcing, pitting and burnt surfaces on the 'B' and 'C' phase arcing contacts were observed. On April 7 it was determined that the main contact compression was out of tolerance and a gap of the main contacts caused the minor arcing and burning of the arcing contacts. Technical specifications require two physically independent circuits between the offsite transmission network and the onsite Class IE distribution system and four separate and independent diesel generator (D/G) [EIS Code EK] sets to be operable. With one offsite power circuit inoperable technical specifications require the circuit to be restored to operable status within 72 hours. It has been determined that during the period of April 1-6, only one offsite power circuit was considered operable. Therefore, SQN did not comply with limiting condition for operation (LCO) 3.8.1.1 action (a).

On April 2, 1997, at 1126 Eastern Standard Time (EST), D/G 1B-B was declared inoperable. With one offsite power circuit and one D/G set inoperable technical specifications require one of the inoperable sources to be restored within 12 hours. D/G 1B-B was returned operable on April 5, 1997, at 0310 EST. Therefore, SQN did not comply with LCO 3.8.1.1 action (c).

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

None.

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

**C. Dates and Approximate Times of Major Occurrences:**

- March 23, 1997 ABB, type 15HK circuit breaker, was obtained for placing into service as the alternate feeder breaker on Start Bus 1A. The breaker had been refurbished by ABB.
- March 24, 1997 Electrical Maintenance performed initial opening and closing response time testing and adjustments of the breaker in accordance with plant procedures.
- April 1, 1997 The refurbished breaker was placed in service as the alternate  
2150 EST feeder breaker on Start Bus 1A.
- April 2, 1997 D/G 1B-B was declared inoperable as a result of a phase  
1126 EST imbalance.
- April 5, 1997 No problem with D/G 1B-B could be identified. The D/G  
0310 EST was tested and declared operable.
- April 6, 1997 The power supply voltage to the main transformer insulating  
at 0923 Eastern oil processing system was observed to be abnormal. Operator  
Daylight Time observation of other voltage indicating meters indicated that a  
(EDT) problem existed with the power supply voltage in the plant.
- April 6, 1997 Start Bus 1A alternate feeder breaker was observed to have  
at 1037 EDT audible arcing noise.
- April 6, 1997 Start Bus 1A alternate feeder breaker was removed from  
1122 EDT service and the normal feeder breaker was placed in service.
- April 7, 1997 It was determined that the main contact compression was out of  
tolerance and a gap of the main contacts caused the arcing and  
burning of the arcing contacts.

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

**C. Contributing Factors**

Contributing to the identified condition was the inadequate refurbishment of quality-related breakers by ABB.

**IV. ANALYSIS OF THE EVENT**

During the period, April 1-6, that the alternate feeder breaker was in service, one of the two physically independent circuits between the offsite transmission network and the onsite Class IE distribution system was operable. The normal feeder breaker was available to provide an additional source of offsite power with manual operator action to transfer the power supply from the alternate feeder breaker to the normal feeder breaker. Also, during this period, at least one train of onsite power was operable. With the core empty on Unit 1 and Unit 2 at 100 percent power, sufficient power sources were available to ensure electrical availability to safely shut down and maintain the plant during a design basis event. Therefore, the condition did not adversely affect the health or safety of plant personnel or the general public.

**V. CORRECTIVE ACTIONS**

**A. Immediate Corrective Actions:**

Upon determination of the condition, Operations transferred Start Bus 1A to the normal feeder breaker and removed the alternate feeder breaker from service.

Installation of refurbished ABB breakers was suspended. It was determined that six recently refurbished breakers had been installed in the plant (including the alternate feeder breaker). Main contact compression checks were performed on two ABB breakers that were out of service. The main contact compression was determined to be satisfactory. An inspection of the refurbished breakers currently installed on Start Buses 1A has been performed. An evaluation of the refurbished breakers that are in service on Start Buses 2A and 2B was performed. The evaluation concluded that the breakers are functioning properly. A refurbished breaker is not currently installed on Start Bus 1B.

An inspection of the 1A Start Bus alternate feeder breaker cubicle was performed; no damage to the compartment was identified.

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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 condition was identified when inadequate power supply voltage to the main transformer insulating oil processing system was observed. Operations was notified of the condition.

**F. Operator Actions:**

Main Control room personnel observed other indicating meters and concluded that a problem existed with the power supply voltage in the plant. An operator was dispatched to investigate the potential problem. The operator observed the Start Bus 1A alternate feeder breaker to have an audible arcing noise. Operations transferred Start Bus 1A to the normal feeder breaker and removed the alternate feeder breaker from service.

**G. Safety System Responses:**

No safety system responses were required.

**III. CAUSE OF THE EVENT**

**A. Immediate Cause:**

The immediate cause of the condition was determined to be that the main contact compression was out of tolerance resulting in a failure of the breaker.

**B. Root Cause:**

The root cause was determined to be the acceptance of a refurbishment of quality-related breakers under a vendor's commercial-grade program without an adequate technical analysis and specification of inspection / testing requirements to ensure that the breakers would function properly.

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An evaluation of the 480 volt loads being supplied power from Start Bus 1A was performed. The evaluation concluded that the loads were not damaged by the low voltage condition present. A bridge and megger test on a 480-volt motor powered from the 1A Start Bus was performed, no damage was identified.

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

Increased inspection requirements for refurbished breakers has been defined and incorporated into plant procedures. Appropriate procedures have been revised to include post maintenance test requirements to ensure that 6900-volt breakers function properly following installation.

An assessment of the procurement of quality-related services and the understanding of the process by site personnel is being performed. The preliminary results indicate the process is adequate but may not be well understood by site personnel. The results of the assessment will be evaluated and appropriate corrective actions established in accordance with the corrective action program.

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

ABB type 15HK 6900-volt circuit breaker, Serial Number 54801A-1-01766.

**B. Previous LERs on Similar Events:**

There were no previous similar events identified.

**C. Additional Information:**

None.

**VII. COMMITMENTS**

None.