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Robert A. Fenech
Vice President, Sequoyah Nuclear Plant

September 20, 1993

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

Gentlemen:

TENNISSEE VALLEY AUTHORITY - SEQUOYAH NUCLEAR PLANT UNITS 1 AND 2 -
DOCKET NOS. 50-327 AND 50-328 - FACILITY OPERATING LICENSES DPR-77 AND
DPR-79 - LICENSEE EVENT REPORT (LER) 50-327/93023

The enclosed LER provides details concerning a degradation of fire doors and impairment of these doors for a period greater than the technical specification (TS) allowable timeframe as a result of incorrect door-hinge material.

This event is being reported in accordance with 10 CFR 50.73(a)(2)(i) as a condition resulting in operation prohibited by TSs. Additionally, this report satisfies the special report requirements of TS 3.7.12 Action Statement (a).

Sincerely,

Robert A. Fenech

Enclosure
cc: See page 2

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cc (Enclosure):

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LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Sequoyah Nuclear Plant (SON), Unit 1 DOCKET NUMBER (2) PAGE (3)
050003 12 17 11 OF 05
TITLE (4)

Degradation of Fire Doors as a Result of Incorrect Door Hinge Material

EVENT DAY (5) LER NUMBER (6) REPORT DATE (7) OTHER FACILITIES INVOLVED (8)
MONTH DAY YEAR YEAR SEQUENTIAL REVISION FACILITY NAMES DOCKET NUMBER(S)
NUMBER NUMBER MONTH DAY YEAR Sequoyah, Unit 2 050003 12 18
08 19 93 02 3 00 09 20 93 050003

OPERATING MODE THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5:

(Check one or more of the following)(11)

(9)	6	20.402(b)	20.405(c)	50.73(a)(2)(iv)	73.71(b)
POWER		20.405(a)(1)(i)	50.36(c)(1)	50.73(a)(2)(v)	73.71(c)
LEVEL		20.405(a)(1)(ii)	50.36(c)(2)	50.73(a)(2)(vii)	OTHER (Specify in
(10)	10 10 10	20.405(a)(1)(iii)	XX 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
AREA CODE
J. Bajraszewski, Compliance Licensing 615 843 - 7749

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

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

On August 21, 1993, with Unit 1 in Mode 6 (refueling) and Unit 2 in Mode 5 (cold shutdown), it was determined that various fire doors in the plant were installed with hinges that do not meet the National Fire Protection Association 80 requirements. Some hinges on approximately 100 fire doors were found to be fabricated from brass, bronze, or stainless steel, and not carbon steel. The condition was discovered during a fire door configuration verification where fire door, frame, and hardware inspections were being performed. Impairment permits were prepared for the affected fire doors, and appropriate compensatory action was taken. The condition was caused by insufficient information contained on the drawings that were used in the original construction procurement specification, resulting in procurement of nonsteel hinges. Work documents have been initiated, and the replacement of brass or bronze hinges is in progress. This report satisfies the special report requirements of Technical Specification 3.7.12 Action Statement (a).

LICENSEE EVENT REPORT (LER)

TEXT CONTINUATION

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		SEQUENTIAL		REVISION																
		YEAR	NUMBER	NUMBER	NUMBER	NUMBER	NUMBER													
Sequoyah Nuclear Plant (SQN), Unit 1		05	00	03	12	17	19	13	--	0	2	3	--	0	0	0	2	OF	0	5

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

I. PLANT CONDITIONS

Unit 1 was in Mode 6 (refueling) and Unit 2 was in Mode 5 (cold shutdown).

II. DESCRIPTION OF EVENT

A. Event

On August 21, 1993, at 1900 Eastern daylight time (EDT), it was determined that various fire doors (EIS Code DR) in the plant were installed with some hinges that do not meet the National Fire Protection Association (NFPA) 80 requirements. The condition was discovered during a fire door configuration verification where fire door, frame, and hardware inspections were being performed. Hinges were being checked by magnetic attraction to verify that the hinge material was carbon steel. The base material of hinges that had no magnetic attraction was verified by lightly filing the hinge knuckle. Hinges showing a yellow base metal were determined to be fabricated from brass or bronze. This report satisfies the special report requirements of Technical Specification (TS) 3.7.12 Action Statement (a).

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

None.

C. Dates and Approximate Times of Major Occurrences

1. 1972
The procurement specification was issued for door hardware (including hinges). The specified hinge type was available in either brass/bronze or stainless steel under the same product part number. The specification did not identify the specific material type.
2. 1977
A fire protection program reevaluation was completed. An engineering change notice was issued for plant compartmentation. A new drawing and procurement specification were issued; wrought steel hinges were specified. The previous hardware was reused except for new locations.
3. August 3, 1993
During fire door hardware inspection, the magnet being used for verification of steel hinges slipped from the hinge knuckle onto the hinge plate and magnetic attraction did not occur. Further examination showed that the magnet was attracted to the steel components in the hinge knuckle. The inspection location was changed to the hinge plate and reinspection of the fire door hinges was initiated.

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4. August 10, 1993 The fire door hinge inspection was completed. Approximately 100 fire doors had some hinges that could not be verified as carbon steel. A procurement contract review and development of an action plan were initiated for determination of hinge material for those hinges where magnetic attraction did not occur.
5. August 19, 1993 After it was determined that brass or bronze hinges were at 1900 EDT installed in some locations, applicable compensatory measures (fire watches) were put in place. TS Limiting Condition for Operation (LCO) 3.7.12 was entered.
6. August 21, 1993 Work documents were written to evaluate the hinge base material and for replacement of hinges verified to be brass or bronze. The base material verification was accomplished by lightly filing the hinge knuckle satin chrome finish. A yellow base metal indicated the hinge to be either brass or bronze.
7. August 26, 1993 The replacement of nonsteel hinges began.

D. Other Systems or Secondary Functions Affected

None.

E. Method of Discovery

The condition was discovered during a fire door configuration verification where fire door, frame, and hardware inspections were being performed. Hinges were being checked by magnetic attraction to verify that the hinge material was carbon steel. The base material of hinges that had no magnetic attraction were verified by lightly filing the hinge knuckle. A yellow base metal indicated the hinge to be either brass or bronze.

F. Operator Actions

Operations entered the required LCO and implemented the appropriate compensatory measures.

G. Safety System Response

No safety system response occurred or was required.

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

III. CAUSE OF EVENT

A. Immediate Cause

The immediate cause of the condition is the use of fire door hinges that are fabricated from brass or bronze material.

B. Root Cause

The root cause of the condition was insufficient information contained on the drawings that were used in the original construction procurement specification. The procurement specification utilized approximately 20 architectural drawings to identify door hardware requirements (including hinges) for both fire and nonfire doors. These drawings specified a door hinge type that is available in plated brass/bronze or stainless steel under the same product part number. The drawings did not identify the specific material type required for use on fire doors. This resulted in the procurement, receipt, and installation of the plated brass or bronze hinges.

C. Contributing Factors

None.

IV. ANALYSIS OF EVENT

Fire doors serve as fire barriers. The functional integrity of the fire barrier ensures that fires will be confined or adequately retarded from spreading to adjacent portions of the facility. Confirmation that various fire doors were installed with nonsteel hinges places the fire doors in a degraded condition. The melting point of nonsteel hinges is between 1,650 degrees Fahrenheit (F) (brass) and 1,900 degrees F (bronze). Underwriters laboratories testing exposes the fire door assembly to 1,000 degrees F within the first five minutes and gradually increases the fire temperature to 1,900 degrees F at three hours. Even though the presence of the nonsteel hinges voided the full fire rating of the door assemblies, the door assemblies did retain some functional capabilities in that they would remain in place for a period of time during a fire. In the event of a fire, fire detection and/or compensatory fire watches would have provided early warning. Automatic or manual fire suppression capabilities would have been available to mitigate the consequences of the fire. Therefore, plant safety was not adversely affected by the condition.

V. CORRECTIVE ACTION

A. Immediate Corrective Action

Work documents were prepared and replacement of nonsteel hinges has been initiated.

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		YEAR	NUMBER

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

B. Corrective Action to Prevent Recurrence

The architectural door drawings will be revised to clearly define hinge requirements for fire doors.

During review of the condition, a problem was not found with either the design or procurement processes. The current design process contains reviews and evaluations that did not exist during the construction period. These additional controls ensure proper material identification and procurement.

VI. ADDITIONAL INFORMATION

A. Failed Components

None.

B. Previous Similar Events

None.

VII. COMMITMENT

The architectural door drawings will be revised by December 29, 1993, to clearly define hinge requirements for fire doors.