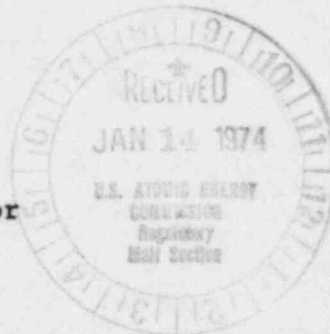


TENNESSEE VALLEY AUTHORITY
CHATTANOOGA, TENNESSEE
37401



Mr. Voss A. Moore, Assistant Director
for Boiling Water Reactors
Directorate of Licensing
Office of Regulations
U.S. Atomic Energy Commission
Washington, DC 20545

Dear Mr. Moore:

In the Matter of the Applications of) Docket Nos. 50-259
of Tennessee Valley Authority) 50-260
50-296

In a telephone conversation on January 3, 1974, F. J. Williams of your staff notified us that the responsibility for the Browns Ferry Nuclear Plant torus problem had been transferred from the Directorate of Regulatory Operations to the Directorate of Licensing. Further, he asked that a call be arranged whereby he could obtain more information about the problem. Consequently, on January 4, 1974, a telephone conversation was held among J. F. Stolz and F. J. Williams of your staff and R. H. Davidson, R. C. Steffy, C. O. Thomas, and W. L. Byrd of our Nuclear Engineering Branch. During that conversation, R. H. Davidson described the history and present status of the problem and steps being taken to alleviate the problem. This letter is in response to J. F. Stolz's request that we document for you the most essential elements of that conversation.

A drawing of the torus and torus ring header is presented as Enclosure 1. The torus ring header is 30 inches in diameter and circumscribes the torus at elevation 525 feet 4 inches. Four 30-inch penetration nozzels connect the ring header to the torus. The ring header is now supported by brackets attached to the 16 cradles as shown in Enclosure 2.

The details concerning the vibrations observed in the torus and torus ring header upon the opening of relief valves during startup testing at unit 1 of the Browns Ferry Nuclear Plant are described

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inquiry

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COPY SENT REGION *IV*

Voss A. Moore

in a letter dated November 28, 1973, from E. F. Thomas to J. F. O'Leary enclosing Abnormal Occurrence Report BFAO-7343W. An interim report on the testing and work performed to alleviate the problem as of December 17, 1973, was provided in a letter bearing that date from E. F. Thomas to J. F. O'Leary.

Subsequent to December 17, 1973, the torus was raised and stainless steel shims were placed between most of the torus feet and base plates to equalize more nearly the load on each of the feet. Also, the three relief valve tail pipes with ram's head terminations were shortened to approximately four feet from the bottom of the torus shell. Vibration and stress measuring instrumentation was installed.

Test plans and acceptance criteria were developed jointly by GE and TVA, and a gradual sequence of tests is now underway to determine the effectiveness of the modifications.

TVA's Nuclear Safety Review Board has reviewed the test plans and acceptance criteria and, based on the limiting conditions and power level restrictions specified in the test procedure, agreed that the tests could be conducted safely. It also has been determined that the written instructions and available systems would assure that the reactor could be shut down and maintained in a safe shutdown condition at any time during the tests. A detailed report will be provided upon completion of the testing program.

Very truly yours,

J. E. Gilleland
Assistant to the Manager of Power

Enclosures

CC (Enclosures):

Mr. R. R. Barris
General Electric Company
832 Georgia Avenue
Chattanooga, TN 37402

Mr. K. L. Sessions
General Electric Company
9040 Executive Park Drive
Knoxville, TN 37919

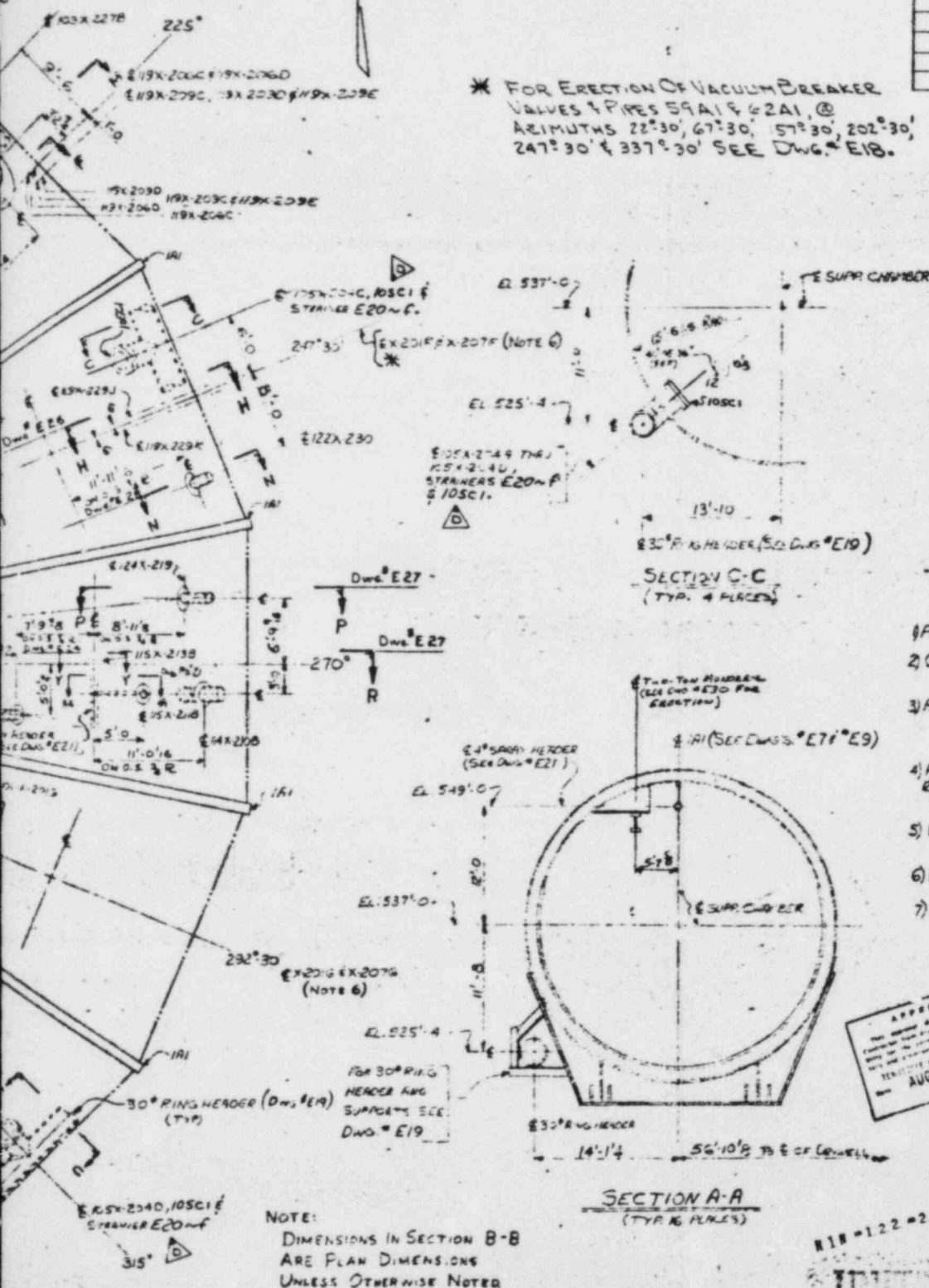
Mr. R. E. Beers
TVA Projects
General Electric Company
Atomic Power Equipment Department
San Jose, California 95125



MATERIAL BILL							
QTY OF SHP. PLS.	NAME	NO. OF PLS.	DESCRIPTION FINISHED SIZE	LENGTH		A.S. NO B LINE	TYPE OF MAT.
				FT.	IN.		
							1
							2
							3
							4
							5
							6
							7
							8
							9
							10

* FOR ERECTION OF VACUUM BREAKER
VALVES & PIPES 59A1 & 62A1, @
AZIMUTHS 22°30', 67°30', 157°30', 202°30',
247°30' & 337°30' SEE DWG. E18.

ENCLOSURE 1



GENERAL NOTES

- 1) PARTS SHOWN IN PHANTOM PER DWG'S. *E3, E4, ES.
- 2) CLEAN & PAINT PER SECTION 3.0 OF
PAINT LETTER PI, LATEST REVISION
- 3) ALL ELECTRODES E7018 OR EQUAL. USE
ONLY ELECTRODES ORDERED &
CERTIFIED FOR THIS CONTRACT.
- 4) FOR LOCATION OF BEAM SEATS 120P1, 120P2,
80P3, 120P3A & 120P4 (AT EL 561'04") SEE
DWG. *E22.
- 5) WORK THIS DWG. WITH DWG'S. *E3, E4, ES, E7
E9 & E16 T.H.U. E'30.
- 6) PL. MARKS AS NOTED ARE FOR G.E. REF. ONLY.
- 7) ALL WELDING TO BE DONE IN ACCORDANCE
WITH DB119-144 & WELD QUALIFICATION
PROCEDURE. TENNESSEE VALLEY AUTHORITY

TENNESSEE VALLEY AUTHORITY
 DIVISION OF DESIGN
 KNOXVILLE, TENNESSEE
 AUG 7 1968
 PROJECT: BRIDGES PERMANENTLY
 FOR CONTRACT NO. ENEC-10-700-100
 TITLE: MAJOR EQUIPMENT PACKAGE
 USE
 CHECKED
 11-11-70

WELD SPECIFICATION
1945 ASME CODE SECT III.
S.E. SECT B 1 SECT PARA 4.1.1
FULL BUTT WELDS.

CERTIFIED
BY _____
FOR _____

APPROVED
BY *[Signature]*
DATE *6/28/68*

WALTER J. HARRINGTON
MANAGER, WELDING DEPARTMENT
GENERAL ELECTRIC CO.

CROWN'S FERRY 1
GENERAL ELECTRIC CO.
APR - SAN JOSE

9-34-327-4
16-11

PITTSBURGH-DES MOINES STEEL CO.
ENGINEERS-FABRICATORS-CONTRACTORS

TYA CONTINUITY NOTES

[illegible]

INVESTIGATION OF THE
(1st & 2nd QUARTER) PENETRATION EJECTION

ENG. PREPARED AT FSM

FABRICATED AT _____

BY	DO
P. P.	10-1

DRAYTH 22 1954
CHECKED 22 1954

Checked	7/1/19
---------	--------

DRAWING NO. 515

CONTRACT NO. 17201

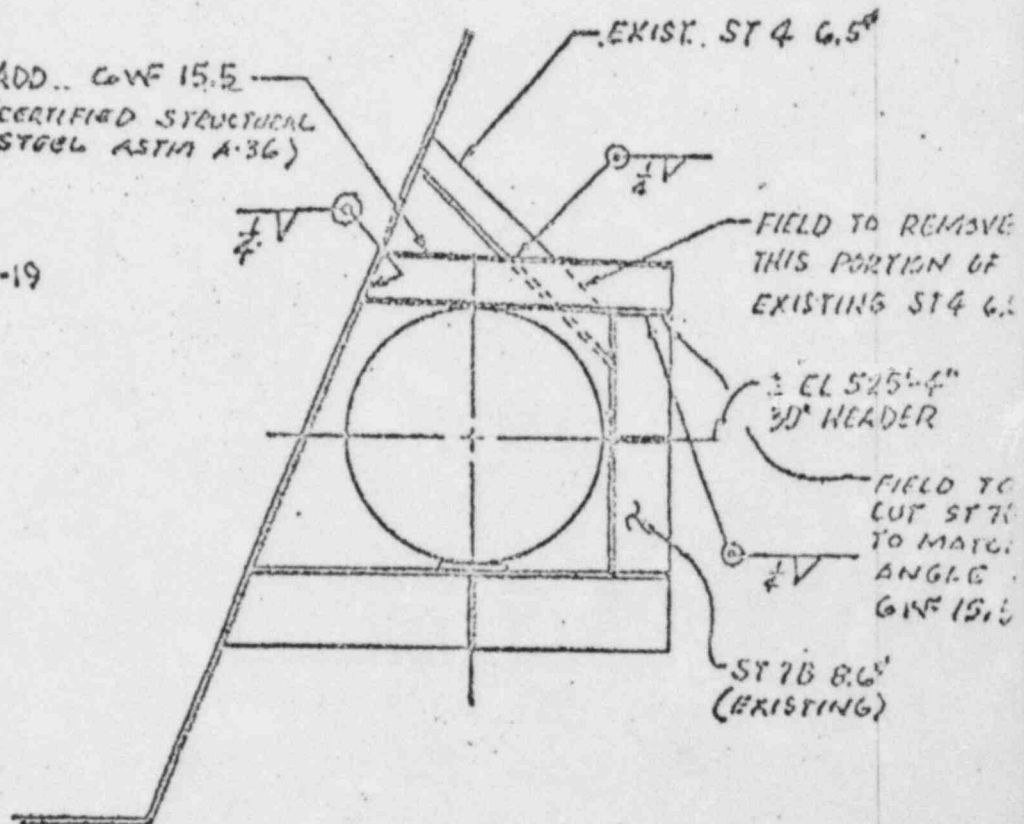
5. E. & Q. A. P. F. 12-16-11

(10) 100

NOTE 6) *

NOTE: TAKEN FROM
PDM DWG E-19

ADD.. GWF 15.5
(CERTIFIED STRUCTURAL
STEEL ASTM A-36)



SECT THRU PSC RING HDR - SUPPORT DETAIL

TYP 16 PLACES

TRANSFER OF LEAD RESPONSIBILITY

Date: DEC 28 1973

Serial No.: RO-C&O-73-21

To: Voss A. Moore, Assistant Director for Boiling Water Reactors, L

Subject: Vibrations in the Torus and Torus-Ring Header During Relief Valve Operation

Facility: Tennessee Valley Authority, Browns Ferry Nuclear Plant Units 1, 2 and 3

Responsible RO Assistant Director: B. H. Grier

Description of Item Requiring Resolution:

During testing of relief valves at the Browns Ferry 1 facility, vibrations were noted in the vicinity of the torus. As a result, special instrumentation was installed to measure the acceleration and deflection of the torus walls and torus-ring header. The licensee characterized the measured data as "more than desirable, but within the range predicted by General Electric Company." TVA has calculated critical stress points on the torus and concluded that the stresses occurring during relief valve operation are within the allowable range. However, the licensee has stated a concern for the long-term fatigue effects on the torus wall.

TVA and other licensees have recently made modifications to their Target Rock relief valves to increase the opening response time. This is of possible significance, in that General Electric has shown during studies made on Quad Cities 1 torus (Reference 3) that more rapid opening times for these valves result in higher transient pressures at their point of discharge into the torus.

References:

1. TVA - Browns Ferry 1, Abnormal Occurrence Reports BFAO 7343W dated November 28, 1973 and Interim Report dated December 16, 1973.
2. Transfer of Lead Responsibility No. RO-C&O-8, dated October 18, 1973, Target Rock Safety Relief Valves.
3. NEDO 10859, Steam Vent Clearing Phenomena and Structural Response of the BWR Torus.

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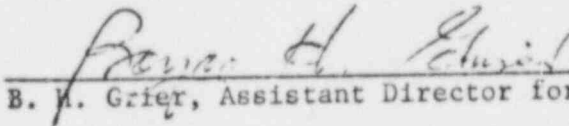
DEC 28 1973

RO Recommendations and Proposed Course of Action:

It is recommended that the Directorate of Licensing take the lead responsibility in reviewing the safety aspects of this matter.

Concurrences:

Voss A. Moore, Assistant Director for Boiling Water Reactors, L

12/27/73
Date

B. H. Grier, Assistant Director for Construction & Operation, RO

12/27/73
Date

cc: D. F. Knuth, RO
A. Giambusso, L
J. G. Davis, RO
J. M. Hendrie, L
D. J. Skovholt, L
J. B. Henderson, RO
G. W. Reinmuth, RO
R. J. McDermott, RO
H. D. Thornburg, RO
N. C. Moseley, RO:II