

Steven A. Varga, Chief

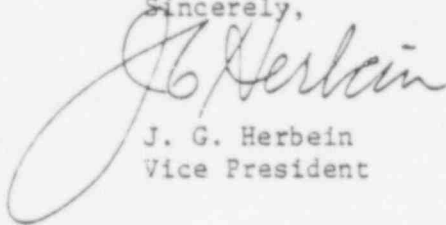
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November 22, 1977
GOL 1632

4. "OTSG Enclosure Can Analysis".

Members of my staff will be happy to discuss any questions concerning this installation at any time.

Sincerely,



J. G. Herbein
Vice President

JGH:JRS:gs

Attachment: Safety Evaluation of OTSG
Instrumentation Program

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SAFETY EVALUATION
of
OTSG Instrumentation Program

Three Mile Island Unit No. 2

November 1977

SAFETY EVALUATION

1. INTRODUCTION

1.1. Project Genesis

On August 12, 1977, B&W submitted a proposal for a vibration measurement program on an OTSG for TMI-2 to General Public Utility Service Corporation (GPUSC).

In the measurement proposal, B&W recommended that preparations be made for implementing an OTSG vibration measurement instrumentation program at TMI-2. The measurement proposal recommended biaxial accelerometers be installed. Also, a parallel strain gauge development and verification program was proposed to provide a direct measure of tube strain. If acceptable strain gauge reliability is demonstrated, then the tube instrumentation scope is to be modified to include the capability for direct measuring and recording of tube strains. The accelerometer instrumentation program as well as the strain gauge development and verification program is contained herein.

1.2. Purpose

The purpose of the measurement program to be conducted on the "B" OTSG at TMI-2 is to provide tube response flow data and plant process data. These data are to be used to evaluate the effect of normal and transient plant operation on the response of tubes in the OTSG.

1.3. Objectives

To meet this purpose, four specific objectives have been defined:

1. To measure the response of on-lane tubes and off-lane tubes at the upper two spans and between the ninth and tenth support plates during normal operating and transient conditions.
2. To measure steam pressures during transients, such as turbine stop valve testing, for correlation with tube response.
3. To measure the system process parameters (including steam flow) during normal and transient conditions for possible correlation with tube response.
4. To relate the vibrational response of tubes to the most plausible steam flow excitation mechanism.

2. SAFETY EVALUATION

A modification of TMI Unit 2 OTSG "B" is required to accommodate the field instrumentation program described in Reference 1. In this regard, all

structural modifications have been constructed* in accordance with an appropriate equipment specification (Reference 2). The requirements of this specification assure that the structural integrity of individual components as well as the total OTSG in its final configuration will be as good as, or better than, that previously described in the FSAR. The detailed stress calculations and associated verifications presented in Reference 3 were performed to show compliance to the equipment specification.

Consideration of the preceding information demonstrates that the structural integrity of the OTSG has not been degraded, and the probability of an accident previously evaluated is not increased. In addition, the probability of an accident occurring which has not been previously evaluated or described in the FSAR, is not increased.

The consequences of an accident can be regarded to be increased by (1) failure of additional structure due to loads induced by the initial accident condition and/or (2) failure of safety related equipment to perform as expected.

With regard to item (1), above, the equipment specification includes consideration of accident induced loads for structures constituting a primary or secondary side pressure retaining boundary. Information presented above provides sufficient assurance that additional structures will not fail and that the consequences of such an accident will not be increased by this mechanism. With regard to item (2), there will be no piece of hardware directly related to safety which will be modified. Neither the structural integrity nor the operational characteristics of any "safety related equipment" is affected.

Field measurement programs at Oconee Nuclear Station Units #1 and #2 were similar in scope and arrangement to the present TMI-2 program. At Oconee #1, thermocouples were installed within OTSG tubes, lead wires run through internal routing hardware on the OTSG upper tubesheet and upper head, and lead wires exited through fittings in the inspection opening cover. This hardware was in the OTSG for one full fuel cycle (April 1973 through October 1974). At Oconee #2, accelerometers were installed within OTSG tubes, lead wires run through internal routing hardware on the OTSG upper tubesheet and upper head, and lead wires exited through fittings in the inspection opening covers. This hardware has been in the OTSG since July 1977.

*The term "construction" as used herein is an all-inclusive term comprising the materials, design, fabrication, examination, testing, installation, and inspection of the subject hardware.

Due to the similarity of this installation to the instrumentation programs at Oconee #1 and #2, as well as the favorable operating experience at Oconee #1 and #2, and the considerations already addressed alone, there is no reduction in the safety margins as defined in the TMI-2 FSA and Technical Specification. Hence, we conclude that there is no undue risk to the health and safety of the public.

REFERENCES:

1. "Field Measurement Test Program of an Once-Through Steam Generator at Three Mile Island Unit 2."
2. Specification 08-1002683, "Steam Generator Instrumentation Hardware", Contract No. 859-2006, General Public Utilities Service Corporation.
3. a) B&W Document No. 33-0202-00, "Stress Report for Instrumentation Program".
b) B&W Document No. 32-4960-00, "OTSG Enclosure Can Analysis".
c) B&W Document No. 32-4961-00, "TMI-2 OTSG Instrumentation Routing Analysis".