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RECIP.NAME RECIPIENT AFFILIATION
TEDESCO,R.L. Assistant Director for Licensing

SUBJECT: Forwards proprietary & nonproprietary versions of Burns & Roe,Inc rept re revised chugging load definition.Revisions reflect 1979 & 1980 steam condensation tests & multivent full-scale test data from JAERI facility in Japan.W/o encls.

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July 22, 1981
G02-81-189

Docket No. 50-397

U. S. Nuclear Regulatory Commission
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RECEIVED
JUL 28 1981
U.S. NUCLEAR REGULATORY COMMISSION

Attention: R. L. Tedesco
Assistant Director for Licensing
Division of Licensing

Gentlemen:

Subject: SUPPLY SYSTEM NUCLEAR PROJECT NO. 2
CHUGGING REPORT - LOAD DEFINITION
AND APPLICATION METHODOLOGY

References: (1) Report, "Chugging Loads - Improved Definition and Application Methodology to Mark II Containments," submitted to NRC June 15, 1979

(2) Letter G02-80-309, GD Bouchey, Supply System, to BJ Youngblood, NRC, dated December 19, 1980

In June 1979, the chugging load definition report identified in Reference (1) was submitted to the NRC for review. This report was based on data obtained from the General Electric Company's 4T test facility during 1975 and 1976. The methodology used in deriving the chugging source load, as presented in Reference (1), accounted for vent acoustics, suppression pool acoustics, and flexibility of pool structural boundaries.

In 1979 and 1980, additional steam condensation tests were performed in the modified 4T test facility. These tests (4TCO tests) provided an additional chugging data base. Evaluation of this 4TCO data base, and of multivent full scale test data from the JAERI Facility in Japan, indicated a need to revise the original chugging load definition provided in Reference (1). On behalf of the Washington Public Power Supply System, Burns and Roe, Inc. has completed its evaluations of this new data base, and has revised the chugging load definition to be used in the assessment of the adequacy of the WNP-2 plant for hydrodynamic loads. This revised load definition is presented in the report forwarded by this letter.

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On January 21, 1981, a meeting was held in Bethesda with the NRC staff and consultants to provide an interim status report on evaluation of the 4TCO test data, and on efforts underway at that time to arrive at a revised chugging load definition. The intent of this presentation was to provide a preliminary indication of conclusions drawn by Burns and Roe resulting from their evaluations of the 4TCO chugging data, and to alert the NRC to the need for an independent review of a modified plant unique chugging load definition, and to the potential need for a review of a plant unique condensation oscillation load definition for WNP-2.

As discussed in this January 21st meeting, and in this report, the revised chugging load definition properly accounts for the physical characteristics of the 4TCO test facility, in a manner similar to that presented in Reference (1). The revised chugging load definition is shown, in the report transmitted with this letter, to conservatively bound the 4TCO, as well as the 4T test data, and incorporates physical realities noted during multivent tests. The predicted WNP-2 suppression pool boundary pressures are shown to compare favorably with measurements in the JAERI test facility. The calculated WNP-2 structural responses are shown to be negligible outside the containment, but of sufficient magnitude inside containment and at the containment shell that they must be considered in design.

As requested by the NRC in the January 21st meeting, we have examined the recently completed Mark II generic chugging load definition for applicability to WNP-2. For the reasons noted in the report, we have concluded the generic chugging load definition cannot be used in its entirety for the WNP-2 plant. However, some features of the generic chugging load definition (averaging procedure for chug strength, desynchronization of chug start times within the pool chug time window, and loading conditions for multivent Mark II geometrics) were incorporated.

With respect to the potential need for a plant-unique condensation oscillation load definition for WNP-2, as indicated in the January 21st meeting and in Reference (2), indications are at the present time that, based on observations of the 4TCO data, these loads should be bounded by the chugging load definition presented in the report transmitted by this letter. Confirmatory studies are proceeding to verify these observations.

The enclosed report presents significant findings relating to hydrodynamic loads on Mark II containments resulting from chugging, and is hereby submitted for NRC review for the WNP-2 plant. Supply System and Burns and Roe personnel will be available to meet with your staff at your convenience to address any questions you may have concerning data evaluation, load definition, application methodology, or any other aspects of the report.

Both proprietary and non-proprietary versions of this report are enclosed. The appropriate documentation required by 10CFR2.790 for the proprietary version is being submitted by Burns and Roe, Incorporated.

Very truly yours,

for G. D. Bouchey
Director, Nuclear Safety

EAF:kjf

Attachment:

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