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SUBJECT: Responds to 870209 telcon re util 870121 request to
 implement ASME Code Case N411 in piping design. Staff agreed
 that Code Case N411 may be implemented if compliance w/
 analysis stipulations of Reg Guide 1.84 satisfied.

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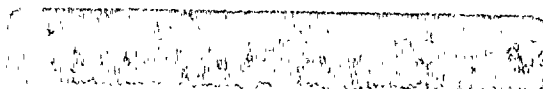
Gentlemen:

Subject: NUCLEAR PLANT NO. 2
OPERATING LICENSE NPF-21
ASME CODE CASE N411, CLARIFICATION OF IMPLEMENTATION

Reference: Letter, G02-87-026, G. C. Sorensen (SS) to NRC,
"Request for ASME Code Case Approval", dated
January 21, 1987

This letter is provided in response to a phone conference held on February 9, 1987, concerning the Supply System's request to implement ASME Code Case N411 in piping design at WNP-2 (see cited Reference). The conference call included J. Bradfute and R. Lee of the NRC Staff, and P. Powell, L. Aeschliman, and D. Bosi of the Supply System.

The Staff agreed that Code Case N411 may be implemented at WNP-2 if compliance with the analysis stipulations of Regulatory Guide 1.84 are satisfied. The Reference discussed in detail the Supply System's program for implementation of the code case including an item-by-item review of the requirements of Regulatory Guide 1.84. The Staff agreed that the proposed analysis program is acceptable, but requested written clarification on two areas of analysis methodology. Specifically, the Staff requires assurance that the code case will not be applied to in-line equipment with a fundamental frequency content less than 20 Hertz, and secondly, that rigid body modes above the cut-off frequency are properly included in the support loads.



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Code Case N411 will not be applied to equipment analyses. In piping analyses where in-line equipment is dynamically active (i.e. 20 Hertz or lower frequencies), a reconciliation of the equipment response to Regulatory Guide 1.61 damping values will be completed. It should be noted that apart from the main recirculation pumps, and extended structure valve operators, no in-line equipment exists in WNP-2 piping anchor groups. Extended structure safety-related valve operators are modeled in the analyses using a detailed "seven member model" and, consequently, accurate frequency results are obtained. Piping attachments to other pumps, the RPV, containment nozzles, and equipment such as heat exchangers are appropriately modeled as anchor points controlled by vendor nozzle allowable load specifications. Inertial and thermal anchor movements are, of course, also imposed at these attachment points.

In response to the Staff's inquiry, WNP-2 modal analyses comply with the modal summation requirements of Regulatory Guide 1.92. Specifically, the SRSS of widely spaced modal responses is used; while for piping systems with closely spaced modes, the grouping method as outlined in Paragraph 1.2.1 of the Regulatory Guide 1.92 is applied. A cut-off frequency of 110 Hertz is used with piping systems subjected to hydrodynamic loads, and for seismic only anchor groups a cut-off frequency of 33 Hertz may be utilized. In these latter analyses, rigid body modes are captured by completing a ZPA analysis (i.e. the zero-period acceleration regime of the spectral input). These ZPA support loads are evaluated to establish the maximum combined support loading.

Since ZPA analysis is only performed to include the effects of high frequency accelerations on the support load, Burns and Roe, Inc. (our Architect/Engineer during construction) performed a study to select a cut-off frequency which would result in an acceptable truncation error for WNP-2 anchor groups. Results of this study showed that when the 110 Hertz cut-off frequency is selected, no ZPA analysis is required. As a result of this study, Burns and Roe conservatively utilized 110 Hertz as the cut-off frequency for all of the hot (i.e. 150°F or greater) safety-related piping located within the Reactor Building, regardless of the applicability of hydrodynamic loading. Since this procedure simplifies the analysis effort, the Supply System conforms to Burns and Roe's practice where applicable.

Although proper combinations of modal responses is important, a credible modal analysis must first be completed. A fundamental requirement in performing a successful modal decomposition is to complete an appropriate mass discretization over the piping anchor group. WNP-2 complies with the Standard Review Plan 3.7.2 requirement which basically stipulates that additional mass lumping would not result in more than a 10% change in system responses. This is accomplished by compliance with the ADLPIPE



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guidelines on inertia point spacing, and additional WNP-2 design guide requirements for placing mass points at direction changes, minimum nodalization requirements between support locations, and mass lumping at flange, or valve, or similar concentrated system weights.

The above discussion formalizes our responses during the subject phone conference of February 9, 1987. The Supply System understands that with submission of the above clarifications, the Staff will have sufficient information to approve the use of ASME Code Case N411 for implementation at WNP-2, including the recommendations of NUREG-1061, as outlined in the Reference letter.

Upon receipt of formal approval, the WNP-2 FSAR will be amended to reflect implementation of the code case in conformance with the requirements of Regulatory Guide 1.84, at the next scheduled annual update.

Should you have any further questions, please contact Mr. P. L. Powell, Manager, WNP-2 Licensing.

Very truly yours,


G. C. Sorensen, Manager
Regulatory Programs

DMB/tmh

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