October 21, 2003

Mr. Richard E. Gimple, Chairman
ASME Subcommittee on Nuclear Inservice Inspection
Post Office Box 411
Burlington, Kansas 66839-0411

Mr. Richard W. Barnes, Chairman
ASME Subcommittee on Nuclear Power
38 Primrose Avenue
Etobicoke, Ontario, Canada, M8V 1P-8

Dear Messrs. Gimple and Barnes:

The purpose of this letter is to direct your attention to the need for a Code position on the acceptability of using a mechanical nozzle seal assembly (MNSA) as a permanent repair for a leaking reactor coolant pressure boundary weld. It is my request that the Code take a formal position on this issue and make it clear to the nuclear industry whether MNSAs would or would not be an appropriate permanent repair and what the post installation inspection requirements would be. It is my hope that this determination can be made and formal Code documentation, e.g., a Code Case, be issued in approximately one year.

The MNSA is a mechanical device that industry is using to provide both sealing and structural integrity for leaking nozzle connections. Currently, MNSAs have been installed on the exterior surfaces of reactor coolant pressure boundary components, as an alternative to weld repairs for leaks in small diameter J-groove welded Alloy 600 instrument nozzles and thermal sleeves. The U.S. Nuclear Regulatory Commission (NRC) has accepted MNSA repairs on a temporary basis for two operating cycles. Such acceptance has necessarily involved Code relief requests because use of MNSAs leaves the flawed J-groove weld in place and unrepaired. Dependent on the edition and addenda of American Society of Mechanical Engineers (ASME) Code Section XI used, Article IWA-4000 requires that existing flaws in ASME Code Class 1 components either be removed in their entirety or, if not removed, evaluated in accordance with the appropriate flaw evaluation provisions of Section XI. In the latter case, however, there are no acceptance criteria for the components and material type in question.

A number of licensees have requested and have been granted NRC approval extending the temporary MNSA repairs beyond the two operating cycles on the same basis as that on which initial approval was granted. However, the NRC has expressed concerns regarding the long term effects of MNSA repairs on the structural integrity of the pressure boundary components on which the repairs have been or would be made, in particular if extensive application of such repairs is implemented on components of the pressure boundary containing a large number of nozzles, such as the bottom heads of pressurizers or reactor vessels. Based on this, the NRC has written to the affected licensees to indicate that the temporary use of MNSAs would not be extended past the current approval period. The licensees will either have to effect a permanent welded repair or provide an acceptable basis for qualifying the currently installed MNSAs as permanent repairs.

It is my understanding that the industry intends to initiate a Code Case addressing the permanent use of MNSAs at the December 2003 ASME Code meeting. NRC staff who regularly participate in Code activities will be involved in the process and will clarify any regulatory concerns. While Section XI does address inservice inspection for Examination Category B-G-2, Pressure Retaining Bolting 2 inches and less in diameter, the associated internal threads and the other parts of this device are not explicitly covered. The conditions under which the MNSA may be accepted as a permanent repair need to be clearly specified. In terms of design, despite the requirements in subparagraph NB-3331(c) of Section III, which states that the requirements of NB-3330 are waived if it is shown by analysis that the basic stress limits of NB-3200 are met, ambiguity remains as a result of the Code's lack of description of acceptable mechanical joint geometries and size limitations that may be installed, paralleling the clearly described welded joint geometries in NB-3352.4. We are aware of two Code Interpretations: the second one, an October 15, 2001, letter from Christian Sanna to William C. Holston (NI01-007), indicates that the waiver in NB-3331(c) includes the requirements for Attachment of Nozzles and Other Connections Under NB-3337; the first interpretation, a September 16, 1997 letter from Joseph M. Saltarelli to Owen F. Hedden (NI97-015), merely states that a bolted connection designed in accordance with NB-3200 is acceptable for connecting external piping to a vessel. The need for two interpretations addressing the same issue is illustrative of the lack of clarity of the Section III rules in this regard.

The Code is the proper forum for addressing the technical concerns in use of MNSAs as a repair method. Since there are currently no Code provisions that address the use of MNSAs, licensees likely will continue to seek NRC approval for the use of MNSAs, until the Code requirements pertaining to the use of MNSAs are clarified.

Sincerely,

/RA/

Brian W. Sheron, Associate Director
for Project Licensing & Technical Analysis
Office of Nuclear Reactor Regulation

cc: A. Marion, NEI
B. Borchardt, NRR
J. Craig, NRR

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