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Subject: Westinghouse Comments on U.S. NRC Proposed RIS on Fatigue Analysis of Nuclear Power Plant Components

Westinghouse appreciates the opportunity to provide comments to the NRC regarding the proposed regulatory issue summary in accordance with the Federal Register Volume 73, No. 85, May 1, 2008. Our comments are attached to this letter and include recommendations to modify statements in the proposed RIS that may associate use of the Green's function methodology with a nonconservative simplification of a stress analysis application. These comments endeavor to ensure that the final RIS is a document that effectively communicates an appropriate interpretation of the expectation to be consistent with the ASME required process for calculating fatigue usage.

If you have my questions or require additional information, please contact either me or Mark Gray at (724) 722-6039.

Very truly yours,

J. A. Gresham, Manager
Regulatory Compliance and Plant Licensing

Attachment

E-RIDS = ADM-03
Add = John R. Fair (JRF)

SUNSI Review Complete
Template = ADM-013

Westinghouse Comments on U.S. NRC Proposed RIS on Fatigue Analysis of Nuclear Power Plant Components

1. The issue of concern is not clearly stated, and should not be linked to the Green's function methodology, which is not in question.

   In the Summary of Issue, the opening discussion emphasizes use of the Green's function approach to calculate stress and fatigue. It is not until about halfway through the summary that the statement is made that the "Green's function methodology is not in question," but in fact a simplification of the stress analysis application that is in question. The issue of concern over using a single stress value to represent the six-component stress tensor is independent of the use of Green's functions. The potential for non-conservatism in the simplified single-value stress application exists for any method used to determine the stresses resulting from thermal and mechanical loads and their combinations in a fatigue analysis. It would be more appropriate to state that the methodology used by some applicants does not adequately follow the ASME Code requirements for fatigue usage calculation.

   There are multiple vendors that use a Green's function method to calculate stress for ASME Code fatigue evaluations. Not all vendors that use Green's function use the simplified single-stress approach discussed in the proposed RIS. For licensees who have used an approach that applies Green's function methodology in stress analyses using six components of stress, consistent with the detailed treatment of NB-3200, there is no concern, and the emphasis on the Green's function approach can cause unnecessary concern and/or misinterpretation.

   The RIS should be revised to clarify that Green's function methodology is not the issue of concern. For example, the wording in the second sentence in the Summary of Issue should be revised to reflect the actual concern, such as:

   from:

   "This particular analysis methodology involves the use of the Green's function to calculate the fatigue usage during plant transient operations such as startups and shutdowns."

   to:

   "This particular analysis methodology involves using a simplified input of only one value of stress, as opposed to six components of stress, to calculate the fatigue usage due to plant transient operations such as startups and shutdowns."

   The subsequent language describing the Green's function approach, from "The Green's function approach involves ..." to "used to calculate the stresses caused by the actual plant temperature transients," is not necessary to describe the issue in question, and should be removed.

   The description of the "concern" should be changed, from "The concern involves a simplified input for applying the Green's function in which only one value of stress is used...," to "The concern involves a simplified input for calculating thermal stress in which only one value of stress is used..."

2. It is stated that the "staff has requested that recent license renewal applicants that have used this simplified Green's function methodology perform confirmatory analyses to demonstrate that the simplified Green's function analyses provide acceptable results." The words "simplified Green's function methodology" should be "simplified methodology." As noted, the process for calculation of fatigue usage should be consistent with ASME Code, Section III, Subsection NB, Subarticle NB-

3200. As with any analysis, a departure from the required process requires "justification." This justification should be the focus of the RIS. Green's function should not be held "hostage" or inferred as being at fault.

3. In cases where the Green's function application was utilized and benchmarked against detailed analyses to demonstrate conservatism of the method, additional confirmatory analyses should not be necessary. In some applications that use Green's function that retain six components of stress, benchmark problems are provided demonstrating the acceptability of the Green's function models compared to other calculation methods, such as detailed finite element analysis. In these cases, the existing documentation should be sufficient to confirm the acceptability of the models.