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Your ref: Docket No. NRC-2011-0229

Our ref: LTR-NRC-11-39
DCP_NRC_003193

October 20, 2011

9/30/2011
76 FR 60939
①

Subject: Docket ID NRC-2011-0229, Response to NRC Request for Comments Regarding Draft Regulatory Issue Summary, "Metal Fatigue Analysis Performed by Computer Software" (76FR60939)

The letter provides Westinghouse response and comments to the proposed Regulatory Issue Summary (RIS), "Metal Fatigue Analysis Performed by Computer Software" (76FR60939).

Westinghouse has two main comments for the staff's consideration:

- 1) A generic communication, as it pertains to WESTEMSTM¹ software, is not necessary for reasons outlined below; and
- 2) It is possible that the staff did not intend to focus the draft RIS on concerns with the WESTEMSTM computer software. If we are correct, then the draft RIS should be reworded to be more generic in nature.

Westinghouse believes that the staff concerns regarding WESTEMSTM software will be resolved. Should the staff determine to go forward with this draft RIS, our additional comments are provided in the enclosure. In addition, Westinghouse offers the following supporting information:

- Westinghouse is able to demonstrate that the calculations generated for the operating plants which use the WESTEMSTM program have not misused algebraic summations or the peak and valley options and have met all applicable ASME code limits.
- WESTEMSTM software has been used in license renewal applications to evaluate environmentally assisted fatigue (EAF) using the ASME Section III NB-3200 module. The methodology used for these evaluations is the same methodology that was reviewed by the NRC in the Salem license

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SUNSI Review Complete
Template = ADM-013
E-KIDS = ADM-03
Cde = O.Yee (oxy)

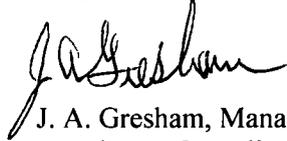
renewal audit and was concluded to be in accordance with ASME Code requirements, as stated in the draft RIS.

- The WESTEMS™ NB-3600 module has not been used in any license renewal EAF evaluations. Therefore, misuse of algebraic summation is not a concern.
- The draft RIS reiterates the recommendation that justification of user intervention and analyst judgments should be documented. Westinghouse will be addressing WESTEMS™ user guidance to ensure that additional documentation is included in calculation notes going forward.
- NRC concerns with WESTEMS™ application for applicants under 10 CFR Part 52 are expected to be resolved prior to final piping fatigue analysis completion and approvals.

We appreciate the opportunity to participate in the public comment period. Westinghouse proposes a public meeting with the staff to discuss our comments pertaining to the draft RIS at the earliest opportunity.

Questions or requests for additional information related to this letter and enclosure should be directed to me.

Very truly yours,



J. A. Gresham, Manager
Regulatory Compliance

Enclosure

1. Westinghouse Comments to Draft RIS [NRC-2011-0229], "Metal Fatigue Analysis Performed by Computer Software"

cc: E. McKenna – U.S. NRC (TWFN 6 D23)

**Westinghouse Comments to Draft RIS [NRC-2011-0229],
“Metal Fatigue Analysis Performed by Computer Software”**

Draft RIS Paragraph / Section	Current RIS Description and Comments	Proposed Resolution and Comments
General	<p>The draft RIS addresses itself both specifically to the WESTEMS™ computer software package as well as generically to computer software packages used in performing ASME Code fatigue calculations.</p> <p>Westinghouse believes that it may not be the staff’s intent on focusing on concerns with the WESTEMS™ computer software.</p>	<p>General Proposed Change – Westinghouse proposes that the NRC consider recasting the write-up to be completely generic in nature and only refer to the WESTEMS™ computer software package in the context of being one that was the subject of an audit and is representative of NRC’s concerns with all such packages.</p>
3 rd paragraph, Intent section	<p>Current RIS description – “methodologies using the computer software package, WESTEMS™, to demonstrate compliance...”</p>	<p>Change to – “...methodologies, to demonstrate compliance...”</p>
7 th paragraph, Summary of Issue	<p>Current RIS description – “... staff has identified concerns about the computer software package, WESTEMS™, that is used to...”</p>	<p>Change to – “...staff has identified potential concerns regarding the implementation of computer software packages used to...”</p>
8 th paragraph, Summary of Issue	<p>Current RIS description – “One such concern was that the methodology used by this computer software package to determine the peak stress intensity range time history in fatigue calculations uses the algebraic summation of three orthogonal moment vectors.”</p> <p>Comment – Recommended change to correct the accuracy of the current description. Westinghouse basis is that NRC has not identified in our calculations a misuse of moment inputs to an NB-3600 evaluation or an error in the engineering removal of conservative peaks and valleys in a fatigue evaluation.</p>	<p>Change to – “One such concern was that the methodology used by this computer software package to determine the peak and valley times in the total stress intensity time history used in fatigue calculations includes inputs that could be misused to include the algebraic summation of three orthogonal moment vectors.”</p>

Draft RIS Paragraph / Section	Current RIS Description and Comments	Proposed Resolution and Comments
8 th paragraph, Summary of Issue	<p>Current RIS description – “The staff also identified a concern in which, under certain circumstances, the use of this computer software package requires the user to manually modify peak and valley times/stresses during intermediate calculations in the software.”</p> <p>Comment – Recommend change to correct the accuracy of the current description.</p>	<p>Change to – “The staff also identified a concern in which, under certain circumstances, the use of this computer software package allows the user to manually modify stress peak and valley times selected for input to the fatigue usage factor calculation, during intermediate calculations in the software, to reduce identified conservatism.”</p>
8 th paragraph, Summary of Issue	<p>Current RIS description – “Although this method of analyst intervention could provide acceptable results in some cases, reliance on the user’s engineering judgment and ability to modify peak and valley times/stresses, without control and documentation, could produce results that are not predictable, repeatable, or conservative.”</p> <p>Comment – Almost all typical ASME Code fatigue evaluations have been performed using the results of stress calculations, either manual or computerized, plus engineering processing, including engineering judgment where required, to complete the fatigue evaluations consistent with Code requirements. Use of a computer tool that provides a semi-automated process and user control of inputs and parameters used in the evaluation is not inconsistent with the methods historically proven. Westinghouse QA procedures provide control of the overall process used by authors and verifiers of engineering calculations, including those that use a computer program.</p>	<p>Change to – “Analyst intervention or adjustment of computer program inputs based on user judgment and application of ASME criteria should be documented.”</p>

Draft RIS Paragraph / Section	Current RIS Description and Comments	Proposed Resolution and Comments
8 th paragraph, Summary of Issue	<p>Current RIS description – “Because of these concerns the applicant for the AP1000 design certification elected to remove the use of this computer software package from its design certification document, such that it is not used in the design for the AP1000, as documented in...”</p> <p>Comment – WESTEMS™ was removed from the Design Control Document (DCD) because it became apparent that the NRC’s concerns would not be resolved in a timely manner that would support the Design Certification and rulemaking schedule.</p>	<p>Change to – “Due to the continuing work needed to resolve the staff concerns, the applicant for the AP1000² design certification elected to remove the use of this computer software package from its design certification amendment, as documented in ADAMS Accession No. ML102770329. The Applicant is intending to gain NRC approval of WESTEMS™ software as part of the Combined Operating License (COL) design acceptance criteria (DAC) closure process.”</p>
9 th paragraph, Summary of Issue	<p>Current RIS description – “License renewal applicants have attempted to use this computer software package to demonstrate acceptable fatigue calculations for plant operation during the period of extended operation.”</p> <p>Comment – Using the word “attempted” implies that they were not successful. However, the example cited demonstrates that it was successful. This example demonstrated that engineers using the software within the QA program resulted in evaluations that are in accordance with the ASME Code methodology.</p>	<p>Change to – “License renewal applicants have used this computer software package to demonstrate acceptable fatigue calculations for plant operation during the period of extended operation.”</p>

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Draft RIS Paragraph / Section	Current RIS Description and Comments	Proposed Resolution and Comments
<p>10th paragraph, Summary of Issue</p>	<p>Current RIS description – “At the conclusion of the audit, the staff determined, as described in its audit report (ADAMS Accession No. ML110871243), that the license renewal applicant’s use of this computer software package demonstrated (1) that it produced calculations of stresses and cumulative usage factors that are consistent with the methodology in ASME Code, Section III, Subsection NB, Subarticle NB–3200, (2) that the analyst’s judgment in manually modifying peak and valley times/ stresses in these calculations was reasonable and can be appropriately justified and documented, though justification of any user intervention should be documented.”</p>	<p>Comment – This conclusion verifies that the WESTEMSTM program performs calculations according to the ASME Code Section III methodology, and that allowing the user to adjust inputs to the evaluation based on knowledge of the problem and the ASME Code requirements does not reduce the quality of the results.</p>