Gallagher, Carol

To: Gallagher, Carol
Subject: FW: CR-6909 rev1 Draft Docket ID NRC-2014-0023
Attachments: Correction to CR-6909_rev1Draft.pdf

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From: Jerzy.Cwifeld@okg.eon.se [mailto:Jerzy.Cwifeld@okg.eon.se]
Sent: Wednesday, October 14, 2015 4:18 AM
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Subject: [External_Sender] CR-6909 rev1 Draft Docket ID NRC-2014-0023

Dear Mr Stevens.
Please find attached PDF with my suggestion for correction to page C-10 in CR-6909 rev1 Draft March 2014.
Do NRC agree with my interpretation?
Do you known when the final edition of CR-6909 rev 1 will be published?

Kindly regards

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Add= G. Stevens (gls4)

v. The F_{en} was assigned to both the peak and valley for use in the CUF_{en} calculations.

vi. The above steps were repeated for all valley-peak intervals for the entire principal stress intensity history.

B. *Modified Strain Rate Approach*: In this approach, the F_{en} for each peak and valley resulting from the S_{alt} calculation process was computed using the Modified Rate Approach described in Section 4.1.14, as follows:

i. The strain rate was based on the total stress component principal stress difference, S'_{31}, which was used to compute CUF. For simplicity, K_e was conservatively not included in the calculation of strain rate.

ii. The F_{en} integration was set up and performed between each valley and peak with increasing stress, as follows (refer to Figure 80):

$$\dot{\varepsilon}_i = \frac{S'_{31\,i+1} - S'_{31\,i}}{\cancel{100}\ \Delta t\ E}\ 100$$ To make %/sec

where: $\dot{\varepsilon}_i$ = strain rate at any point, i, between the valley and peak (%/sec)
$S'_{31\,i+1}$ = S'_{31} stress intensity value at point i+1 (psi)
$S'_{31\,i}$ = S'_{31} stress intensity value at point i (psi)
Δt = time increment between points i and i+1 (seconds)
E = the Young's Modulus determined at the maximum metal temperature of points i and i+1 (psi)

iii. To neglect compressive loading in the determination of F_{en}, the F_{en} value was set to 1.0 for any point interval where $\dot{\varepsilon}$ was less than zero.

iv. The $F_{en,i}$ was calculated between for point i and I=1 using the appropriate equation from Appendix A for the material evaluated, and using the maximum metal temperature of points i and i+1.

v. The integrated $F_{en\text{-}n}$ for the valley-peak load pair was calculated as:

$$F_{en-n} = \sum_{i=1}^{k} F_{en,i} \frac{\Delta\,\varepsilon_i}{\varepsilon_{max} - \varepsilon_{min}}$$

where: $F_{en\text{-}n}$ = integrated F_{en} for valley-peak load pair n
k = number of integration points between valley and peak
$\Delta\,\varepsilon_i$ = ~~strain at any point, i, between the valley and peak computed as $S'_{31\,i}$ divided by E evaluated at the metal temperature of point i~~
see figure 80 Section 4.1.14
ε_{max} = maximum strain at the peak computed as $S'_{31\text{-peak}}$ divided by E evaluated at the metal temperature of the peak
ε_{min} = minimum strain at the valley computed as $S'_{31\text{-valley}}$ divided by E evaluated at the metal temperature of the valley
E = the Young's Modulus determined at the maximum metal temperature of points i and i+1 (psi)

vi. The F_{en} calculated in Step B(v) was assigned to both the peak and valley for use in the CUF_{en} calculations.