

## Davis-BesseNPEm Resource

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**From:** CuadradoDeJesus, Samuel  
**Sent:** Wednesday, August 03, 2011 5:51 PM  
**To:** 'custerc@firstenergycorp.com'; dorts@firstenergycorp.com  
**Subject:** Draft RAI Reactor Head Closure Studs  
**Attachments:** D-B Follow-up RAIs Reactor Head Closure Studs CLEAN -LH peer review - yee.docx

Cliff:

I let our staff (Branch chiefs/Technical reviewers) know your intent to supplement the application to address this concern as we agreed on 8/2/2011 teleconference. However, our staff will be officially sending the attached RAI soon. Let me know if you have any questions.

Regards,

**Samuel Cuadrado de Jesús**

Project Manager

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**From:** CuadradoDeJesus, Samuel

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## **Draft follow-up RAI B.2.34-2**

### Background:

In its response to RAI B.2.34-1, the applicant stated that according to the certificate of material test report (CMTR) for the reactor head closure studs, the actual measured yield strength varied from 151 to 159 ksi, and the tensile strength varied from 166 to 171 ksi. The applicant also stated that its reactor head stud material is SA-540, Grade B-23 and that as provided in Regulatory Guide (RG) 1.65, "Materials and Inspections for Reactor Vessel Closure Studs," this material when tempered to a maximum tensile strength of 170 ksi, is relatively immune to stress corrosion cracking (SCC). The applicant proposes to enhance the Reactor Head Closure Studs Program to preclude the future use of replacement closure stud bolting fabricated from material with actual measured yield strength greater than or equal to 150 ksi, except for use of the existing spare reactor head closure stud bolting.

The "preventive actions" program element of GALL AMP XI.M3, "Reactor Head Closure Stud Bolting," references the guidance in RG 1.65 and NUREG-1339, "Resolution of Generic Safety Issue 29: Bolting Degradation or Failure in Nuclear Power Plants."

### Issue:

LRA Section B.2.34 states that the Reactor Head Closure Program is an existing program that, with enhancements, will be consistent with GALL AMP XI.M3. All of the applicant's reactor head closure studs were fabricated from material with measured yield strength above 150 ksi and some of the furnished materials have a measured tensile strength above 170 ksi. The staff noted that this is an exception to the "preventive actions" program element of GALL AMP XI.M3, which recommends using bolting material for closure studs with actual measured yield strength less than 150 ksi to reduce susceptibility to SCC.

### Request:

- 1) Revise the appropriate sections of the LRA to reflect the use of reactor head closure studs with measured yield strength above 150 ksi as an exception to GALL AMP XI.M3.
- 2) Address the exception to the "preventive actions" element for using closure stud material with greater susceptibility to SCC. Justify the adequacy of the Reactor Head Closure Program to manage cracking due to SCC of high-strength bolting material. As part of the justification, describe how the program manages the potential exposure of closure bolting to boric acid water and other potential contaminants that may initiate SCC of the reactor head closure bolting studs and components.