

NRR-PMDAPEm Resource

From: Singal, Balwant
Sent: Tuesday, April 08, 2014 1:50 PM
To: Sterling, Lance
Cc: Fairbanks, Carolyn; Parks, Benjamin; Morris, James [jrmorris@STPEGS.COM]
(jrmorris@STPEGS.COM)
Subject: Request for Additional Information - Reactor Vessel Radiation Surveillance Program, South Texas project, Unit 2 - TAC MF0699
Attachments: MF0699-RAIs.docx

Lance,

By letter dated February 11, 2013 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML130530263), STP Nuclear Operating Company (STPNOC), submitted WCAP-17636, "Analysis of Capsule W from the South Texas Project Nuclear Operating Company Unit 2 Reactor Vessel Radiation Surveillance Program," October 2012, documenting the results of the examination of Capsule W. The U.S. Nuclear Regulatory Commission (NRC) staff has reviewed the report and has questions described in the attachment to this e-mail. The Draft request for additional information (RAI) was issued on March 25, 2014. The NRC staff was informed on April 8, 2014 that the NRC staff may issue the formal RAIs. STPNOC may request for a clarification call later. Your response is requested within 30 days from the date of this e-mail.

Please treat this e-mail as formal transmittal of RAIs.

Thanks.

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From: Singal, Balwant

Created By: Balwant.Singal@nrc.gov

Recipients:

"Fairbanks, Carolyn" <Carolyn.Fairbanks@nrc.gov>

Tracking Status: None

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Tracking Status: None

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REQUEST FOR ADDITIONAL INFORMATION
REACTOR VESSEL RADIATION SURVEILLANCE PROGRAM
SOUTH TEXAS PROJECT, UNIT 2

By letter dated February 11, 2013 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML130530263), STP Nuclear Operating Company, submitted WCAP-17636, "Analysis of Capsule W from the South Texas project Nuclear Operating Company Unit 2 Reactor Vessel Radiation Surveillance Program," October 2012, documenting the results of the examination of Capsule W. The U.S. Nuclear Regulatory Commission (NRC) staff has reviewed the report and has the following questions:

1. The licensee modeled the reactor and vessel using a three-dimensional representation of the problem geometry, as described in Chapter 6 of WCAP-17636-NP (Enclosure to letter dated February 11, 2013). The model used 208 radial, 197 azimuthal, and 190 axial intervals. The model is octant-symmetric. The azimuthal nodalization exceeds the 40 angular intervals suggested in Regulatory Guide (RG) 1.190, "Calculational and Dosimetry Methods for Determining Pressure Vessel Neutron Fluence," March 2001 (ADAMS Accession No. ML010890301). The recommendations for nodalization in the radial and axial directions are specific to the material and location being modeled. The RG notes that, "the adequacy of the spatial mesh and angular quadrature, as well as the convergence criterion, must be demonstrated by tightening the numerics until the resulting changes are negligible."

Please provide additional information explaining how the adequacy of the spatial mesh was validated.

2. The core neutron source was constructed based on fuel assembly-specific enrichment and burnup data for each fuel cycle of operation; this is consistent with the guidance contained in RG 1.190. The fuel assembly-specific neutron sources were derived from pin-wise isotopics represented in Cartesian geometry. The isotopic data were converted to cylindrical mesh arrays used in the RAPTOR-M3G transport calculation.

Please explain how the uncertainty associated with this conversion was determined and incorporated into the analytic uncertainty analysis, and provide additional supporting detail (i.e., provide a more detailed description of the H. B. Robinson qualification effort).

3. Section 6.1 of WCAP-17636-NP includes the statement, "Additionally, the methods used to develop the calculated pressure vessel fluence are consistent with the NRC-approved methodology described in WCAP-14040-A, Revision 4, 'Methodology Used to Develop Cold Overpressure Mitigating System Setpoints and RCS Heatup and Cooldown Limit Curves.'" Noting this statement, the NRC staff observes that the use of RAPTOR-M3G is a significant departure from the approved methodology in that the transport calculations are no longer performed using the suite of Oak Ridge National Laboratory discrete ordinates radiation transport codes, typically with a synthesis of lower-dimension calculations to determine the 3-dimensional flux field.

Please explain, more specifically, how the calculations are consistent with the WCAP-14040-A, Revision 4, methods. Please also identify any other differences between approved methodology and that described in WCAP-17636-NP.