

June 10, 2003

Carl Terry, BWRVIP Chairman
Constellation Generation Group
Nine Mile Point Nuclear Station
Post Office Box 63
Lycoming, NY 13093

SUBJECT: BWR TOP GUIDE INSPECTION AND FLAW EVALUATION GUIDELINES FOR
LICENSE RENEWAL

Dear Mr. Terry:

By letter dated December 7, 2000, the staff found the BWRVIP-26, "BWR Top Guide Inspection and Flaw Evaluation Guidelines," report to be acceptable to reference in a license renewal (LR) application to the extent specified and under the limitations delineated in the LR safety evaluation report (SER) dated September 29, 1999. Renewal applicant Action Item 4.1(4) indicates that due to the susceptibility of the top guide beams to irradiated assisted stress corrosion cracking (IASCC), applicants referencing the BWRVIP-26 report for license renewal should identify and evaluate the projected accumulated neutron fluence as a potential time-limited aging analysis (TLAA) issue.

Exelon Generation Company, in its application for license renewal for the Peach Bottom Atomic Power Station, Units 2 and 3 (Reference: Letter from Exelon dated July 2, 2001), identified that IASCC of the top guide requires a TLAA. The staff review of this evaluation is contained in the letter dated February 5, 2003, from P. T. Kuo (NRC) to M. P. Gallagher (Exelon Corporation), "License Renewal Safety Evaluation Report for Peach Bottom Atomic Power Station, Units 2 and 3."

In the BWRVIP-26 report, the BWRVIP lists 5×10^{20} n/cm² as the threshold fluence beyond which components may be susceptible to IASCC. The location on the top guide that will see this high fluence is the grid beams. This is location 1, as identified in BWRVIP-26, Table 3-2, "Matrix of Inspection Options." In its evaluation of the top guide assembly, including the grid beam, General Electric (GE) assumed a lower allowable stress value, acknowledging the high fluence value at this location. The conclusion of this analysis, and the fact that a single failure at this location has no safety consequence, was that no inspection was considered necessary to manage this potential aging effect.

The staff is concerned that multiple failures of the top guide beams are possible when the threshold fluence for IASCC is exceeded. According to BWRVIP-26, multiple cracks have been observed in top guide beams at Oyster Creek. In addition, baffle-former bolts on PWRs that exceeded the threshold fluence have had multiple failures. In order to exclude the top guide beam from inspection when its fluence exceeds the threshold value, an analysis must be provided to demonstrate that failures of multiple beams (all beams that exceed the threshold

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fluence) will not impact the safe shutdown of the reactor during normal, upset, emergency, and faulted conditions. If this cannot be demonstrated, then an inspection program to manage this aging effect to preclude loss of component intended function is required.

In Attachment 3 to a letter from M. P. Gallagher to USNRC dated January 14, 2003, Exelon provided a revised Reactor Pressure Vessel and Internals ISI Program which indicates Peach Bottom will perform augmented inspections for the top guide similar to the inspections of control rod drive housing (CRDH) guide tubes.

The staff believes that a comprehensive evaluation of the impact of IASCC and multiple failures of the top guide beams is necessary, and that an inspection program for top guide beams for all BWRs should be developed by the BWRVIP to ensure that all BWRs can meet the requirements of 10 CFR Part 54 throughout the period of extended operation. Therefore, the staff requests that the BWRVIP undertake this evaluation and provide the staff with its results and conclusions. Please note that this issue has been discussed with Robin Dyle, Technical Chairman BWRVIP Assessment Committee. Please contact Barry Elliot of my staff at 301-415-2709 if you have any further questions regarding this subject.

Sincerely,

/RA/

William H. Bateman, Chief
Materials and Chemical Engineering Branch
Division of Engineering
Office of Nuclear Reactor Regulation

cc: BWRVIP Service List

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/RA/

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