

March 25, 2003

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

SUBJECT: NON-DESTRUCTIVE EXAMINATION FLAW SIZING UNCERTAINTY

Dear Mr. Terry:

References:

1. Letter from Carl Terry (BWRVIP Chairman) to NRC Document Control Desk, "Project 704 – BWR Vessel and Internals Project, Shroud Vertical Weld Inspection and Evaluation Guidelines (BWRVIP-63), EPRI Report TR-1131170, June 1999," dated July 1, 1999.
2. Letter from Carl Terry (BWRVIP Chairman) to NRC Document Control Desk, "PROJECT NO. 704 -- BWRVIP Partial Response to the NRC Final Safety Evaluation of BWRVIP-63," dated October 22, 2002.

In the context of topical report "BWR Vessel and Internals Project, Shroud Vertical Weld Inspection and Evaluation Guidelines (BWRVIP-63)" [Reference 1], a question has been raised by the NRC staff regarding the treatment of non-destructive examination (NDE) flaw sizing uncertainty in the flaw evaluation procedures proposed by the BWRVIP. Although this question was raised with regard to BWRVIP-63, it is our understanding that it also applies to other inspection and evaluation (I&E) topical reports which the BWRVIP intends to submit for other components covered by the BWRVIP programs.

The staff understands the BWRVIP position on the treatment of NDE flaw sizing uncertainty [Reference 2] and its potential impact on structural factors established within the BWRVIP flaw evaluation guidelines to be as follows. When a flaw is sized using a specific inspection technique/procedure (which could be either volumetric (ultrasonic examination) or surface (visual)), the licensee establishes what uncertainty in flaw dimension(s) (i.e., length and depth if a volumetric examination is being used, length only if a surface examination is being used) is associated with the inspection technique/procedure. Provided that the NDE flaw sizing uncertainty associated with the inspection technique/procedure is less than the limits specified in Reference 2, the NDE flaw sizing uncertainty does not have to be explicitly accounted for in the flaw evaluation. The assumption upon which this conclusion is based is that NDE flaw sizing uncertainty up to the specified maximum value would not significantly impact the structural factors required in the flaw evaluation procedure. If the NDE flaw sizing uncertainty associated with the specific inspection technique/procedure which the licensee is using is not less than the specified maximum value, the licensee is expected to include NDE flaw sizing uncertainty in their flaw evaluation.

In order to support this position, the staff requests that the BWRVIP provide the following:

1. Evaluate the components which are covered by BWRVIP I&E guidelines and which are, or may be, subject to volumetric examination methods under the BWRVIP programs. Identify a component (e.g., core spray piping/header) which generally exhibits a lesser degree of "flaw tolerance" (i.e., one for which the flaw size which would lead to structural factors not being met is relatively small). Provide an evaluation which demonstrates the structural factors which would be maintained if the predetermined maximum value established for volumetric examination NDE flaw sizing uncertainty were added to the largest flaw (without NDE flaw sizing uncertainty) which would just meet the flaw evaluation structural factors.
2. Evaluate the components which are covered by BWRVIP I&E guidelines and which are, or may be, subject to surface examination methods under the BWRVIP programs. Identify a component (e.g., core should vertical welds) which generally exhibits a lesser degree of "flaw tolerance" (i.e., one for which the flaw size which would lead to structural factors not being met is relatively small). Provide an evaluation which demonstrates the structural factors which would be maintained if the predetermined maximum value established for surface examination NDE flaw sizing uncertainty were added to the largest flaw (without NDE flaw sizing uncertainty) which would just meet the flaw evaluation structural factors.
3. In light of the observed structural factor reductions from items a. and b. above, discuss the various conservative assumptions (e.g., use of a bounding crack growth rate, lower bound material properties, etc.) which are included in BWRVIP I&E flaw evaluation guidelines. Discuss how these conservatisms support the conclusion that the affect of excluding the predetermined maximum value established for NDE flaw sizing uncertainty is insignificant in the overall flaw evaluation process.

Please contact Matthew Mitchell of my staff at (301) 415-3303 if you have any further questions regarding this subject.

Sincerely,

*/RA/*

Stephanie Coffin, Chief  
Vessels & Internals Integrity and Welding Section  
Materials and Chemical Engineering Branch  
Division of Engineering  
Office of Nuclear Reactor Regulation

Enclosure: As stated

cc: BWRVIP Service List

Carl Terry

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**/RA/**  
 Stephanie Coffin, Chief  
 Vessels & Internals Integrity and Welding Section  
 Materials and Chemical Engineering Branch  
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 Office of Nuclear Reactor Regulation

Enclosure: As stated

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