August 10, 2000

Carl Terry, BWRVIP Chairman
Niagara Mohawk Power Company
Post Office Box 63
Lycoming, NY 13093

SUBJECT: FINAL SAFETY EVALUATION OF THE "BWRVIP VESSEL AND INTERNALS PROJECT, INTERNAL CORE SPRAY PIPING AND SPARGER REPLACEMENT DESIGN CRITERIA (BWRVIP-16)," AND OF THE "BWRVIP VESSEL AND INTERNALS PROJECT, INTERNAL CORE SPRAY PIPING AND SPARGER REPAIR DESIGN CRITERIA (BWRVIP-19)" (TAC NOS. M98266 AND M96539)

Dear Mr. Terry:

The NRC staff has completed its review of the Electric Power Research Institute (EPRI) proprietary reports TR-106708, "BWR Vessel and Internals Project, Internal Core Spray Piping and Sparger Replacement Design Criteria (BWRVIP-16)," dated March 18, 1997, as supplemented by letters dated March 27, 1998, and December 6, 1999; and TR-106893, "BWR Vessel and Internals Project, Internal Core Spray Piping and Sparger Repair Design Criteria (BWRVIP-19)," dated September 16, 1996, as supplemented by letters dated February 24, 1997, and December 6, 1999.

By letter dated November 16, 1998, the NRC staff issued its initial safety evaluation report (SER) of the BWRVIP-16 and -19 reports, which found that the guidance of the BWRVIP-16 and -19 reports to be acceptable for replacement and/or repair, as applicable, of the subject safety-related RPV internal components, except where the staff's conclusions differed from BWRVIP's. BWRVIP was requested to resolve the open issues raised in the staff's initial SER. By letter dated December 6, 1999, a response was provided which proposed to resolve these issues.

The NRC staff has reviewed the BWRVIP-16 and -19 response, and has found in the enclosed final SER (FSER) that the BWRVIP-16 and -19 reports, as revised, are acceptable for replacement and/or repair, as applicable, of the subject safety-related RPV internal components, except where the staff's conclusions differ from BWRVIP's. This finding, based upon the information submitted by the above cited letters, is consistent with NRC approved methodology. Therefore, the staff has concluded that licensee implementation of the guidelines in the BWRVIP-16 and -19 reports, as revised, will provide an acceptable repair and/or replacement design criteria of the safety-related components addressed in the BWRVIP-16 and -19 reports.

In accordance with the procedures established in NUREG-0390, "Topical Report Review Status," the staff requests that BWRVIP publish the accepted versions of the BWRVIP-16 and -19 reports within 90 days after receiving this letter. In addition, the published version shall incorporate this letter and the enclosed FSER, as well as the staff's RAIs and initial SER, between the title page and the abstract.

Please contact C. E. (Gene) Carpenter, Jr., of my staff at (301) 415-2169 if you have any further questions regarding this subject.

Sincerely,

/ra by R H Wessman for/

Jack R. Strosnider, Director
Division of Engineering
Office of Nuclear Reactor Regulation

Enclosure: as stated

cc: See next page

Please contact C. E. (Gene) Carpenter, Jr., of my staff at (301) 415-2169 if you have any further questions regarding this subject.

Sincerely,

Jack R. Strosnider, Director
Division of Engineering
Office of Nuclear Reactor Regulation

Enclosure: as stated

cc: See next page

Distribution:

EMCB R/F	TYChang	WLanning, Ri
ACRS	MEMayfield	BMallet, R2
GHolahan	EHackett	JGrobe, R3
KRWichman		AHowell, R4

DOCUMENT NAME: G:\EMCB\BWRVIP\BWRVIP 16&19 FSER.WPD
INDICATE IN BOX: "C"=COPY W/O ATTACHMENT/ENCLOSURE, "E"=COPY W/ATT/ENCL, "N"=NO COPY

OFFICE	EMCB:DE		EMCB:DE		EMCB:DE		EMCB:DE	
NAME	EVAndruszkiewicz:ava		CECarpenter:cec		RAHermann:rah		WHBateman:whb	
DATE	7 /11 /00		7 /17 /00		7 /18 /00		7/20 /00	

OFFICE	SRXB:BC		DD:DE		D:DE	
NAME	JWermiejw		RHWessman:rhw		JRStrosnider:jrs	
DATE	8 / 4 /00		8 / 10 /00		8 / 10 /00	

OFFICIAL RECORD COPY

George Vanderheyden, Executive Chair
Assessment Committee
UNICOM (ComEd)
1400 Opus Place Suite 400
Downers Grove, IL 60515-1198

Bill Eaton, Executive Chair
Inspection Committee
Entergy Operations, Inc.
PO Box 756, Waterloo Rd
Port Gibson, MS 39150-0756

Larry Steinert
EPRI
Po Box 10412 3412 Hillview Ave
Palo Alto CA 94303

H. Lewis Sumner, Executive Chair
BWRVIP Mitigation Task
Southern Nuclear Operating Co.
M/S BIN B051, PO Box 1295
40 Inverness Center Parkway
Birmingham, AL 35201

Harry P. Salmon, Executive Chair
BWRVIP Integration Task
New York Power Authority
123 Main St., M/S 11 D
White Plains, NY 10601-3104

George T. Jones, Executive Chair
BWRVIP Repair Task
Pennsylvania Power & Light, Inc.
M/S GEN A 61 2 N 9th Street
Allentown, PA 18101-1139

Robert Carter, EPRI BWRVIP
Assessment Manager
Greg Selby, EPRI BWRVIP
Inspection Manager
EPRI NDE Center
P. O. Box 217097
1300 W. T. Harris Blvd.
Charlotte, NC 28221

Joe Hagan, BWRVIP Vice Chair
PEPCO Energy Co.
MC 62C-30
965 Chesterbrook Blvd
Wayne, PA 19807-5691

Richard Ciemiewicz, Technical Chair
Assessment Committee
PECO Energy Co.
63B-3
965 Chesterbrook Blvd.
Wayne, PA 19087-5691

Carl Larsen, Technical Chairman
BWRVIP Inspection Task
P.O. Box 157
Vernon, VT 05354

John Wilson, Technical Chairman
BWRVIP Mitigation Task
Clinton Power Station, M/C T-31C
P.O. Box 678
Clinton, IL 61727

Vaughn Wagoner, Technical Chairman
BWRVIP Integration Task
Carolina Power & Light Company
One Hannover Square 9C1
P.O. Box 1551
Raleigh, NC 27612

Bruce McLeod, Technical Chairman
BWRVIP Repair Task
Southern Nuclear Operating Co.
PO Box 1295 40 Inverness Center Parkway
Birmingham, AL 35201

Tom Mulford, EPRI BWRVIP
Integration Manager
Raj Pathania, EPRI BWRVIP
Mitigation Manager
Ken Wolfe, EPRI BWRVIP
Repair Manager
Electric Power Research Institute
P. O. Box 10412 3412 Hillview Ave.
Palo Alto, CA 94303

Jack Dillich, BWRVIP Liaison
to EPRI Nuclear Power Council
Nebraska Public Power District
1200 Prospect Avenue PO Box 98
Brownville, NE 68321-0098

U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR REACTOR REGULATION FINAL SAFETY EVALUATION OF "BWRVIP VESSEL AND INTERNALS PROJECT, INTERNAL CORE SPRAY PIPING AND SPARGER REPLACEMENT DESIGN CRITERIA (BWRVIP-16)" EPRI REPORT TR-106708, MARCH 1997, AND "BWRVIP VESSEL AND INTERNALS PROJECT, INTERNAL CORE SPRAY PIPING AND SPARGER REPAIR DESIGN CRITERIA (BWRVIP-19)" EPRI REPORT TR-106893, SEPTEMBER 1996

1.0 INTRODUCTION

1.1 Background

By letter dated March 18, 1997, as supplemented by letters dated March 27, 1998, and December 6, 1999, the Boiling Water Reactor Vessel and Internals Project (BWRVIP) submitted the Electric Power Research Institute (EPRI) proprietary Report TR-106708, "BWR Vessel and Internals Project, Internal Core Spray Piping and Sparger Replacement Design Criteria (BWRVIP-16)." The BWRVIP-16 report provides general design acceptance criteria for full and/or partial replacement of 300 series stainless steel internal core spray piping, spargers and supports and is intended to assist licensees in designing replacements which will maintain the structural integrity of the core spray system under normal operation as well as under postulated transient and design basis accident conditions. In response to the staff's request for additional information (RAI) dated December 15, 1997, BWRVIP provided supplemental information in a letter dated March 27, 1998, and responded to the staff's November 17, 1998, initial safety evaluation report (SER) by letter dated December 6, 1999. A non-proprietary version of this report was provided by letter dated March 7, 2000.

By letter dated September 16, 1996, as supplemented by letters dated February 24, 1997, and December 6, 1999, BWRVIP submitted the EPRI proprietary Report TR-106893, "BWR Vessel and Internals Project, Internal Core Spray Piping and Sparger Repair Design Criteria (BWRVIP-19)." The BWRVIP-19 report provides general design acceptance criteria for temporary and permanent repair of 300 series stainless steel internal core spray piping and spargers. In response to the staff's RAI dated January 22, 1997, BWRVIP provided supplemental information in a letter dated February 24, 1997, and responded to the staff's November 17, 1998, initial SER by letter dated December 6, 1999. A non-proprietary version of this report was provided by letter dated March 7, 2000.

On November 17, 1998, the NRC staff issued its initial SER of the BWRVIP-16 and -19 reports, which found the guidance of the BWRVIP-16 and -19 reports acceptable for replacement and/or repair, as applicable, of the subject safety-related RPV internal components, except where the staff's conclusions differ from BWRVIP's. BWRVIP was requested to resolve the open issues raised in the staff's initial SER. By letter dated December 6, 1999, BWRVIP provided a response which proposed to resolve these open issues.

1.2 Purpose

The staff reviewed the BWRVIP-16 and -19 reports, as supplemented, to determine whether the revised guidance addressed the open items in the staff's initial SER, and if the revised reports would provide acceptable levels of quality for replacement and/or repair of the safety-related internal core spray piping and spargers.

1.3 Organization of this Report

Because the BWRVIP-16 and -19 reports are proprietary, this SER was written so as not to repeat proprietary information contained in the reports. The staff does not discuss in any detail the provisions of the guidelines nor the parts of the guidelines it finds acceptable. In as the two reports were virtually identical, except for one being for replacement and the other for repair, the staff has combined its review into a single SER which addresses both reports.

2.0 SUMMARY OF BWRVIP-16 AND -19 REPORTS

The BWRVIP-16 and -19 reports address the following topics in the following order:

- Internal Core Spray Piping and Sparger Characteristics and Safety Function: This section provides a generic physical description of the subject safety-related components, the safety design bases, and event analyses for normal operation, anticipated operational occurrences (upset conditions), design basis accidents (emergency/faulted conditions), and various loading combinations.
- Replacement / Repair Scope and Design Objectives: provides the scope of the proposed replacement / repair, and the design objectives, including replacement / repair design life, safety design bases, safety analysis events, structural integrity, retained flaw(s), loose parts considerations, physical interfaces with other reactor internals, and replacement / repair installation.
- General Design Criteria and Structural and Design Evaluation: describes the significant service load conditions and load combinations for the core spray piping and supports and core spray spargers and supports, allowable stresses, consideration of shroud repair or cracking, flow induced vibration, repair impact on existing internal components, radiation effects on replacement / repair design, analysis codes, thermal cycles, and corrosion allowance.
- System Evaluation: leakage impact for normal operation and accident conditions, leakage acceptance criteria for internal core spray piping and core spray spargers, internal core spray piping pressure drop, impact to flow distribution, emergency operating procedure (EOP) calculations, power uprate considerations, internal core spray piping high point vent, sparger spray distribution.
- Materials, Fabrication and Installation: describes materials to be used, crevices, welding and fabrication, pre-installation as-built inspection, installation cleanliness, ALARA considerations, and qualification of critical design parameters.
- Inspection: describes inspection access, pre and post installation inspection, quality assurance program and design basis documentation.

3.0 STAFF EVALUATION

The staff's November 17, 1998, SER provided six open items. BWRVIP, by letter dated December 6, 1999, addressed these items, which are discussed below.

Item 3.1: Leakage paths may result from previously repaired or replaced reactor internals. The impact of this leakage should be evaluated for normal operations and accident conditions.

BWRVIP Response to Item 3.1: BWRVIP agrees with the comment. The issue is addressed in Section 8 of both the Repair and the Replacement Design Criteria documents.

Staff's Evaluation of BWRVIP's Response to Item 3.1: The staff finds BWRVIP's response acceptable.

Item 3.2: Licensees should evaluate the amount of core spray leakage and its effect on localized cooling of the fuel and establish that leakage from core spray spargers is not a concern on a plant-specific basis.

BWRVIP Response to Item 3.2: BWRVIP agrees with the comment. The documents will be revised to eliminate the distinction of "geometry critical" and "geometry tolerant" plants and to require confirmation that leakage from core spray spargers is not a concern on a plant specific basis.

Staff's Evaluation of BWRVIP's Response to Item 3.2: The staff finds BWRVIP's response acceptable.

Item 3.3: Core spray sparger replacement and spray distribution for all BWR types should be consistent with the original design basis and plant-specific analyses should be used if the original design basis cannot be maintained.

BWRVIP Response to Item 3.3: BWRVIP agrees with the comment. The issue is addressed in Section 8.7 of both documents: "The flow distribution over the core shall be at least as good as the original design unless plant specific accident analysis justifies otherwise." Note also that the discussion of "geometry critical" plants will be removed from Section 8.7.

Staff's Evaluation of BWRVIP's Response to Item 3.3: The staff finds BWRVIP's response acceptable.

Item 3.4: The materials requirements specified in Section 9.1 are acceptable with the exception of items 4-1 - 4-4 below.

Item 4-1: In Section 9.1.2, it is stated that "Materials shall be manufactured in accordance with ASTM or ASME specifications using . . . " The words "ASTM specification" referenced in this Section should be deleted since only the materials covered by the scope of ASME Section III, Material Requirements, are acceptable and, furthermore, not all ASTM materials specifications are covered by equivalent ASME Material Specifications. However, it is acceptable if the referenced sentence is revised as "Materials shall be manufactured in accordance with ASME or equivalent ASTM specifications using . . . "

Item 4-2: In the third sentence of Section 9.1.2 regarding the use of alternative materials not covered by the scope of ASME Section III Material Requirements, the staff recommends that the words “and approved by the governing regulatory authority” should be added to the end of the sentence so that it would be consistent with the requirements specified in Section 9.1.8.

Item 4-3: The note of Section 9.1 discussed the acceptance by the plant owner of specific exceptions to the documents of EPRI NP-7032, “Material Specification for Alloy X-750 for Use in LWR Internal Components, Rev. 1,” and EPRI #84-MG-18, “Nuclear Grade Stainless Steel, Procurement, Manufacturing and Fabrication Guidelines.” The staff recommends that the words “and the governing regulatory authority” should be added to the end of the note to indicate that any exceptions to these documents require the acceptance by NRC as well as the plant owner.

BWRVIP Response to Items 4-1, 4-2 and 4-3: BWRVIP members recognize that repair and replacement designs for plants with internals which were designed and constructed in accordance with ASME Section III must meet the rules of ASME Section XI. Section XI requires that repairs or replacements meet the applicable requirements of ASME Section III and the Owner’s Original Design Specification. This would include the applicable Code materials requirements. If the Code is not met, a relief request to allow a technical alternative to the Code pursuant to 10 CFR 50.55a must be requested.

Section XI rules for repair and replacement also applies to components that were not designed to Section III, but are classified by the Owner as “Welded Core Support Structures” and are subject to inspection under Section XI Category B-N-1 from Table IWB-2500-1. These components are to be repaired or replaced in accordance with the Owner’s original Design Specification and Construction Code. NRC allows later approved versions of Section III to be used. If this requirement is not met, approval of a technical alternative must be sought pursuant to 10CFR50.55a.

Repair and replacement designs for plants which were not designed and constructed in accordance with ASME Section III (and components not subject to Section XI) must meet the individual plant SAR and other plant commitments for RPV internals mechanical design, as stated in Section 6. In that instance, materials must meet the requirements of ASME Section II specifications, ASME Code Cases, ASTM specifications, or other material specifications that have been previously approved by the regulatory authorities. This would include material specifications/criteria submitted by BWRVIP and approved by NRC. Otherwise, it is recognized that a repair or replacement design that uses a material not meeting these criteria must be submitted on a case by case basis to the regulatory authorities for approval, on a plant specific basis.

Staff’s Evaluation of BWRVIP’s Response to Item 4-1, 4-2, and 4-3: The staff finds that, for Items 4-1 and 4-2, the statements in the staff’s initial SER should be included in the BWRVIP-16 and -19 reports in Sections 9.1 and 9.1.2, respectively. The staff further finds that a statement such as the one in the third paragraph of BWRVIP’s response to Items 4-1, 4-2 and 4-3, above, should be included in the BWRVIP-16 and -19 reports in Section 9.1.2.

Item 3.4, Item 4-4: In Section 9.1.5, the rising-load test is waived and the requirement of cobalt control can be waived by the plant owner when procuring Alloy X-750 in accordance with

EPRI NP-7032. In a response to the staff's concerns regarding these exceptions as discussed in the staff's RAI, BWRVIP proposed a revision of section 9.1.5 by adding a cautionary note regarding minimizing the cobalt content; however, the appropriate cobalt limits are left to the discretion of the plant owner. The staff has determined that the revised version of Section 9.1.5 is not acceptable, since it still waives the requirement of rising load test and allows the plant owner to set the cobalt limit without any justification. The requirement of rising-load test should be retained since this test is used to confirm that the subject materials have been properly heat-treated to the "CIB" condition. The "CIB" condition is the only condition that is acceptable for use in the BWR environment. There is no other metallurgical test that can be used to confirm the "CIB" condition such as the use of the sensitization test to confirm the acceptable metallurgical condition for the 300 series austenitic stainless steel. The requirement to minimize the cobalt content in Alloy X-750 is needed for ALARA consideration, because the cobalt content in Alloy X-750 will generate oxidation products with a high level of radiation which is not desirable. Therefore, the requirement of cobalt control should be retained in procuring Alloy X-750 materials. In a BWR report of "BWR Core Shroud Repair Design Criteria" which the NRC has recently approved for use, the requirements of the rising-load test and cobalt control are not waived in procuring Alloy X-750 in accordance with EPRI NP-7032.

BWRVIP Response to Item 4-4: The rising load test as described in NP-7032 will be retained in order to provide verification by physical testing that the specified heat treatment was properly performed.

The allowable cobalt level for individual heats of alloy X-750 will be specified as 0.25 percent maximum. If this limit is exceeded, an alternative evaluation protocol that can be implemented by the licensee will be provided. The alternative criteria will be a maximum allowable weighted average cobalt level of 0.25 percent, taking into account the surface area of all newly installed components wetted by reactor coolant.

Staff's Evaluation of BWRVIP's Response to 3.4, Item 4-4: The staff finds BWRVIP's response stating that the rising load test, as described in NP-7032, will be retained to be acceptable.

Regarding BWRVIP's response on allowable cobalt levels for individual heats of alloy X-750, this criterion does not meet the requirements of NP-7032 for cobalt limits. However, in a June 27, 2000, e-mail from K. Wolfe of EPRI to C. E. Carpenter of NRC, Mr. Wolfe states:

> "The older number [i.e., 0.015 percent, which is the current limit for cobalt found in NP-7032] was based on manufacturers estimates of the lowest cobalt that could be maintained in new melts of material. It was included in the [specification] for the purpose of overall cobalt reduction (i.e., it was not a metallurgical consideration) although its basis was not directly related to that end. The revised number is also included in the [specification] for purposes of overall cobalt reduction. It is based on realistic consideration of the cobalt level necessary to limit radiation from cobalt. Given the small amount of X-750 typically used in a repair and the fact that it is not typically used in an abrasive application (i.e., one in which a significant amount of material could find its

way into the reactor water and migrate through the system), the revised, higher number is appropriate."

With this new information on cobalt limits, the staff finds this section acceptable.

Item 3.5: Until the staff's confirmatory research on the weldability of highly irradiated materials is completed, the staff's recommendation is that the weldability of such materials should be demonstrated on a mock-up made of materials with similar level of radiation damage and helium content. Further, this recommendation and any other available guidelines should be added into Section 9.3.7 of the BWRVIP reports.

BWRVIP Response to Item 3.5: BWRVIP agrees that welded repairs on highly irradiated components require additional considerations. To provide additional guidance in this area, the BWRVIP Repair Committee is developing a "white paper" for use by utilities until the staff's (and BWRVIP's) confirmatory research is complete. The white paper will describe a region of the vessel inside of which irradiation effects may be important. Before performing a welded repair to a component inside this region, it will be required that a small material sample be taken and analyzed for helium content. If the helium content is below some threshold (~0.1 appm), conventional welding can be used. If the helium is above the threshold, special welding techniques may be required. Guidelines on the appropriate qualification of the special techniques will be provided in the white paper.

While it would be desirable to demonstrate the weldability of irradiated materials in a mockup of similar configuration and helium content for each repair, it is not feasible to do so.

BWRVIP will submit the white paper to the NRC for review when it is completed.

Staff's Evaluation of BWRVIP's Response to Item 3.5: Staff approval of welded repair procedure on highly irradiated components addressed in Item 3.5 is pending and will be based upon the staff's review of BWRVIP's submittal of the white paper discussing the appropriate qualification of the special welding techniques, and the completion of the staff's review of the BWRVIP-45 report, "Weldability of Irradiated LWR Structural Components," which is presently on hold while additional data is gathered by the Office of Nuclear Regulatory Research (RES). This will be addressed in the staff's SER for BWRVIP-45.

Item 3.6: Section 10.2, Pre- and Post- Installation Inspection. The BWRVIP-18 report should be referenced in Section 10.2 to ensure the inspection requirements stated in this section are consistent with those required in the BWRVIP-18 report.

BWRVIP Response to Item 3.6: The inspection recommendations of BWRVIP-18 may not be appropriate for a repaired or replaced component. For example, if a clamp structurally replaces a cracked weld, it will no longer be necessary to inspect the weld as described in BWRVIP-18. Additionally, if a section of piping is replaced, the design would use materials that are superior to the original piping and may eliminate certain welds from the original design. In this case, a revised inspection scope and schedule would be appropriate and the recommendations of BWRVIP-18 would not be applicable.

Clearly, the inspection recommendations of BWRVIP-18 must be adjusted when inspections are defined for the repaired/replaced components.

Staff's Evaluation of BWRVIP's Response to Item 3.6: The BWRVIP-18 report shall be cited, as applicable, for those inspection requirements which are consistent with the guidance of the BWRVIP-18 report. In cases where the inspection recommendations of the BWRVIP-18 report are not applicable for a modified repair or replacement procedure, BWRVIP shall develop a revised inspection scope consistent with the guidance of the BWRVIP-18 guidelines.

4.0 CONCLUSIONS

The NRC staff has reviewed the BWRVIP-16 and -19 reports, associated RAI responses and the response to the staff's initial SER. The staff has found that the guidance of the reports, as modified and clarified to incorporate the staff's comments above, is acceptable for replacement and/or repair of the subject safety-related core spray internal components. This finding, based upon the information submitted in the subject report and RAI and SER responses, is consistent with NRC approved methodology. Therefore, the staff has concluded that licensee implementation of the guidelines in the BWRVIP-16 and -19 reports, as modified, will provide an acceptable repair design criteria of the safety-related components as discussed above. The modifications stated in the RAI and SER and addressed above should be incorporated in Revision 1 of the BWRVIP-16 and19 reports.

5.0 REFERENCES

1. Carl Terry, BWRVIP, to USNRC, "BWR Vessel and Internals Project, Internal Core Spray Piping and Sparger Replacement Design Criteria (BWRVIP-16)," EPRI Report TR-106708, March 1997, March 18, 1997.

2. Bruce McLeod, BWRVIP, to C. E. Carpenter, USNRC, "BWRVIP Response to NRC Request for Additional Information on BWRVIP-19," February 24, 1997.

3. C. E. Carpenter, USNRC, to Carl Terry, BWRVIP, "Proprietary Request for Additional Information - Review of BWR Vessel and Internals Project Reports, 'BWR Core Spray Inspection and Flaw Evaluation Guidelines (BWRVIP-18),' and 'Core Spray Piping and Sparger Repair Design Criteria (BWRVIP-19),' (TAC Nos. M96219 and M96539)," January 22, 1997.

4. J. T. Beckham, BWRVIP, to USNRC, "BWR Vessel and Internals Project, BWR Core Spray Internals Inspection and Flaw Evaluation Guidelines (BWRVIP-18)," EPRI Report TR-106740, July 1996.

5. USNRC to Carl Terry, BWRVIP, "Safety Evaluation of the BWR Vessel and Internals Project BWRVIP-18 Report (TAC NO. M96219)," June 8, 1998.

6. BWRVIP response to staff's November 17, 1998, initial SER, dated December 6, 1999.