

November 5, 2008

Peter P. Sena III
Site Vice President
FirstEnergy Nuclear Operating Company
Beaver Valley Power Station
Mail Stop A-BV-SEB-1
P.O. Box 4, Route 168
Shippingport, PA 15077

SUBJECT: AUDIT REPORT REGARDING THE BEAVER VALLEY POWER STATION,
UNIT 1 AND 2, LICENSE RENEWAL APPLICATION

Dear Mr. Sena:

By letter dated August 27, 2007, FirstEnergy Nuclear Operating Company, Units 1 and 2, submitted an application pursuant to 10 *Code of Federal Regulations* Part 54 (10 CFR Part 54), to renew the operating license for Beaver Valley Power Station for review by the U.S. Nuclear Regulatory Commission (NRC or the staff). On March 7, 2008, the NRC audit team completed the on-site audit of aging management programs. The audit report is enclosed.

If you have any questions, please contact me at 301-415-2989 or by e-mail at Kent.Howard@nrc.gov.

IRA

Kent Howard, Project Manager
Projects Branch 2
Division of License Renewal
Office of Nuclear Reactor Regulations

Docket Nos. 50-334 and 50-412

Enclosure:
As stated

cc w/encl: See next page

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OFFCIE	LA:DLR	PM:RPB2:DLR	BC:RPB1:DLR	BC:RER2:DLR	BC:RPB2
NAME	IKing	KHoward	JDozier	RAuluck	RFranovich (DWrona for)
DATE	08/08/08	11/05/08	08/10/08	08/19/08	11/05/08

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U.S. NUCLEAR REGULATORY COMMISSION

OFFICE OF NUCLEAR REACTOR REGULATION - DIVISION OF LICENSE RENEWAL

Docket No: 050-00334 and 050-00412

License No: DPR-66 and NPF-73

Licensee: FirstEnergy Nuclear Operating Company

Facility: Beaver Valley Power Station, Units 1 and 2

Location: Mailstop A-BV-SEB-1
Route 168
Shippingport, PA 15077

Dates: March 3-7, 2008

Reviewers: K. Howard, Project Manager, Division of License Renewal (DLR)
K. Chang, Branch Chief, DLR
J. Medoff, Sr. Mechanical Engineer, DLR
J. Davis, Sr. Materials Engineer, DLR
R. Sun, Mechanical Engineer, DLR
D. Hoang, Structural Engineer, DLR
Z. Xi, Structural Engineer, DLR
D. Nguyen, Electrical Engineer, DLR
R. Li, Electrical Engineer, DLR
E. Patel, Consultant (ISL)
C. Marks, Consultant (ISL)

Approved By: Rajender Auluck, Chief
Engineering Review Branch 2
Division of License Renewal
Office of Nuclear Reactor Regulation

Jerry Dozier, Chief
Engineering Review Branch 1
Division of License Renewal
Office of Nuclear Reactor Regulation

ENCLOSURE

Introduction

A five-day audit was conducted by the NRC project team at the plant in Shippingport, PA on March 3-7, 2008. The purpose of this audit was to examine the applicant's Aging Management Programs (AMPs) documentation for Beaver Valley Power Station (BVPS) Units 1 & 2 and to verify the applicant's claim of consistency with the corresponding GALL AMPs. Exceptions to the GALL AMP elements will be evaluated separately as part of the NRC staff's (the staff) review of BVPS license renewal application (LRA) and documented in the staff's Safety Evaluation Report (SER).

The Standard Review Plan for Review of License Renewal Applications for Nuclear Power Plants (NUREG-1800) provides the staff guidance for reviewing a license renewal application (LRA). The Standard Review Plan allows an applicant to reference in its LRA the AMPs described in NUREG-1801, "Generic Aging Lessons Learned (GALL) Report." By referencing the GALL AMPs, the applicant concludes that its AMPs correspond to those AMPs which are reviewed and approved in the GALL Report, and that no further staff review is required. If an applicant credits an AMP for being consistent with a GALL program, it is incumbent on the applicant to ensure that the plant program contains all of the elements of the referenced GALL program. The applicant's determination should be documented in an auditable form and maintained on-site.

During this audit, the staff audited program elements 1-6, and program element 10, (operating experience), of the applicant's AMPs claimed to be consistent with the GALL report against the related elements of the associated AMP described in the GALL Report, unless otherwise indicated in this Audit Report. Elements 7-9 which address corrective actions, confirmation process, and administrative controls were audited by another NRC project team during the Scoping and Screening Methodology audit and are evaluated separately. The NRC project team audited all AMPs that the applicant stated were consistent with the GALL report AMPs.

During this audit, if an applicant took credit for a program in the GALL Report, the staff verified that the plant program contains all the elements of the referenced GALL Report program. In addition, the staff verified the conditions at the plant were bounded by the conditions for which the GALL Report program was evaluated.

In performing this audit, the staff examined the applicant's program bases documents and related references for these AMPs. The NRC project team also interviewed Beaver Valley representatives to obtain additional clarification related to the BVPS AMPs. This report documents the staff activities during this audit.

LRA AMP B.2.1, 10 CFR Part 50, Appendix J

In the Beaver Valley LRA, the applicant stated that BVPS AMP B.2.1 is an existing program that is consistent with GALL AMP XI.S4, “10 CFR Part 50, Appendix J.”

During its audit, the staff audited the applicant’s on-site documentation supporting the applicant’s conclusion that the AMP elements are consistent with the elements in the GALL AMP XI.S4. The staff interviewed the applicant’s technical staff and audited the following on-site documents.

DOCUMENT	TITLE	REVISION /DATE
LRBV-PED-XI.S4	10 CFR Part 50, Appendix J	Rev. 2, 06/28/07
LRVB-OE-001	Operating Experience Review Report	Rev. 3, 01/16/08
1BVT 1.47.1	Unit 1 Containment Structural Integrity Test	Rev. 9, 03/30/06
2BVT 1.47.1	Containment Structural Integrity Test	Rev. 7, 09/08/06
CR 06-02024	1R17 Containment Exterior Concrete Deficiencies Identified By 1BVT 1.47.1	03/15/06
	Unit 1 Containment Type A Leak Test Results Report	04/15/06
	Unit 2 Containment Type A Leak Test Results Report	11/10/93

In comparing the elements in the applicant’s program to those in GALL AMP XI.S4, the staff found that BVPS chose Option B of Appendix J, the performance based approach, for meeting the GALL Report’s “monitoring and trending” element. However, the staff identified two issues where additional clarifications were needed to complete the review. The first issue noted by the staff was the risk impact evaluation. Since BVPS uses option B, the performance-based approach, the relaxation of Option B Integrated Leak rate test (ILRT) frequency for 15 years is based on the risk impact assessment. The second issue was that the applicant did not address how to incorporate the abovementioned liner degradation to the ILRT pretest procedure. The staff will consider issuing RAIs to address these issues, and the staff’s evaluation will be documented in the SER.

The staff also audited the operating experience reports, including a sample of condition reports, and interviewed the applicant’s technical staff to confirm that the plant-specific operating experience did not reveal any degradation not bounded by industry experience. The review indicated the most recent Unit 1 Type A test, conducted on April 14, 2006, showed a leakage rate (including the Type B and Type C Penalty Additions and Tank Change Volume Corrections) of 0.00324 %wt/day, which was below the Acceptance Criteria of 0.075 %wt/day. The most recent Unit 2 Type A test, conducted on November 10, 1993, showed a leakage rate of 0.04011 %wt/day, which was below the Acceptance Criteria of 0.075 %wt/day.

The 3 program elements, corrective actions, confirmation process, and administrative controls were audited as part of the Scoping and Screening Methodology audit. During the Aging Management Program audit, the staff compared 7 program elements in the applicant’s program and verified that these 7 elements for the AMP were consistent with those specified in GALL AMP XI.S4, except for the areas in which the staff felt additional clarification might be warranted as described above.

LRA AMP B.2.2, ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD Program

In the Beaver Valley Power Station LRA, the applicant stated that AMP B.2.2 is an existing program that is entirely consistent with the program elements in GALL AMP XI.M1, "ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD," with an exception on the Code edition that is recommended for aging management in the "scope of program," "parameters monitored or inspected," "detection of aging effects," "monitoring and trending," and "acceptance criteria," and program elements of GALL AMP XI.M1. The applicant's ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD Program is credited to manage the effects of aging in ASME Code Class 1, 2, and 3 systems and components. The applicant also credits this AMP to manage the effects of aging that are applicable to the ASME Code Class 1, 2, and 3 component supports.

During its audit, the staff audited the applicant's on-site documentation to determine whether those program elements claimed to be consistent with GALL in the applicant's AMP are consistent with the program elements recommended in GALL AMP XI.M1. The staff interviewed the applicant's technical staff and audited the following additional on-site documents and NRC-issued documents listed below:

DOCUMENT	TITLE	REVISION /DATE
FENOC Program Evaluation Document LRBV-PED-XI.M1	ASME Section XI Inservice Inspection, Subsection IWB, IWC, and IWD.	Rev. 3, 1/17/08
FENOC Program Evaluation Document LRBV-OE-001	Operating Experience Review Report	Rev. 3, 1/16/08
FENOC Program Evaluation Document LRBV-OE-002	Industry Operating Experience Review and Licensee Events	Rev. 2, 11/30/08
FENOC Procedure No. 1/2-ADM-2039	Beaver Valley Power Station Unit 1/2, BVPS ISI Ten-Year Plans	Rev. 4, 07/13/06
FENOC Procedure No. 1/2-ADM-0801	ASME Section XI Repair/Replacement Program	Rev. 5, 09/06/06
NRC Safety Evaluation	Beaver Valley Power Station, Unit Nos. 1 and 2 (BVPS-1 and 2), Risk-Informed Inservice Inspection (RI-ISI) Program (TAC Nos. MB5687 and MB5688)	04/09/04
BVPS Letter I-02-066	Beaver Valley Power Station, Unit No. 1 and No. 2, BV-1 Docket No. 50-334, License No. DPR-66, BV-2 Docket No. 50-412, License No. NPF-73, Risk-Informed Inservice Inspection Program Plans. ISI (Inservice Inspection) Program Relief Request	07/24/02
FENOC Corporate Nuclear Operating Procedure NOP-LP-2001	Corrective Action Program	Rev.15, 02/28/08

Specifically, the staff audited the program element descriptions for the “scope of program,” “preventative actions,” “parameters monitored/detected,” “detection of aging effects,” “monitoring and trending,” “acceptance criteria,” “corrective actions,” and “operating experience,” program elements in the applicant’s program against the corresponding program element descriptions that are defined and described in GALL AMP XI.M1.”

The staff’s audit of the “confirmation process,” and “administrative controls” program elements were performed as part of the staff’s audit of the quality assurance program for the LRA.

In comparing the stated 8 program elements of the applicant’s program to those in GALL AMP XI.M1, “ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD,” the staff noted that the program elements in the applicant’s AMP claimed to be consistent with the GALL Report were consistent with the corresponding program element criteria recommended in the program elements of GALL AMP XI.M1 except for two (2) topics which the staff felt were in need of additional clarification. The staff will consider issuing RAIs to address these issues, and the staff’s evaluation will be documented in the SER.

In the first topic needing additional clarification, the staff noted that the applicant had credited its current risk-informed inservice inspection (RI-ISI) program for the period of extended operation. The staff noted that that the staff’s approval of this RI-ISI program was limited only to the current 10-Year inservice inspection (ISI) intervals for the BVPS units and that RI-ISI had yet to be requested or approved for the period of extended operation. The staff’s basis for considering issuing this RAI is discussed in the SER section for this AMP.

In the second topic needing additional clarification, the staff noted that the applicant had not credited the edition of the ASME Code Section XI that is recommended for use in GALL AMP XI.M1. The staff’s basis for considering issuing this RAI is discussed in the SER section for this AMP.

The staff audited the applicants operating experience and selected reports associated with Inservice Inspection, Subsections IWB, IWC, and IWD. The staff also interviewed the applicants’s technical staff to confirm that plant-specific operating experience did not reveal any degradation outside the bounds of industry experience.

The 2 program elements, confirmation process, and administrative controls, were audited as part of the Scoping and Screening Methodology audit. During the Aging Management Program audit, the staff compared 8 program elements in the applicant’s program and verified that these 8 elements for the AMP were consistent with those specified in GALL AMP XI.M1, not including any exceptions identified by the applicant in the LRA for this AMP, which will be evaluated separately in the SER, and the areas in which the staff felt additional clarification might be warranted as described above.

LRA AMP B.2.3, ASME Section XI, Subsection IWE

In the Beaver Valley LRA, the applicant stated that BVPS AMP B.2.3 is an existing program that is consistent with GALL AMP XI.S1, "ASME Section XI, Subsection IWE" with exception.

During its audit, the staff audited the applicant's on-site documentation supporting the applicant's conclusion that the AMP elements are consistent with the elements in the GALL AMP XI.S1. The staff interviewed the applicant's technical staff and audited the following on-site documents.

DOCUMENT	TITLE	REVISION /DATE
LRBV-PED-XI.S1	ASME Section XI, Subsection IWE	Rev. 2, 06/25/07
LRVB-OE-001	Operating Experience Review Report	Rev. 3, 01/16/08
IWE-L	BVPS Unit 1 and Unit 2, "Primary Containment Inservice Inspection Program Plan,"	Rev. 0, 12/13/99
1BVT 1.47.1	Unit 1 Containment Structural Integrity Test	Rev. 9, 03/30/06
2BVT 1.47.1	Containment Structural Integrity Test	Rev. 7, 09/08/06
CR 06-01122	1R17 Containment Exterior Concrete Deficiencies Identified By 1BVT 1.47.1	3/15/06

In comparing the elements in the applicant's program to those in GALL AMP XI.S1, the staff found that an exception due to the use of ASME Section XI edition for 6 GALL elements "scope of program," "parameters monitored or inspection," "detection of aging effects," "monitoring and trending," "acceptance criteria," and "corrective actions." A generic RAI will be considered to be issued to the applicant for clarifying which Edition of the ASME Code Section XI will be credited for those AMPs that credit the ASME Code Section XI during the period of extended operation.

The staff also audited the operating experience reports, including some condition reports, and interviewed the applicant's technical staff to confirm that the plant-specific operating experience did not reveal any degradation not bounded by industry experience. The audit indicated that during refueling outage 1R17 in 2006, the temporary construction opening for Unit 1 steam generators and the reactor vessel head replacement revealed three areas of significant corrosion on the containment liner plate on the side in contact with the concrete. However, the applicant could not identify a root-cause of the corrosion. Therefore, the staff identified three issues where additional clarifications were needed to complete the review. The first issue was the possibility and severity of the similar corrosion at other locations in Unit 1 and Unit 2. The second issue was the effectiveness of the modified test procedure after refueling outage 1R17 for detecting the similar corrosion found during refueling outage 1R17. The last issue was whether the refueling outage 1R17 liner corrosion finding had led to an augmented inspection under the BVPS IWE Program. The staff will consider issuing RAIs to address these issues, and the staff's evaluation will be documented in the SER.

The 2 program elements, confirmation process, and administrative controls, were audited as part of the Scoping and Screening Methodology audit. During the Aging Management Program audit, the staff compared 8 program elements in the applicant's program

and verified that these 8 elements for the AMP were consistent with those specified in GALL AMP XI.S1, not including any exceptions identified by the applicant in the LRA for this AMP, which will be evaluated separately in the SER, and the areas in which the staff felt additional clarification might be warranted as described above.

LRA AMP B.2.4, ASME Section XI, Subsection IWF

In the Beaver Valley LRA, the applicant stated that BVPS AMP B.2.4 is an existing program that is consistent with GALL AMP XI.S3, "ASME Section XI, Subsection IWF" with exception.

During its audit, the staff audited the applicant's on-site documentation supporting the applicant's conclusion that the AMP elements are consistent with the elements in the GALL AMP XI.S3. The staff interviewed the applicant's technical staff and audited the following on-site documents.

DOCUMENT	TITLE	REVISION /DATE
LRBV-PED-XI.S3	BVPS ASME Section XI, Subsection IWF Program	Rev. 3, 07/30/07
LRVB-OE-001	Operating Experience Review Report	Rev. 3, 01/16/08
1/2-ADM-2039	BVPS ISI Ten-Year Plans	Rev. 4, 07/13/06
2R10 90 Day ISI Report	Unit 2 ISI examinations for Class 1, 2, 3 and MC components	Fall 2003
1R17 90 Day ISI Report	Unit 1 ISI examinations for Class 1, 2, 3 and MC components	Spring 2006

In comparing the elements in the applicant's program to those in GALL AMP XI.S3, the staff found that an exception due to the use of ASME Section XI edition for 6 GALL elements "Scope of Program," "Parameters Monitored or Inspection," "Detection of Aging Effects," "Monitoring and Trending," "Acceptance Criteria," and "Corrective Actions." A generic RAI will be considered to be issued to the applicant to clarify which Edition of the ASME Code Section XI will be credited for those AMPs that credit the ASME Code Section XI during the period of extended operation.

The staff also found that the BVPS chose alternate rules for examination, ASME Code Case N-491, for meeting the GALL Report "Program Description." However, in the "Operating Experience" element, an IWF table of ASME Section XI, Subsection IWF, 1989 edition was used. The staff will consider issuing a RAI to address this issue, and the staff's evaluation will be documented in the SER.

The staff also audited the operating experience reports, including some condition reports, and interviewed the applicant's technical staff to confirm that the plant-specific operating experience did not reveal any degradation not bounded by industry experience. The condition reports documented instances of pipe support degradation. The applicant determined the causes included supports being exposed to standing water, and being exposed to moisture via pipe leaks or pipe condensation. The applicant's identification and resolution of these issues provides reasonable assurance that the program effectively manages aging for component supports. During refueling outage 1R17 in 2006, the applicant performed Unit 1 ISI examinations on Class 1, 2, 3 and MC components. Class 1 exams (VT-3 visual exams for pipe and vessel supports), Class 2 exams (supports-visual), and visual exams of Class 3 supports were performed as part of this inspection. There were no recorded ISI non-destructive examination deficiencies in refueling outage 1R17. During the 2R10 refueling outage in 2003, the applicant performed Unit 2 ISI examinations on Class 1, 2, and MC components. Class 2 exams were also performed. The applicant found no ISI non-destructive examination deficiencies in refueling outage 2R10.

The 2 program elements, corrective action, confirmation process, and administrative controls, were audited as part of the Scoping and Screening Methodology audit. During the Aging Management Program audit, the staff compared 8 program elements in the applicant's program and verified that these 8 elements for the AMP were consistent with those specified in GALL AMP XI.S3, not including any exceptions identified by the applicant in the LRA for this AMP, which will be evaluated separately in the SER, and the areas in which the staff felt additional clarification might be warranted as described above.

LRA AMP B.2.5, ASME Section XI, Subsection IWL

In the Beaver Valley LRA, the applicant stated that BVPS AMP B.2.5 is an existing program that is consistent with GALL AMP XI.S2, "ASME Section XI, Subsection IWL."

During its audit, the staff audited the applicant's on-site documentation supporting the applicant's conclusion that the AMP elements are consistent with the elements in the GALL AMP XI.S2. The staff interviewed the applicant's technical staff and audited the following on-site documents.

DOCUMENT	TITLE	REVISION /DATE
LRBV-PED-XI.S2	ASME Section XI, Subsection IWL	Rev. 5, 01/16/08
LRVB-OE-001	Operating Experience Review Report	Rev. 3, 01/16/08
1/2-ADM-0801	ASME Section XI, Repair/Replacement Program	Rev. 5, 09/06/06
LRBV-CAMR-101	Equipment Hatch Platform and Reactor Containment Building, Unit 1	Rev. 2, 07/17/07
LRBV-CAMR-201	Equipment Hatch Platform and Reactor Containment Building, Unit 2	Rev. 2, 07/17/07
NDE-VT-512	Visual Examination of Concrete Containment Buildings	Rev. 3, 09/21/07
CRs: 06-8067, 01-06842, 01-04646, and 01-4645	IWL Summary report 1R17 & 2R10	2006

In comparing the elements in the applicant's program, the staff verified that the program elements contained in Beaver Valley AMP B.2.5 are consistent with GALL AMP XI.S2 program elements.

The staff also audited the operating experience reports, including some condition reports, and interviewed the applicant's technical staff to confirm that the plant-specific operating experience did not reveal any degradation not bounded by industry experience. The applicant performed its most recent containment structure IWL inspections during refueling outages 1R17 and 2R10 in 2006. The applicant's inspection results confirmed the physical condition of the concrete for Unit 1 and Unit 2 containment structures was satisfactory. The applicant identified no non-conformities, unusual wear, or damage observed in the exterior concrete at either unit.

The 3 program elements, corrective actions, confirmation process and administrative controls were audited as part of the Scoping and Screening Methodology audit. During the Aging Management Program audit, the staff compared 7 program elements in the applicant's program and verified that these 7 elements for the AMP were consistent with those specified in GALL AMP XI.S2.

LRA AMP B.2.6, Bolting Integrity

In the Beaver Valley LRA, the applicant stated that BVPS AMP B.2.6 is an existing program that is consistent with GALL AMP XI.M18, "Bolting Integrity."

During its audit, the staff audited the applicant's on-site documentation supporting the applicant's conclusion that the program elements are consistent with the elements in the GALL AMP. The staff interviewed the applicant's technical staff and audited the following on-site documents.

DOCUMENT	TITLE	REVISION / DATE
LRBV-PED-XI.M18	"Beaver Valley Power Station (BVPS) Bolting Integrity Program"	Rev. 2, 7/5/07
PROPOSED ½-ADM-[XI.M18]	"Bolting Integrity Program"	Proposed
PIPS M08.3	"Category I, II, III and F bolting Program"	Rev. 3, 12/29/98
LRBV-AMPB-001	"Aging Management Program Common Information"	Rev. 1, 7/9/07
EPRI-1002950	"Aging Effects for Structures and Structural Components (Structural Tools), Rev 1"	Rev. 1, 8/03
LRBV-OE-001	"Operating Experience Review Report"	Rev. 3, 1/16/08

In comparing the elements in the applicant's program to those in GALL AMP XI.M18, the staff found that the GALL Report "monitoring and trending" program element recommending leak rate to be monitored on a particularly defined schedule was not properly documented in the applicant's bolting integrity program. Additionally, the staff found that although the BVPS LRA claimed that the B.2.6 Bolting Integrity AMP was consistent with the GALL AMP, in the applicant's basis documents there appeared to be an exception to the GALL Report "parameters monitored/inspected" program element related to crack monitoring of high strength bolts (actual yield strength \geq 150 ksi) used in Nuclear Steam Supply System (NSSS) component supports. The staff will consider issuing RAIs to address these issues, and the staff's evaluation will be documented in the SER.

The staff also audited the operating experience reports, including a sample of condition reports, and interviewed the applicant's technical staff to confirm that the plant-specific operating experience did not reveal any degradation not bounded by industry experience. A condition report indicated that in 2002, during a VT-1 visual inspection of reactor coolant pump flange bolts, the condition of a bolt was determined to be unsatisfactory. The specific condition the applicant observed was blistering of the bolt coating in the mid-shank area between the head and threads. The threads were also noted to be lightly rusted, and the bolt was replaced. Upon further staff questioning of the BVPS staff and review of the CR, it was learned that the applicant performed additional investigation to verify the integrity of the remaining flange bolts. As a result, 3 bolts were replaced in total, and proper corrective actions were demonstrated.

The 3 program elements, corrective actions, confirmation process, and administrative controls, were audited as part of the Scoping and Screening Methodology audit.

During the Aging Management Program audit, the staff compared 7 program elements in the applicant's program and verified that these 7 elements for the AMP were consistent with those specified in GALL AMP XI.M18, except for the areas in which the staff felt additional clarification might be warranted as described above.

LRA AMP B.2.7, Boric Acid Corrosion Program

In the LRA, the applicant stated that AMP B.2.7 is an existing program that is consistent with GALL AMP XI.M10, "Boric Acid Corrosion."

During its audit, the staff audited the applicant's on-site documentation supporting the applicant's conclusion that the program elements are consistent with the elements in the GALL AMP. The staff interviewed the applicant's technical staff and audited the following on-site documents.

DOCUMENT	TITLE	REVISION /DATE
LRBV-PED-XI.M10	Boric Acid Corrosion Program Evaluation document	Rev. 5, 01/18/08
NOP-ER-2001	Boric Acid Corrosion Control Program	Rev. 6, 02/02/07
CR 03-09455	Valve encrusted with dry boric acid	09/14/03
CR 06-04426	Boric acid identified during walk down of primary system	07/24/06
L-03-138	Applicant response NRC Bulletin 2003-02	09/19/03
L-02-095	Applicant response NRC Bulletin 2002-02	09/11/02

In comparing the elements in the applicant's AMP to those in GALL AMP XI.M10, the staff found that the applicant did not identify whether all the components, including all Class 1 nickel alloy locations as per the NRC Order EA-03-009, Bulletins 2003-02 and 2004-01 were included in the scope of this program. The staff will consider issuing a RAI to address this issue, and the staff's evaluation will be documented in the SER.

The staff also audited the operating experience reports, including a sample of condition reports, and interviewed the applicant's technical staff to confirm that the plant-specific operating experience did not reveal any degradation not bounded by industry experience.

The 3 program elements, corrective actions, confirmation process and administrative controls were audited as part of the Scoping and Screening Methodology audit. During the Aging Management Program audit, the staff compared 7 program elements in the applicant's program and verified that these 7 elements for the AMP were consistent with those specified in GALL AMP XI.M10, except for the areas in which the staff felt additional clarification might be warranted as described above.

LRA AMP B.2.8, Buried Piping and Tanks Inspection

In the BVPS LRA, the applicant stated that LRA AMP B.2.8 is a new program that is consistent with GALL AMP XI.M34, “Buried Piping and Tanks Inspection.”

During its audit, the staff audited the applicant’s on-site documentation supporting the applicant’s conclusion that the program elements are consistent with the elements in the GALL report. The staff interviewed the applicant’s technical staff and audited the following on-site documents listed.

DOCUMENT NUMBER	TITLE	REVISION/DATE
LRBV-MAMR-022	“Aging Management Review of the Condensate System”	Vol. 1 & 2, Rev. 5, 06/22/07
LRBV-MAMR-24B	“Aging Management Review of the Feedwater System	Rev. 6, 08/03/07
LRBV-MAMR-030-1	“Aging Management Review of the River Water System	Rev 5, 06/22/07
LRBV-MAMR-030-2	“Aging Management Review of the Service Water System	Rev 5, 06/22/07
LRBV-MAMR-032	“Aging Management Review of the Water Treating System	Vol. 1 & 2, Rev. 5, 08/03/07
LRBV-MAMR-033	“Aging Management Review of the Fire Protection System	Rev 5, 06/22/07
LRBV-MAMR-36A	“Aging Management Review of the Diesel Generator System	Rev 6, 07/20/07
LRBV-MAMR-45F	“Aging Management Review of the Security Diesel Generator System	Rev 5, 06/22/07
LRBV-PED-XI.M34	Buried Piping and Tanks Inspection Vol. 1	Rev. 7, 08/09/07
LRBV-PED-XI.M34	Buried Piping and Tanks Inspection Vol. 2	Rev. 7, 08/09/07

In comparing the elements in the applicant’s program to those in GALL AMP XI.M34, the staff found that the applicant had addressed all elements in a satisfactory manner. In addition, the elements were consistent with the GALL Report.

The staff also audited the operating experience, including a sample of condition reports, and interviewed the applicant’s technical staff to confirm that the plant-specific operating experience did not reveal any degradation not bounded by industry experience. In the application, the applicant stated that there is no operating experience with the effectiveness of the program because it is a new program. In order to be consistent with the staff’s recommendations in Section A.1.2.3.10, item 2 of SRP-LR Branch Position RLSB-1 (i.e. Branch Position RLSB-1 of Appendix A to NUREG-1800), the staff will consider issuing an RAI requesting that the applicant provide a commitment in the application to submit future operating experience on this AMP to the staff in order to confirm the effectiveness of this program. This RAI will also consider requesting the applicant to discuss and submit any observed material degradation found during the implementation of other existing activities that relate to the aging effects that will be managed by the new program. This RAI will be evaluated and documented in the SER.

The 3 program elements, corrective actions, confirmation process, and administrative controls, were audited as part of the Scoping and Screening Methodology audit. During the Aging Management Program audit, the staff compared 7 program elements in the applicant's program and verified that these 7 elements for the AMP were consistent with those specified in GALL AMP XI.M34, except for the areas in which the staff felt additional clarification might be warranted as described above.

LRA AMP B.2.9, Closed-Cycle Cooling Water System

In the LRA, the applicant stated that AMP B.2.9 is an existing program that, following enhancements, will be consistent with GALL AMP XI.M21, "Closed-Cycle Cooling Water System."

During its audit, the staff audited the applicant's on-site documentation supporting the applicant's conclusion that the program elements are consistent with the elements in the GALL AMP. The staff interviewed the applicant's technical staff and audited the following on-site documents.

DOCUMENT	TITLE	REVISION /DATE
LRBV-PED-XI.M21	Beaver Valley Power Station Closed-Cycle Cooling Water Program (Unit 1 and Unit 2)	Rev. 4, 07/30/07
Enhanced 1/2-ADM-1738	Closed Loop and River Water System Monitoring Program	Rev. 2, 09/20/06
LRBV-OE-001	CR 06-02674/Biofouling	Rev. 3, 01/16/08
LRBV-OE-001	CR 05-07400/Component cooling water chemistry out of tolerance	Rev. 3, 01/16/08

In comparing the elements in the applicant's AMP to those in GALL AMP XI.M21, the staff found that the applicant has taken enhancements as follows:

1. Added components (diesel-driven fire pump Unit 1 only and diesel-driven standby air compressor Unit 2 only) to the Closed-Cycle Cooling Water System Program under the "Scope of Program." The staff noticed that the systems crediting the Closed-Cycle Cooling Water System identified by the applicant were not complete as compared with the AMR Tables. Therefore, the staff will consider issuing a RAI to address this issue.
2. Added detail to procedures providing direction in the performance of visual inspections of system components and performance testing of heat exchangers and pumps under "Parameters Monitored/Inspected." The staff noticed that although the diesel-driven fire pump and diesel-driven standby air compressor were added to the Closed-Cycle Cooling Water System Program, no instrumentation exists for performance testing. Therefore, the staff will consider issuing a RAI to address this issue.
3. Added parameters to "Detection of Aging Effects" specifying parameters that will be trended to determine whether heat exchanger tube fouling or corrosion product buildup exists.
4. Added requirements to specify visual inspection test frequency to "Monitor and Trending."

The Operating Experience explains that EDG Jacket Water system bolting for the temperature control valves may be subject to unexpected corrosion; however, there are no AMR lines for bolting credited with this program. The staff will consider issuing a RAI to address this issue, and the staff's evaluation will be documented in the SER.

The 3 program elements, corrective actions, confirmation process and administrative controls were audited as part of the Scoping and Screening Methodology audit. During the Aging Management Program audit, the staff compared 7 program elements in the applicant's program and verified that these 7 elements for the AMP were consistent with those specified in GALL AMP XI.M21, except for the areas in which the staff felt additional clarification might be warranted as described above.

LRA AMP B.2.11, Electrical Cable and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements

In the Beaver Valley LRA, the applicant stated that BVPS AMP B.2.11 is a new program that is consistent with GALL AMP XI.E1, “Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements.”

During its audit, the staff audited the applicant’s claim of consistency with the GALL AMP. Specifically, the staff interviewed the applicant’s technical staff and audited the following documents:

DOCUMENT	TITLE	REVISION /DATE
LRBV-PED-XI.E1	Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Program Evaluation Document	Rev. 3, 07/23/07
LRBV-PED-XI.E1	Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements References	Rev. 3, 07/23/07
LRBV-EAMR-001	BVPS License Renewal Project Document	Rev. 5, 11/30/07

In comparing the elements in the applicant’s program, the staff verified that the program elements contained in Beaver Valley AMP B.2.11 are consistent with GALL AMP XI.E1 program elements. The staff confirmed that the boundary conditions of the plant program are enveloped by the boundary conditions described in the GALL AMP. The staff also verified that the applicant provided an adequate summary description of the program.

The staff audited the LRV-EAMR-001, Revision 5, where the threshold temperature and radiation level for localize environment is defined. The applicant representative clarified the sample process for inspecting cables and connections located in adverse localized environments. The staff verified the technical information and guidance identified in GALL AMP XI.E1 were presented in Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements References LRBV-PED-XI.E1. The LRA states that AMP B.2.11 is a new program for which there is no plant-specific program operating experience. In order to be consistent with the staff’s recommendations in Section A.1.2.3.10, item 2 of SRP-LR Branch Position RLSB-1 (i.e. Branch Position RLSB-1 of Appendix A to NUREG-1800), the staff will consider issuing an RAI requesting that the applicant provide a commitment in the application to submit future operating experience on this AMP to the staff in order to confirm the effectiveness of this program. This RAI will also consider requesting the applicant to discuss and submit any observed material degradation found during the implementation of other existing activities that relate to the aging effects that will be managed by the new program. This RAI will be evaluated and documented in the SER.

The 3 program elements, corrective actions, confirmation process, and administrative controls, were audited as part of the Scoping and Screening Methodology audit. During the Aging Management Program audit, the staff compared 7 program elements in the applicant’s program and verified that these 7 elements for the AMP were consistent with those specified in GALL AMP XI.E1, except for the areas in which the staff felt additional clarification might be warranted as described above.

LRA AMP B.2.12, Electrical Cable and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Used in Instrumentation Circuits

In the Beaver Valley LRA, the applicant stated that BVPS AMP B.2.12 is a new program that is consistent with GALL AMP XI.E2, “Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Used in Instrumentation Circuits.”

During its audit, the staff audited the applicant’s claim of consistency with the GALL AMP. Specifically, the staff interviewed the applicant’s technical staff and audited the following documents:

DOCUMENT	TITLE	REVISION / DATE
LRBV-PED-XI.E2	Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Used in Instrumentation Circuit Program Evaluation Document	Rev. 4, 01/31/08
LRBV-PED-XI.E2	Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Used in Instrumentation Circuit References	Rev. 4, 01/31/08
LRBV-EAMR-001	BVPS License Renewal Project Document	Rev. 5, 11/30/07

The staff verified the program elements contained in Beaver Valley AMP B.2.12 are consistent with GALL AMP XI.E2 program elements. The staff confirmed that the boundary conditions of the plant program are enveloped by the boundary conditions described in the GALL AMP. The staff also verified that the applicant provided an adequate summary description of the program.

Beaver Valley AMP B.2.12, “Electrical Cable and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Used in Instrumentation Circuits,” states that this program includes high-range radiation monitors and excore nuclear instrumentation circuits. GALL AMP XI.E2 applies to high-range radiation monitors and neutron flux monitoring instrumentation cables. The staff audited BVPS License Renewal Project Document, LRBV-EAMR-001 and verified that excore nuclear instrumentation (source range, intermediate range, and power range) are the same as neutron flux monitoring instrumentation cable.

The LRA states that AMP B.2.12 is a new program for which there is no plant-specific program operating experience. In order to be consistent with the staff’s recommendations in Section A.1.2.3.10, item 2 of SRP-LR Branch Position RLSB-1 (i.e. Branch Position RLSB-1 of Appendix A to NUREG-1800), the staff will consider issuing an RAI requesting that the applicant provide a commitment in the application to submit future operating experience on this AMP to the staff in order to confirm the effectiveness of this program. This RAI will also consider requesting the applicant to discuss and submit any observed material degradation found during the implementation of other existing activities that relate to the aging effects that will be managed by the new program. This RAI will be evaluated and documented in the SER.

The 3 program elements, corrective actions, confirmation process, and administrative controls, were audited as part of the Scoping and Screening Methodology audit. During the Aging

Management Program audit, the staff compared 7 program elements in the applicant's program and verified that these 7 elements for the AMP were consistent with those specified in GALL AMP XI.E2, not including any exceptions identified by the applicant in the LRA for this AMP, which will be evaluated separately in the SER, and the areas in which the staff felt additional clarification might be warranted as described above.

LRA AMP B.2.14, Environmental Qualification of Electric Component Program

In the Beaver Valley LRA, the applicant stated that BVPS AMP B.2.14 is an existing program that is consistent with GALL AMP X.E1, "Environmental Qualification of Electric Components."

During its audit, the staff audited the applicant's claim of consistency with the GALL AMP. Specifically, the staff interviewed the applicant's technical staff and audited the following documents:

DOCUMENT	TITLE	REVISION /DATE
LRBV-PED-X.E1 Vol. 1	Environmental Qualification of Electrical Component Program (Unit 1 and Unit 2)	Rev. 3, 07/30/07
LRBV-PED-X.E1 Vol. 2	Environmental Qualification of Electrical Component Program References	Rev. 3, 07/30/07

In comparing the elements in the applicant's program, the staff verified that the program elements contained in BVPS AMP B.2.14 are consistent with GALL AMP X.E1 program elements. The staff confirmed that the boundary conditions of the plant program are enveloped by the boundary conditions described in the GALL AMP. The staff also verified that the applicant provided an adequate summary description of the program.

The technical information and guidance identified in GALL AMP X.E1 were presented in Environmental Qualification of Electrical Component Program LRBV-PED-X.E1 and references. Based on its audit, the staff found that the applicant did not include reanalysis attributes in the program description of BVPS AMP B.2.14 and FSAR supplement. Section 4.4 of the LRA indicates that the aging effects of the EQ of electrical equipment identified as TLAA's will be managed during the period of extended operation under 10 CFR 54.21(c)(iii). However, no information is provided in the applicant's program and FSAR supplement regarding reanalysis attributes to extend the qualified life of EQ components. Important attributes for the reanalysis of an aging evaluation include analytical methods, data collection and reduction methods, underlying assumptions, acceptance criteria, and corrective actions (if acceptance criteria are not met). The staff will consider issuing an RAI to address this issue, and the staff's evaluation will be documented in the SER.

The applicant stated in its LRBV-PED-X.E1, Volume 1, that the Detection of Aging Affects and Monitoring and Trending program sub-element is consistent with GALL AMP X.E1 and the applicant referred to procedure 1/2-ADM-2014, Section 7.9 and 7.10. However, the staff audited this reference and found that it did not specifically address monitoring or inspection of certain environments to ensure that components are within the bounds of their qualification bases. The staff will consider issuing a RAI to address this issue, and the staff's evaluation will be documented in the SER.

The staff also audited the operating experience reports, including a sample of condition reports, and interviewed the applicant's technical staff to confirm that the plant-specific operating experience did not reveal any degradation not bounded by industry experience. The applicant performed a self-assessment in 2006 based upon industry operating experience that identified discrepancies in the information contained within the preventive maintenance (PM) database and the associated EQ program documentation. The self-assessment found that one of the 94

EQ Maintenance Assessment Packages was deficient in the PM database and would have caused the equipment to be relied upon beyond its qualified life value. A corrective action program report was generated by the applicant to correct the requirement frequency from 22 years to 20 years. This demonstrates that the current EQ program is effectively identifying problems and implementing corrective actions.

The 3 program elements, corrective actions, confirmation process and administrative controls were audited as part of the Scoping and Screening Methodology audit. During the Aging Management Program audit, the staff compared 7 program elements in the applicant's program and verified that these 7 elements for the AMP were consistent with those specified in GALL AMP X.E1, except for the areas in which the staff felt additional clarification might be warranted as described above.

LRA AMP B.2.15, External Surface Monitoring Program

In the LRA, the applicant stated that AMP B.2.15 is a new program that when implemented will be consistent with GALL AMP XI.M36, "External Surface Monitoring."

During its audit, the staff audited the applicant's on-site documentation supporting the applicant's conclusion that the program elements are consistent with the elements in the GALL AMP. The staff interviewed the applicant's technical staff and audited the following on-site documents.

DOCUMENT	TITLE	REVISION /DATE
LRBV-PED-XI.M36	External Surfaces Monitoring Program Evaluation Document	Rev. 4, 07/20/07
SPEAP-2.1	Performance of System Walk downs	Rev. 5, 05/30/01

In comparing the elements in the applicant's AMP to those in GALL AMP XI.M36, the staff found that the applicant has expanded the scope of the External Surfaces Monitoring Program beyond what the GALL AMP addresses. The GALL AMP XI.M36 is credited for managing the aging effect of loss of material due to general, pitting and crevice corrosion for steel components. The applicant states its program is consistent with the GALL AMP, however, it also manages hardening, loss of strength and cracking of elastomers; reduction of heat transfer of Emergency Response Facility diesel generator jacket water radiator fins; and loss of material for aluminum, Cast Austenitic Stainless Steel, stainless steel, copper alloy and nickel alloy components. The staff will consider issuing an RAI to address this issue, and the staff's evaluation will be documented in the SER.

The "operating experience" element states that the External Surface Monitoring Program is a new program and there is no plant-specific program operating experience. However, during performance of surveillance tests or preventive maintenance or during system walk-downs, any degradation of exterior surfaces that was observed would have been documented. In order to be consistent with the staff's recommendations in Section A.1.2.3.10, item 2 of SRP-LR Branch Position RLSB-1 (i.e. Branch Position RLSB-1 of Appendix A to NUREG-1800), the staff will consider issuing an RAI requesting that the applicant provide a commitment in the application to submit future operating experience on this AMP to the staff in order to confirm the effectiveness of this program. This RAI will also consider requesting the applicant to discuss and submit any observed material degradation found during the implementation of other existing activities that relate to the aging effects that will be managed by the new program. This RAI will be evaluated and documented in the SER.

The 3 program elements, corrective actions, confirmation process and administrative controls were audited as part of the Scoping and Screening Methodology audit. During the Aging Management Program audit, the staff compared 7 program elements in the applicant's program and verified that these 7 elements for the AMP were consistent with those specified in GALL AMP XI.M36, except for the areas in which the staff felt additional clarification might be warranted as described above.

LRA AMP B.2.16, Fire Protection Program

In the LRA, the applicant stated that AMP B.2.16 is an existing program that, following enhancement, will be consistent with GALL AMP XI.M26, "Fire Protection," with an exception.

During its audit, the staff audited the applicant's on-site documentation supporting the applicant's conclusion that the program elements are consistent with the elements in the GALL AMP. The staff interviewed the applicant's technical staff and audited the following on-site documents.

DOCUMENT	TITLE	REVISION /DATE
LRBV-PED-XI.M26	Fire Protection Program Evaluation document	Rev. 4, 02/22/08
1/2-ADM-1900	Fire Protection Program	Rev. 14, 12/29/06
CR 03-08988	Degraded fire wrap material on ductwork	09/15/04
CR 06-04450	Degraded fire seal found	07/24/06

In comparing the elements in the applicant's AMP, the staff found that the applicant has taken enhancements as follows:

1. Add into the "scope of program" element the fire protection systems that are within the scope of license renewal. The systems will also be included in the "detection of aging effects, monitoring and trending, and acceptance criteria" elements.
2. Enhance the inspection guidance to include details about fire barrier degradation

The applicant took an exception to the frequency of Halon and carbon dioxide system functional test. The GALL Report AMP recommends a frequency of once every six months whereas the applicant is using once every eighteen months. The staff will consider issuing a RAI to address this issue, and the staff's evaluation will be documented in the SER.

As part of the exception, the applicant stated that it will change the frequency of Halon and carbon dioxide system inspections to once every 6 months compared to once every eighteen months during the period of extended operation. However, the applicant did not include an enhancement or a commitment in the LRA. The staff will consider issuing a RAI to address this issue, and the staff's evaluation will be documented in the SER.

The staff also audited the operating experience reports, including a sample of condition reports, and interviewed the applicant's technical staff to confirm that the plant-specific operating experience did not reveal any degradation not bounded by industry experience.

The 3 program elements, corrective actions, confirmation process and administrative controls were audited as part of the Scoping and Screening Methodology audit. During the Aging Management Program audit, the staff compared 7 program elements in the applicant's program and verified that these 7 elements for the AMP were consistent with those specified in GALL AMP XI.M26, not including any exceptions identified by the applicant in the LRA for this AMP, which will be evaluated separately in the SER, and the areas in which the staff felt additional clarification might be warranted as described above.

LRA AMP B.2.17, Fire Water System Program

In the LRA, the applicant stated that AMP B.2.17 is an existing program that, following enhancements, will be consistent with GALL AMP XI.M27, "Fire Water System."

During its audit, the staff audited the applicant's on-site documentation supporting the applicant's conclusion that the program elements are consistent with the elements in the GALL AMP. The staff interviewed the applicant's technical staff and audited the following on-site documents.

DOCUMENT	TITLE	REVISION /DATE
LRBV-PED-XI.M27	Fire Water System Program Evaluation Document	Rev. 3, 08/08/07
1/2-ADM-1900	Fire Protection Program	Rev. 14, 12/29/06
CR 05-3940	Fire protection piping through wall leak	05/24/05
CR 06-05051	Fire protection piping through wall leak	08/27/06
CR 07-13290	Fire protection leak	01/24/07

In comparing the elements in the applicant's AMP, the staff found that the applicant has taken enhancements as follows:

1. Added a program requirement in the "parameters monitored/inspected" element to perform flow test or inspection of all accessible fire water headers
2. Added program requirements in the "detection of aging effects" element to identify locations if visual inspections are to be performed; allow test of inspection results from accessible sections of pipe to be extrapolated for inaccessible pipe; require flow testing of all accessible headers and piping; and require testing or replacement of sprinkler heads in service for 50 years.
3. The applicant also included an enhancement in the "detection of aging effects" element that states that the program enhancement described under the "scope of program" element is necessary. However, there is no enhancement identified in the "scope of program" element. The staff will consider issuing a RAI to address this issue, and the staff's evaluation will be documented in the SER.

In the fire water system program document, for evaluation of consistency with the GALL AMP, the applicant stated that Unit 1 fire hydrant gasket inspection is performed every 18 months, compared to the GALL AMP recommendation of 12 months. However, the applicant did not include this as an exception in the LRA because gaskets were considered consumables and will be replaced as necessary. The staff will consider issuing a RAI to address this issue, and the staff's evaluation will be documented in the SER.

In the fire water system program document, for evaluation of consistency with the GALL AMP, the applicant stated that fire hydrant hose hydraulic tests are performed at various frequencies different than the GALL AMP recommended frequency of once every 12 months. However, the applicant did not include this as an exception in the LRA because hoses were considered

consumables and will be replaced as necessary. The staff will consider issuing a RAI to address this issue, and the staff's evaluation will be documented in the SER.

The staff also audited the operating experience reports, including a sample of condition reports, and interviewed the applicant's technical staff to confirm that the plant-specific operating experience did not reveal any degradation not bounded by industry experience. However, the staff noticed that several CRs were generated to address pinhole leaks in fire protection piping. The applicant attributed the cause of the leaks as loss of material due to microbiologically induced corrosion (MIC). In CR 05-3940, it was determined that the chemical treatment of the piping did not eliminate MICs already established in the piping. UT inspections by the applicant confirmed areas in the piping system having a wall thickness loss of 50% or more. The staff will consider issuing a RAI to address this issue, and the staff's evaluation will be documented in the SER.

The 3 program elements, corrective actions, confirmation process and administrative controls were audited as part of the Scoping and Screening Methodology audit. During the Aging Management Program audit, the staff compared 7 program elements in the applicant's program and verified that these 7 elements for the AMP were consistent with those specified in GALL AMP XI.M27, except for the areas in which the staff felt additional clarification might be warranted as described above.

LRA AMP B.2.18, Flow-Accelerated Corrosion Program

In the LRA, the applicant stated that AMP B.2.18 is an existing program that is consistent with GALL AMP XI.M17, Flow-Accelerated Corrosion.

During its audit, the staff audited the applicant's on-site documentation to support its conclusion that the program elements are consistent with the elements in the GALL AMP. The staff interviewed the applicant's technical staff and audited the following on-site documents.

DOCUMENT	TITLE	REVISION /DATE
LRBV-PED-XI.M18	Flow Accelerated Corrosion Program Evaluation document	Rev. 4, 01/17/08
1/2-ADM-2205	Flow Accelerated Corrosion Program	Rev. 1, 10/02/06
CR 06-01195	Feedwater elbow minimum wall concern	02/22/06
NSAC-202L-R2	Recommendation for an effective flow-accelerated program	April 1999
ATR 98113-TR-01	Altran Technical Report for FAC Program system susceptibility screening for Beaver Valley	July 1998

The staff reviewed the flow-accelerated corrosion program document and the ALTRAN Technical Report to confirm that appropriate susceptibility screening of systems was performed. The applicant uses CHECKWORKS as a predictive code. The staff also reviewed some inspection results to confirm the correlation between the predicted wall thickness and the actual measured wall thickness.

The staff also audited the operating experience reports, including a sample of condition reports, and interviewed the applicant's technical staff to confirm that the plant-specific operating experience did not reveal any degradation not bounded by industry experience. The staff reviewed the results of the last two refueling outages and the corrective actions taken by the applicant.

The 3 program elements, corrective actions, confirmation process and administrative controls were audited as part of the Scoping and Screening Methodology audit. During the Aging Management Program audit, the staff compared 7 remaining program elements in the applicant's program and verified that these 7 elements for the AMP were consistent with those recommended in GALL AMP XI.M17.

LRA AMP B.2.19, Flux Thimble Tube Inspection

In the Beaver Valley LRA, the applicant stated that BVPS AMP B.2.19 is an existing program that is consistent with GALL AMP XI.M37 "Flux Thimble Tube Inspection" with an enhancement. The enhancement included corrective actions which would require removal of a thimble tube from service if it cannot be inspected over the tube length.

During its audit, the staff audited the applicant's on-site documentation supporting the applicant's conclusion that the program elements are consistent with the elements in the GALL AMP. The staff interviewed the applicant's technical staff and audited the following on-site documents.

DOCUMENT	TITLE	REVISION / DATE
LRBV-PED-XI.M37	"BVPS Flux Thimble Tube Inspection Program (Unit 1 and Unit 2)"	Rev. 3, 6/19/07
ISIE-ECP-3	"Flux Thimble Tube Examination Program"	Rev. 5, 8/22/05
Letter	"BVPS Response to NRC Bulletin 88-09 (Unit 1 flux thimble tube inspection)"	11/03/88
Letter	"BVPS follow-up response to NRC Bulletin 88-09 (Unit 2 flux thimble tube inspection)"	04/24/89
Letter	"NRC Acknowledgement of BVPS Response to Bulletin 88-09"	08/01/89
WCAP-12866	"Bottom Mounted Instrumentation Flux Thimble Wear"	01/91
LRBV-OE-001	"Operating Experience Review Report"	Rev. 3, 01/16/08

In comparing the elements in the applicant's program, the staff found that the GALL Report "parameters monitored/ inspected" and "detection of aging effects" program elements which require a wear limit, were stated to be satisfied by BVPS through its response to NRC Bulletin 88-09 in letter "BVPS Response to NRC Bulletin 88-09 (Unit 1 flux thimble tube inspection)" dated November 3, 1988 and "BVPS follow-up response to NRC Bulletin 88-09 (Unit 2 flux thimble tube inspection)," dated April 24, 1989. The NRC acknowledged these responses in a letter dated August 1, 1989. However, since then the BVPS flux thimble tube wear limit has changed to a less conservative value. Documentation of approval of this change was not readily available for examination. The staff will consider issuing a RAI to address this issue, and the staff's evaluation will be documented in the SER.

The staff also audited the operating experience reports and interviewed the applicant's technical staff to confirm that the plant-specific operating experience did not reveal any degradation not bounded by industry experience. The reports indicated that in 2003, during refueling outage 1R15, several flux thimble tubes which were replaced during refueling outage 1R13 displayed elevated wall thinning. Of those with significant wall thinning, only two tubes were projected to exceed the BVPS 70% threshold for wall thinning. When questioned about the elevated wall thinning, the applicant stated that this initial elevated wear was explained as an initial wear in period, after which wear rates would significantly slow down. However, the applicant could not readily supply the specific wall thicknesses measured or how they used industry experience to come to its conclusion that it is acceptable. The staff will consider issuing an RAI to address this issue, and the staff's evaluation will be documented in the SER.

The 3 program elements, corrective actions, confirmation process and administrative controls were audited as part of the Scoping and Screening Methodology audit. During the Aging Management Program audit, the staff compared 7 program elements in the applicant's program and verified that these 7 elements for the AMP were consistent with those specified in GALL AMP XI.M37, except for the areas in which the staff felt additional clarification might be warranted as described above.

LRA AMP B2.20, Fuel Oil Chemistry

In the LRA, the applicant stated that AMP B2.20 is an existing program that, following enhancement, will be consistent with GALL AMP XI.M30, Fuel Oil Chemistry System.

During its audit the staff audited the applicant's on-site documentation to support its conclusion that the program elements are consistent with the elements in the GALL AMP. The staff interviewed the applicant's technical staff and audited the following on-site documents.

Document Number	Title	Revision and/or Date
1. LRBV-PED-XI.M30	Beaver Valley Power Station Fuel Oil Chemistry Program (Unit 1 and Unit 2)	Rev. 4, 02/01/08
2. Proposed 1/2-ADM-[XI.M30]	Fuel Oil Chemistry Program	Rev. 0
3. LRBV-OE-001	CR 02-02591/Particulates	Rev. 3, 1/16/08
4. LRBV-OE-001	CR 05-01616/Water in Fuel Oil	Rev. 3, 1/16/08
5. LRBV-OE-001	CR 02-11357/Problems in EDG FO	Rev. 3, 1/16/08

In comparing the elements in the applicant's AMP, the staff found that the applicant has taken enhancements as follows:

1. Add into the "Parameters Monitored/Inspected" element, revised procedures for sampling and testing the diesel-driven fire pump fuel oil storage tank (Unit 1) which includes a particulate and accumulated water test. Additionally, a new implementing procedure will be issued that describes sampling and testing the security diesel generator fuel oil day tank (Common) for accumulated water, particulate contamination, and sediment/water.
2. The "Detection of Aging Effects" describe that the enhancements under "Parameters Monitored/Inspected" element bring the Fuel Oil Chemistry Program into consistency with the GALL AMP.
3. The "Detection of Aging Effects" describe that implementing procedures will be revised to perform UT thickness measurements of accessible above-ground fuel oil tank bottoms at the same frequency as tank cleaning and inspections to ensure that significant degradation is not occurring.

The staff reviewed the enhancements and compared the changes with the GALL AMP XI.M30 recommendations for the enhanced elements. The staff determined that implementation of these enhancements will make the applicant's Fuel Oil Chemistry program consistent with the GALL AMP XI.M30. On this basis, the staff finds the enhancements acceptable.

The Operating Experience reports including a sample of condition reports, and interviews with the applicant's technical staff confirm that the plant-specific operating experience did not reveal any degradation not bounded by industry experience. Condition Report 02-11357, "Problem (in fuel oil) following the 24 hour run of the 2-2 Emergency Diesel Generator," and Corrective Actions #21 & #39 Condition Report 02-02591, "EE-TK-6 Total Particulate Contamination Exceeds Limits," Corrective Action #2, were reviewed. These CRs identified out of specification particulates in fuel oil. The corrective actions were documented the report that included filtering and sampling the fuel oil to restore parameters to specifications.

The 3 program elements, corrective actions, confirmation process and administrative controls were audited as part of the Scoping and Screening Methodology audit. During the Aging Management Program audit, the staff compared 7 program elements in the applicant's program and verified that these 7 elements for the AMP were consistent with those specified in GALL AMP XI.M30, except for the areas in which the staff felt additional clarification might be warranted as described above.

LRA AMP B.2.21, Inaccessible Medium-Voltage Cables Not Subject To 10 CFR 50.49 Environmental Qualification Requirements

In the Beaver Valley LRA, the applicant stated that BVPS AMP B.2.21 is a new program that is consistent with GALL AMP XI.E3, "Inaccessible Medium-Voltage Cables not Subject to 10 CFR 50.49 Environmental Qualification Requirement."

During its audit, the staff audited the applicant's claim of consistency with the GALL AMP. Specifically, the staff interviewed the applicant's technical staff and audited the following documents:

DOCUMENT	TITLE	REVISION /DATE
LRBV-PED-XI.E3	Inaccessible Medium-Voltage Cables not Subject to 10CFR50.49 Environmental Qualification Requirements	Rev. 3, 07/23/07
LRBV-PED-XI.E3	Inaccessible Medium-Voltage Cables not Subject to 10CFR50.49 Environmental Qualification Requirements References	Rev. 3, 07/23/07
LRBV-EAMR-001	BVPS License Renewal Project Document	Rev. 5, 11/30/07
LRBV-OE-01	Operating Experience	Rev. 3

In comparing the elements in the applicant's program, the staff verified that the program elements contained in Beaver Valley AMP B.2.21 are consistent with GALL AMP XI.E3 program elements. The staff confirmed that the boundary conditions of the plant program are enveloped by the boundary conditions described in the GALL AMP. The staff also verified that the applicant provided an adequate summary description of the program.

The technical information and guidance identified in GALL AMP XI.E3 were presented in Inaccessible Medium-Voltage Cable Not Subject to 10 CFR 50.49 Environmental Qualification Requirement LRBV-PED-XI.E3 and references. In comparing the elements in the applicant's program, the staff found that the applicant did not define significant moisture and significant voltage in the scope of AMP B.2.21. The staff will consider issuing an RAI to address this issue, and the staff's evaluation will be documented in the SER.

GALL AMP XI.E3 identified NUREG/CR-5643, IEEE Std. P1205, SAND96-0344, EPRI TR-109619, and EPRI TR-103834-P1-2 as the technical basis and guidance in GALL XI.E3. The applicant states that Beaver Valley B.2.21 is consistent with GALL AMP XI.E3 but it did not identify these documents as the basis for its AMP. The staff will consider issuing an RAI to address this issue, and the staff's evaluation will be documented in the SER.

The staff audited operating experience reports, including a sample of condition reports, and interviewed the applicant's technical staff to confirm that the plant-specific operating experience did not reveal any degradation not bounded by industry experience. In LRA Section B.2.21, under operating experience, the applicant states that it currently has a manhole inspection program which identified and evaluated water collection in the manholes. The applicant stated that this prevention program has been effective in monitoring and evaluating the exposure of water to cable and cable supports located in manholes.

The staff audited operating experience LRBV-OE-01, Revision 3, and noted that in Corrective Report (CR) 04-03545 the applicant discovered that the Manhole 1EMH-19A Duct 944 had 34 inches of water in it during performance of a manhole inspection for water induced damage in 2004. The water was removed; however, the lower cable tray was severely deteriorated to the point where one of the ladder rungs of the tray had fallen out and the tray support brackets were also badly rusted. The BVPS manhole inspection was last performed by the applicant in September 2006. The findings from that inspection included missing seals, cracked walls, corroded supports, and water intrusion, but no cable damage was found. In reviewing the CR, the staff noted that certain manholes had chronic flooding problems. These manholes, numbered 1EMH-8A, 8B, and 15, are located below grade near the intake structure and repeatedly had water levels of 10 to 15 feet. Manholes 1EMH - 8A&8B contain safety related cables from both Units 1 and 2. The staff questioned the adequacy of the applicant's corrective actions and periodic inspection for water collection in the manholes. The staff will consider issuing a RAI to address this issue, and the staff's evaluation will be documented in the SER.

The 3 program elements, corrective actions, confirmation process and administrative controls were audited as part of the Scoping and Screening Methodology audit. During the Aging Management Program audit, the staff compared 7 program elements in the applicant's program and verified that these 7 elements for the AMP were consistent with those specified in GALL AMP XI.E3, except for the areas in which the staff felt additional clarification might be warranted as described above.

LRA AMP B.2.22, Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components Program

In the LRA, the applicant stated that AMP B.2.22 is a new program that when implemented will be consistent with GALL AMP XI.M38, Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components.

During its audit, the staff audited the applicant’s on-site documentation supporting the applicant’s conclusion that the program elements are consistent with the elements in the GALL AMP. The staff interviewed the applicant’s technical staff and audited the following on-site documents.

DOCUMENT	TITLE	REVISION /DATE
LRBV-PED-XI.M38	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components Program Evaluation Document	Rev. 3, 07/26/07
Proposed 1/2-ADM-[XI.M38]	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components Program	Draft
CR 02-09358	Spray nozzle corrosion	10/19/02
CR 06-8110	Service water system valve loss of material	10/16/06

In comparing the elements in the applicant’s AMP, the staff found that the “acceptance criteria” element states that the program will inspect for indications of material degradation such as corrosion, cracking, fouling, etc. and that inspection results not meeting the acceptance criteria will be processed in accordance with the corrective action program. However, the acceptance criteria are not defined. The staff will consider issuing a RAI to address this issue, and the staff’s evaluation will be documented in the SER.

The staff also audited the operating experience reports, including a sample of condition reports, and interviewed the applicant’s technical staff to confirm that the plant-specific operating experience did not reveal any degradation not bounded by industry experience.

The 3 program elements, corrective actions, confirmation process and administrative controls were audited as part of the Scoping and Screening Methodology audit. During the Aging Management Program audit, the staff compared 7 program elements in the applicant’s program and verified that these 7 elements for the AMP were consistent with those specified in GALL AMP XI.M38, except for the areas in which the staff felt additional clarification might be warranted as described above.

LRA AMP B.2.23, Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems

In the Beaver Valley LRA, the applicant stated that BVPS AMP B.2.23 is an existing program that is consistent with GALL AMP XI.M23, "Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems," with an enhancement. The enhancement includes guidance in licensee procedures to inspect for loss of material due to corrosion on certain crane components.

During its audit, the staff audited the applicant's on-site documentation supporting the applicant's conclusion that the AMP elements are consistent with the elements in the GALL AMP. The staff interviewed the applicant's technical staff and audited the following on-site documents.

DOCUMENT	TITLE	REVISION / DATE
LRBV-PED-XI.M23	"BVPS Inspection of Overhead Heavy Load and Light Load (Related to refueling) Handling Systems Program – Program Evaluation Document"	Rev. 2, 7/3/07
1/2-ADM-0800	"Site Load Handling & Rigging Program"	Rev. 3, 1/24/06
1/2 -ADM-0819	"Handling of NUREG 0612 Heavy Loads"	Rev. 5, 3/24/06
CR 03-01127	"RFA-Engineering Investigate 10 CFR21 Notification – Whiting Corporation"	2/1/03
LRBV-OE-001	"Operating Experience Review Report"	Rev. 3, 1/16/08

In comparing the elements in the applicant's program to those in GALL AMP XI.M23, the staff found that BVPS credited its Maintenance Rule Program for meeting the GALL Report "parameters monitored/ inspected" program element by evaluating the effectiveness of the crane maintenance monitoring program and the effects of past and future usage on the structural reliability of cranes and hoists. However, no reference to the Maintenance Rule Program was found in LRBV-PED-XI.M23. Therefore, the staff will consider issuing a RAI to address this issue, and the staff's evaluation will be documented in the SER.

The staff also audited the operating experience reports, including a sample of condition reports, and interviewed the applicant's technical staff to confirm that the plant-specific operating experience did not reveal any degradation not bounded by industry experience. The applicant's reports indicate that, in 2003, an event occurred in the Waste Handling Building when programmatic deficiencies and degraded crane material conditions related to a lift of a high integrity container grapple necessitated a stop work order for radiological lifts. However, additional details were not readily apparent regarding the event, most notably the resulting enhancements that were driven by this event. A lack of response by its monitoring program would bring into question the applicant's ability to meet the GALL Report "detection of aging effects" program element. Therefore, the staff will consider issuing a RAI to address this issue, and the staff's evaluation will be documented in the SER.

The 3 program elements, corrective actions, confirmation process and administrative controls were audited as part of the Scoping and Screening Methodology audit. During the Aging Management Program audit, the staff compared 7 program elements in the applicant's program and verified that these 7 elements for the AMP were consistent with those specified in GALL AMP XI.M23, except for the areas in which the staff felt additional clarification might be warranted as described above.

LRA AMP B.2.24, Lubricating Oil Analysis Program

In the LRA, the applicant stated that AMP B.2.24 is an existing program that is consistent with GALL AMP XI.M39, “Lubricating Oil Analysis Program.”

During its audit, the staff audited the applicant’s on-site documentation supporting the applicant’s conclusion that the program elements are consistent with the elements in the GALL AMP. The staff interviewed the applicant’s technical staff and audited the following on-site documents.

DOCUMENT	TITLE	REVISION / DATE
LRBV-PED-XI.M39	Beaver Valley Power Station Lubricating Oil Analysis Program (Unit 1 and Unit 2)	Rev. 2, 06/21/2007
1/2-ADM-2104	Lubricating Oil Analysis Program	Rev.2, 06/21/2007
LRBV-AMPB-001	Aging Management Programs Common Information	8/06/2007

The staff also audited the operating experience reports, including a sample of condition reports, and interviewed the applicant’s technical staff to confirm that the plant-specific operating experience did not reveal any degradation not bounded by industry experience.

The 3 program elements, corrective actions, confirmation process and administrative controls were audited as part of the Scoping and Screening Methodology audit. During the Aging Management Program audit, the staff compared 7 program elements in the applicant’s program and verified that these 7 elements for the AMP were consistent with those specified in GALL AMP XI.M39.

LRA AMP B.2.25. Masonry Wall Program

In the LRA, the applicant stated that AMP B.2.25 is an existing program that is consistent with GALL AMP XI.S5.

During its audit, the staff audited the applicant's on-site documentation supporting the applicant's conclusion that the program elements are consistent with the elements in the GALL AMP. The staff interviewed the applicant's technical staff and audited the following on-site documents.

DOCUMENT NUMBER	TITLE	REVISION /DATE
LRBV-PED-XI.S5	Masonry Wall Program Evaluation document	Rev. 3, 01/16/2008
LVBV-OE-001	Operation Experience Review Report	Rev.3, 01/16/2008
1/2 -ADM-2016	General Area Structural Inspections	Rev.1, 12/09/2006
8700-DSS-0083	Inspection Specification for Concrete Block Walls	Rev.1, 12/15/1992

The staff audited the Masonry Wall Program by comparing the 7 elements in the applicant's program for which the applicant claims consistency with GALL AMP XI.S5. The staff noted that the Masonry Wall Program includes the guidance and lessons learned from Office of Inspection and Enforcement Bulletin 80-11 and Information Notice 87-67. During the audit, the staff asked for the visual examination frequency for the program and its technical basis. In its response, the applicant stated that the inspection is implemented by the Structures Monitoring Program and consist of visual inspection for cracking in joints, deterioration of penetrations, missing or broken blocks, missing mortar, and general mechanical soundness of steel supports. Visual inspections are at least every five years to ensure no loss of intended function between inspections. The absence of operating experience with significantly degraded masonry walls indicates that this frequency is appropriate.

The staff also audited the operating experience reports including a sample of condition reports and interviewed the applicant's technical staff to confirm that the plant-specific operating experience did not reveal any degradation not bounded by industry experience.

The 3 program elements, corrective actions, confirmation process and administrative controls were audited as part of the Scoping and Screening Methodology audit. During the Aging Management Program audit, the staff compared 7 program elements in the applicant's program and verified that these 7 elements for the AMP were consistent with those specified in GALL AMP XI.S5.

LRA AMP B.2.26, Metal Enclosed Bus (Unit 2 Only)

In the Beaver Valley LRA, the applicant stated that BVPS AMP B.2.26 is a new program that is consistent with GALL AMP XI.E4, “Metal Enclosed Bus.”

During its audit, the staff audited the applicant’s claim of consistency with the GALL AMP. Specifically, the staff interviewed the applicant’s technical staff and audited the following documents:

DOCUMENT NUMBER	TITLE	REVISION /DATE
LRBV-PED-XI.E4	Metal Enclosed Bus	Rev.3, 07/23/2007
LRBV-PED-XI.E4	Metal Enclosed Bus References	Rev.3, 07/23/2007
LRBV-EAMR-001	BVPS License Renewal Project Document	Rev.5, 11/30/2007

In comparing the elements in the applicant’s program, the staff verified that the program elements contained in Beaver Valley AMP B.2.26 are consistent with GALL AMP XI.E4 program elements. The staff confirmed that the boundary conditions of the plant program are enveloped by the boundary conditions described in the GALL AMP. The staff also verified that the applicant provided an adequate summary description of the program.

The technical information and guidance identified in GALL AMP X1.E4 were presented in Metal Enclosed Bus LRBV-PED-X1.E4 and references. Based on its audit, the staff identified an issue where additional clarifications were needed to complete the audit. The applicant did not identify iso-phase bus within the scope of Metal Enclosed Bus Program. The staff will consider issuing a RAI to address this issue, and the staff’s evaluation will be documented in the SER.

The staff also audited the operating experience reports, including a sample of condition reports, and interviewed the applicant’s technical staff to confirm that the plant-specific operating experience did not reveal any degradation not bounded by industry experience. In BVPS AMP B.2.26, the applicant stated that the Metal Enclosed Bus Program is a new aging management program for which there is no plant-specific operating experience for program effectiveness. In order to be consistent with the staff’s recommendations in Section A.1.2.3.10, item 2 of SRP-LR Branch Position RLSB-1 (i.e. Branch Position RLSB-1 of Appendix A to NUREG-1800), the staff will consider issuing an RAI requesting that the applicant provide a commitment in the application to submit future operating experience on this AMP to the staff in order to confirm the effectiveness of this program. This RAI will also consider requesting the applicant to discuss and submit any observed material degradation found during the implementation of other existing activities that relate to the aging effects that will be managed by the new program. This RAI will be evaluated and documented in the SER.

The 3 program elements, corrective actions, confirmation process and administrative controls were audited as part of the Scoping and Screening Methodology audit. During the Aging Management Program audit, the staff compared 7 program elements in the applicant’s program and verified that these 7 elements for the AMP were consistent with those specified in GALL AMP XI.E4, except for the areas in which the staff felt additional clarification might be warranted as described above.

LRA AMP B.2.27, Metal Fatigue of Reactor Coolant Pressure Boundary

In the BVPS LRA, the applicant stated that BVPS AMP B.2.27 is an existing program that is consistent with GALL AMP X.M1.

During its audit, the staff audited the applicant's on-site documentation supporting the applicant's conclusion that the program elements are consistent with the elements in the GALL report. The staff interviewed the applicant's technical staff and audited the following on-site documents listed.

DOCUMENT NUMBER	TITLE	REVISION/DATE
LRBV-PED-X.M1	Metal Fatigue of Reactor Coolant Pressure Boundary Program (Unit 1 and Unit 2)	Rev. 2, 07/24/07
LRBV-OE-001	Operating Experience Review Report	
1/2 -ADM-2115	Fatigue Cycle Monitoring Program	Rev. 1, 04/30/07
1/2 DBD-M-001	Fatigue Analysis	Rev. 0, 07/19/07
WCAP-16173-P	Beaver Valley Units 1 and 2 Design Basis Transient Evaluation for License Renewal	Rev. 0, 03/2004, including Errata dated 08/11/2004

In comparing the 7 elements in the applicant's program to those in GALL AMP X.M1, the staff found the LRA section B. 2.27 does not provide sufficient detail to determine whether "Metal Fatigue of Reactor Coolant Pressure Boundary Program" is adequate for the period of extended operation. Therefore, the staff will consider issuing an RAI requesting the applicant to provide sufficient detail under the program description on the scope of the program, methodology for monitoring the critical and thermal transients periodic updates of fatigue usage calculation, and how it will address environmentally assisted fatigue (EAF).

In addition, staff will consider issuing an RAI requesting the applicant to provide sufficient detail on supplemental transients, which was identified in the LRA and as scope of the program. These include the major components affected, the update of related fatigue analysis, consistency between supplemental transients and design transients, and monitoring information for these transients.

The staff will also consider issuing an RAI requesting the basis for the applicant's selection of critical transients. In addition, the staff will consider issuing another RAI on triggering point and its follow-up corrective actions, including the process incorporated into the plant procedure. These RAIs pertain to the program element, "parameters monitored."

The staff audited the basis documents supplied by the applicant that support the LRA, and discussed its review with the applicant. Two RAIs will be considered to be issued on the discrepancy between the LRA and the basis documents. The first will request the applicant to justify the discrepancy on the 60-year projected cycles, and the second will request the applicant to justify any difference between the LRA and the basis documents for the design transients.

The staff also noted in its review of the basis documents that the applicant does not require monitoring of the design transient, RHR actuation, of BVPS Unit 1. Therefore, an RAI will be considered to be issued on the basis of the monitoring for the transient during the period of extended operation.

The staff requested the applicant to explain the on-line fatigue monitoring system during the on-site discussion. The staff will consider issuing an RAI requesting the applicant's benchmarking results, including the purpose of the system, in order to determine the adequacy of the model incorporated in the system.

The staff also noted that LRA section B.2.27 should provide a supporting description if specific TLAAs have been dispositioned in accordance with 10 CFR 54.21(c)(1)(iii) in the LRA Section 4.3 as aging management program. Thus, the staff will consider issuing an RAI requesting information on the method used by the applicant to monitor the transients with several BVPS unit 2 auxiliary heat exchangers.

The staff audited the operating experience and selected condition reports associated with this AMP, and interviewed the applicant's technical staff to confirm that the effects of aging will be managed adequately during the period of extended operation. The staff noted that the LRA indicated a re-analysis of the charging piping was required to account for the appropriate transients for a 60-year plant life. The staff will consider issuing an RAI requesting information on the basis for the determination with no further evaluation of the letdown or excess letdown piping and the status of re-analysis for the charging piping and its EAF evaluation.

The staff's evaluation of the RAI's will be documented in the SER.

The 3 program elements, corrective actions, confirmation process and administrative controls were audited as part of the Scoping and Screening Methodology audit. During the Aging Management Program audit, the staff compared 7 program elements in the applicant's program and verified that these 7 elements for the AMP were consistent with those specified in GALL AMP X.M1, except for the areas in which the staff felt additional clarification might be warranted as described above.

LRA AMP B.2.29, Nickel-Alloy Penetration Nozzles Welded to the Upper Reactor Vessel Closure Head Program

In the Beaver Valley Power Station LRA, the applicant states that AMP B.2.29 is an existing program that is consistent with the program elements in GALL AMP XI.M11, "Nickel-Alloy Penetration Nozzles Welded to the Upper Reactor Vessel Closure Head." The applicant's program is credited to manage cracking due to primary water stress corrosion cracking (PWSCC) that could potentially occur in the Nickel-alloy penetration nozzles that are welded to the applicant's reactor vessel closure heads (RVCHs) or their associated J-groove welds. The applicant also credits the AMP to manage loss of material due to boric acid-induced wastage in the upper RVCHs.

During its audit, the staff audited the applicant's on-site documentation to determine whether the program elements in the applicant's AMP are consistent with the elements in the GALL report program. The staff interviewed the applicant's technical staff and audited the following additional on-site documents and NRC-issued documents listed below:

DOCUMENT NUMBER	TITLE	REVISION/ DATE
LRBV-PED-XI.M11A	Beaver Valley Power Station (BVPS) Nickel-Alloy Penetration Nozzle Welded to the Upper Reactor Vessel Closure Head Program	Rev.3, 01/17/08
NOP-ER-2003	Alloy 600/690 Management Program	Rev.1 / February 28, 2007
1/2-ADM-2096	Alloy 600/690 Management Program	Rev.4 / February 28, 2007
1/2-ADM-0801	ASME Section XI Repair/Replacement Program	Rev.5 / September 6, 2006
LRBV-AMP-001	Aging Management Program Common Information	Rev.1 / August 6, 2007
NRC First Revised Order No. EA-03-009	Establishing Interim Inspection Requirements for Reactor Pressure Vessel Heads at Pressurized Water Reactors	February 20, 2004
L-04-030	Beaver Valley Power Station, Unit No. 1 and No. 2, BV-1 Docket No. 50-334, License No. DPR-66, BV-2 Docket No. 50-412, License No. NPF-73, Response to First Revised Order (EA-03-009),"	March 5, 2004
Order EA 03-009	Issuance of Order Establishing Interim Inspection Requirements for Reactor Pressure Vessel Heads at Pressurized Water Reactors	February 11, 2003
L-03-035	Beaver Valley Power Station, Unit No. 1 and No. 2, BV-1 Docket No. 50-334, License No. DPR-66, BV-2 Docket No. 50-412, License No. NPF-73, Order Establishing Interim Inspection Requirements for RPV Heads	March 3, 2003

Specifically, the staff audited the program element descriptions for the “scope of program,” “preventative actions,” “parameters monitored/detected,” “detection of aging effects,” “monitoring and trending,” “acceptance criteria,” and “operating experience,” program elements in the applicant program against the corresponding program element descriptions that are defined and described in GALL AMP XI.M11.

The staff’s reviews of the “corrective actions,” “confirmatory actions,” and “administrative controls” program elements for the applicant’s program were performed as part of the staff’s review of the applicant’s quality assurance program, which is provided in LRA Section B.1.3.

In comparing the 7 elements in the applicant’s program to those in GALL AMP XI.M11, “Nickel-Alloy Penetration Nozzles Welded to the Upper Reactor Vessel Closure Head,” the staff noted that the program elements for the applicant’s AMP were consistent with the program element criteria recommended in the GALL AMP and that the applicant had addressed the relevant BVPS Unit 1 and 2 operating experience for its upper RVCH and RVCH nozzle examinations. The staff did not have any issues with respect to the program elements for the applicant’s Nickel-Alloy Penetration Nozzles Welded to the Upper Reactor Vessel Closure Head Program, and therefore did not issue any requests for additional information relative to the applicant’s Nickel-Alloy Penetration Nozzles Welded to the Upper Reactor Vessel Closure Head Program.

The staff audited the applicant’s operating experience and selected reports associated with Nickel-Alloy Penetration Nozzles Welded to the Upper Reactor Vessel Closure Head Program. The staff also interviewed the applicant’s technical staff to confirm that plant-specific operating experience did not reveal any degradation outside the bounds of industry experience.

The 3 program elements, corrective actions, confirmation process and administrative controls were audited as part of the Scoping and Screening Methodology audit. During the Aging Management Program audit, the staff compared 7 program elements in the applicant’s program and verified that these 7 elements for the AMP were consistent with those specified in GALL AMP XI.M11.

LRA AMP B.2.30, One-Time Inspection Program

In the LRA, the applicant stated that AMP B.2.30 is a new program that when implemented will be consistent with GALL AMP XI.M32, "One-Time Inspection."

During its audit, the staff audited the applicant's on-site documentation supporting the applicant's conclusion that the program elements are consistent with the elements in the GALL AMP. The staff interviewed the applicant's technical staff and audited the following on-site documents.

DOCUMENT NUMBER	TITLE	REVISION/DATE
LRBV-PED-XI.M32	Beaver Valley Power Station One-Time Inspection Program (Unit 1 and Unit 2)	Rev. 5, 1/17/2008
Proposed 1/2-ADM-[XI.M32]	One-Time Inspection Program	Rev. 0

The "operating experience" element states that the One-Time Inspection Program is a new program and there is no plant-specific program operating experience. In order to be consistent with the staff's recommendations in Section A.1.2.3.10, item 2 of SRP-LR Branch Position RLSB-1 (i.e. Branch Position RLSB-1 of Appendix A to NUREG-1800), the staff will consider issuing an RAI requesting that the applicant provide a commitment in the application to submit future operating experience on this AMP to the staff in order to confirm the effectiveness of this program. This RAI will also consider requesting the applicant to discuss and submit any observed material degradation found during the implementation of other existing activities that relate to the aging effects that will be managed by the new program. This RAI will be evaluated and documented in the SER.

The 3 program elements, corrective actions, confirmation process and administrative controls were audited as part of the Scoping and Screening Methodology audit. During the Aging Management Program audit, the staff compared 7 program elements in the applicant's program and verified that these 7 elements for the AMP were consistent with those specified in GALL AMP XI.M32.

LRA AMP B.2.31, One-Time Inspection of ASME Code Class 1 Small Bore Piping

In the BVPS LRA, the applicant stated that BVPS AMP B.2.31 is a new program that is consistent with GALL AMP XI.M35, "One-Time Inspection of ASME Code Class 1 Small Bore Piping."

During its audit, the staff audited the applicant's on-site documentation supporting the applicant's conclusion that the program elements are consistent with the elements in the GALL report. The staff interviewed the applicant's technical staff and audited the following on-site documents listed.

DOCUMENT NUMBER	TITLE	REVISION/DATE
Proposed 1/2 –ADM-[XI.M35	Beaver Valley Power Station One-Time Inspection of ASME Code Class 1 Small-Bore Piping Program	
MRP-24, EPRI 1000701	Interim Thermal Fatigue Management Guideline	1/2001
NRC Bulletin 88-08	Thermal Stresses in Piping Connected to Reactor Coolant Systems including Supplements 1, 2, and 3	
LRBV-MAMR-006	Reactor Coolant System	Rev. 9, 1/8/08
LRBV-PED-XI.M35	One-Time Inspection of ASME Code Class 1 Small Bore Piping Vol. 1	Rev. 4, 8/16/07
LRBV-PED-XI.M35	One-Time Inspection of ASME Code Class 1 Small Bore Piping Vol. 2	Rev. 4, 8/16/07

The staff audited operating experience and selected condition reports and interviewed the applicant's technical staff to confirm that the plant-specific operating experience did not reveal any degradation not bounded by industry experience. In the application, the applicant stated that there is no operating experience for the effectiveness of the program because it is a new program. In order to be consistent with the staff's recommendations in Section A.1.2.3.10, item 2 of SRP-LR Branch Position RLSB-1 (i.e. Branch Position RLSB-1 of Appendix A to NUREG-1800), the staff will consider issuing an RAI requesting that the applicant provide a commitment in the application to submit future operating experience on this AMP to the staff in order to confirm the effectiveness of this program. This RAI will also consider requesting the applicant to discuss and submit any observed material degradation found during the implementation of other existing activities that relate to the aging effects that will be managed by the new program. This RAI will be evaluated and documented in the SER.

The 3 program elements, corrective actions, confirmation process, and administrative controls were audited as part of the Scoping and Screening Methodology audit. During the Aging Management Program audit, the staff compared 7 program elements in the applicant's program and verified that these 7 elements for the AMP were consistent with those specified in GALL AMP XI.M35.

LRA AMP B2.32, Open-Cycle Cooling Water System Program

In the LRA, the applicant stated that AMP B2.32 is an existing program that, following enhancements, will be consistent with GALL AMP XI.M20, Open-Cycle Cooling Water System.

The applicant stated that the GALL program's scope is a prevention, performance monitoring, and condition monitoring program that manages the effects of aging on the systems, structures, component types, and commodity groups. The applicant summarized that the following systems have their aging management review reports (including materials, environments, and corresponding aging effects requiring management) addressed by this aging management program:

- Reactor Plant Component and Neutron Shielded Tank Cooling Water System
- Primary Plant Component and Neutron Shielded Tank Cooling Water System
- Chemical and Volume Control System, Charging Pump Lube Oil Coolers
- Emergency Diesel Generator and Support System, Cooling Water Heat Exchangers
- Containment Depressurization System, Recirculation Spray Heat Exchangers
- Area Ventilation Systems – Control Area A/C Condensing Unit Heat Exchangers
- River Water System, Control Room Redundant Cooling Coils
- River Water System, Auxiliary River Water Pump Motor Oil Coolers
- Service Water System, Control Room Backup Air Conditioning Units
- Area Ventilation Systems, Control Room Refrigeration Unit Condensers
- Ventilation Systems, Alternate S/D Panel Air Conditioning Unit Condensers
- Ventilation Systems, MCC Cubicle Cooling Coils
- Ventilation Systems, Safeguards Area Air Conditioning Units
- Service Water System, Standby Service Water Pump Motor Oil Coolers
- Service Water System, Pump Motor Oil Coolers
- Radiation Monitoring System, Recirculation Spray Heat Exchanger Rad Monitor Coolers
- Post Accident Sample System, Sample Cooler
- Auxiliary Feed Water System, Emergency Supply Water Valves

The applicant stated that the Open-Cycle Cooling Water System Program implements the site commitments to NRC Generic 89-13, "Service Water System Problems Affecting Safety-Related Equipment," including Supplement 1. The applicant explained that this program manages the aging effects on the open-cycle cooling water systems such that the systems will be able to fulfill their intended functions during the period of extended operation. The applicant also stated that the program includes surveillance and control techniques to manage aging effects caused by biofouling, corrosion, erosion, protective coating failures, and silting in the River Water and Service Water Systems or structures and components serviced by the systems.

During its audit the staff audited the applicant's on-site documentation to support its conclusion that the program elements are consistent with the elements in the GALL AMP. The staff interviewed the applicant's technical staff and audited the following on-site documents.

Document Number	Title	Revision and/or Date
1. LRBV-PED-XI.M20	Beaver Valley Power Station Open-Cycle Cooling Water Program (Unit 1 and Unit 2)	Rev.5, 02/14/2008
2. LRBV-AMPB-001	Aging Management Programs Common Information	Rev.1, 08/06/2007
3. LRBV-OE-001	Beaver Valley Power Station Operating Experience Review Report	Rev. 3, 01/16/2008
Ltr 1-29-1990	Beaver Valley Response to Generic Letter 89-13, Service Water System Problems Affecting Safety-Related Equipment	01/29/1990
Ltr 6-27-1991	Beaver Valley Second Response to Generic Letter 89-13, Service Water System Problems Affecting Safety-Related Equipment	06/27/1991

As a result of the staff's IP-71002 inspections that occurred during the weeks of June 23 and July 14, 2008, the applicant identified necessary revisions to the LRA which includes new program enhancements. The applicant provided the program changes in letter L-08-262 dated, September 9, 2008 which includes LRA Amendment No. 23. The following is the staff's evaluation of the Amendment. Therefore, the applicant identified the following enhancements to their current Open-Cycle Cooling Water Program:

The "Scope of Program" will be expanded to include a Unit 1 Post Accident Sample System heat exchanger (PAS-E-1) credited with a leakage boundary function.

The "Detection of Aging Effects" describe that the internal condition of buried piping will be assessed by opportunistic inspections of header piping internals during removal of expansion joints and inline valves in the headers. Evaluation of inspection results will be documented and trended.

The staff's review of the applicant's on-site documentation did not identify any differences between the program described in site documents and the applicant's claim of consistency with the FALL Report AMP XI.M20. The staff does not anticipate issuing any RAls related to the applicant's claims of consistency for those program elements where the applicant claims consistency with the GALL Report's program elements.

The staff verified that the LRA includes LRA Section A.4 and A.5 (i.e., UFSAR Supplement Section A.1.31 and A.1.32 for Unit 1 and Unit 2, respectively), which provides the applicant's UFSAR Supplement summary description for the Open-Cycle Cooling Water System Program. The staff verified that LRA Commitments No. 30 for Unit 1 and Commitment 31 for Unit 2 credits this existing program for aging management and that the commitment has been aligned with the UFSAR Supplement Sections A.1.31 and A.1.32 for Unit 2. This commitment also includes a statement that the applicant's program will be enhanced to include in the program scope for Unit 1, the Post Accident Sample System heat exchanger credited with a leakage boundary function and to assess the internal condition of buried piping by opportunistic inspections of header piping internals during removal of expansion joints and inline valves in the headers and that the evaluation of such inspection results will be documented and trended. This commitment also includes a statement that the applicant's program will be enhanced to include in the program

scope for Unit 2, to assess the internal condition of buried piping by opportunistic inspections of header piping internals during removal of expansion joints and inline valves in the headers and that the evaluation of such inspections will be documented and trended. The staff will evaluate the UFSAR Supplement Section A.1.31 and A.1.32 and LRA Commitments No. 30 and 31 in the SER.

The staff audited the applicant's operating experience and selected reports associated with the Open-Cycle Cooling Water System Program. The staff also interviewed the applicant's technical staff to confirm that plant-specific operating experience did not reveal any degradation outside the bounds of industry experience.

The 3 program elements, corrective actions, confirmation process, and administrative controls were reviewed as part of the Scoping and Screening Methodology audit. During the Aging Management Program audit, the staff compared 7 program elements in the applicant's program and verified that these 7 elements for the AMP, are consistent with those specified in GALL AMP XI.M20 in the areas where the applicant claimed consistency with the GALL Report.

LRA AMP B.2.34, Reactor Head Closure Studs

In the Beaver Valley LRA, the applicant stated that BVPS AMP B.2.34 is an existing program that is consistent with GALL AMP XI.M3, "Reactor Head Closure Studs" with an exception. The exception is an ASME code edition change. Beaver Valley uses the 1989 edition.

During its audit, the staff audited the applicant's on-site documentation supporting the applicant's conclusion that the program elements are consistent with the elements in the GALL AMP. The staff audited the following on-site documents.

DOCUMENT NUMBER	TITLE	REVISION /DATE
LRBV-PED-XI.M3	"Reactor Head Closure Studs"	Rev. 2, 1/17/08
1/2-ADM-0801	"ASME Section XI Repair/Replacement Program"	Rev. 5, 9/6/06
1/2-ADM-2039	"BVPS Ten Year Plans"	Rev. 5, 1/26/07
1/2-ADM-2045	"Inservice Inspection"	Rev. 0
1RP-2.6	"Remove Reactor Vessel Studs/Clean"	Rev. 4, 1/26/04
2RP-2.6	"Refueling Procedure- Remove reactor vessel studs/clean"	Rev. 4, 1/20/04
1/2RP-2.7	"Reactor Vessel Head Removal Head Removal/Lift Rig Checkout"	Rev. 9, 3/6/07
LRBV-OE-001	"Operating Experience Review Report"	Rev. 3, 1/16/08

The staff compared the elements in the applicant's program with the GALL Report program elements. The staff also audited the operating experience reports, including a sample of condition reports, and interviewed the applicant's technical staff to confirm that the plant-specific operating experience did not reveal any degradation not bounded by industry experience. The reports indicated that in 2006, the refueling outages 1R17 and 2R12 included reactor head studs ultrasonic testing examinations which both resulted in no undesirable indications. The reports further indicated there is no history of reactor vessel studs, nuts, and washers being found with cracks, or anything more significant than "minor nicks and scratches."

The 3 program elements, corrective actions, confirmation process and administrative controls were audited as part of the Scoping and Screening Methodology audit. During the Aging Management Program audit, the staff compared 7 program elements in the applicant's program and verified that these 7 elements for the AMP were consistent with those specified in GALL AMP XI.M3, not including any exceptions identified by the applicant in the LRA for this AMP, which will be evaluated separately in the SER.

LRA AMP B.2.36, Selective Leaching of Materials

In the BVPS LRA, the applicant stated that B.2.36 is a new program that is consistent with GALL AMP XI.M34, "Selective Leaching of Materials" with an exception.

During its audit, the staff audited the applicant's on-site documentation supporting the applicant's conclusion that the program elements are consistent with the elements in the GALL report. The staff interviewed the applicant's technical staff and audited the following on-site documents listed.

DOCUMENT NUMBER	TITLE	REVISION/DATE
LRBV-MAMR-008	"Aging Management Review of the Boron Recovery and Primary Grade Water System"	Rev 5, 6/22/07
LRBV-MAMR-009	"Aging Management Review of the Reactor Plant Vents and Drains Systems"	Rev. 6, 7/26/07
LRBV-MAMR-012	"Aging Management Review of the Containment Vacuum and Leakage Monitoring System"	Rev 5, 6/22/07
LRBV-MAMR-014A	"Aging Management Review of the Reactor Plant Sample System"	Rev 5, 6/22/07
LRBV-MAMR-015	"Aging Management Review of the Primary Component and Neutron Shield Tank System"	Rev 5, 6/22/07
LRBV-MAMR-017	"Aging Management Review of the Liquid Waste Disposal System"	Rev 5, 6/22/07
LRBV-MAMR-018	"Aging Management Review of the Solid Waste Disposal System"	Rev 5, 6/22/07
LRBV-MAMR-022	"Aging Management Review of the Demineralization Water System"	Vol. 1 & 2, Rev 5, 6/22/07
LRBV-MAMR-24B	"Aging Management Review of the Auxiliary Feedwater System"	Rev 6, 8/3/07
LRBV-MAMR-026	"Aging Management Review of the Main Turbine and Condenser System"	Rev 5, 6/22/07
LRBV-MAMR-027	"Aging Management Review of the Auxiliary Steam System"	Rev 5, 6/22/07
LRBV-MAMR-029	"Aging Management Review of the Chilled Water System"	Rev 5, 6/22/07
LRBV-MAMR-30-1	"Aging Management Review of the River Water System"	Rev 5, 8/3/07
LRBV-MAMR-30-2	"Aging Management Review of the Service Water System"	Rev 5, 6/22/07
LRBV-MAMR-032	"Aging Management Review of the Water Treating System"	Rev 5, 6/22/07
LRBV-MAMR-033	"Aging Management Review of the Fire Protection System"	Rev 5, 6/22/07
LRBV-MAMR-034	"Aging Management Review of the Compressed Air System"	Rev 5, 6/22/07
LRBV-MAMR-36A	"Aging Management Review of the Emergency Diesel Generator System"	Rev. 6, 7/20/07

Document Number	Title	Revision/Date
LRBV-MAMR-41A	"Aging Management Review of the Building Services Hot Water Heating System"	Rev 4, 6/22/07
LRBV-MAMR-41B	"Aging Management Review of the Building Services Glycol Heating System"	Rev 4, 6/22/07
LRBV-MAMR-41C	"Aging Management Review of the Domestic Water System"	Rev 4, 6/22/07
LRBV-MAMR-41D	"Aging Management Review of the Building and Yard Drains System"	Rev. 7, 1/8/08
LRBV-MAMR-44A	"Aging Management Review of the Control Area Ventilation System"	Rev. 6 7/2/07
LRBV-MAMR-45F	"Aging Management Review of the Security Diesel Generator System"	Rev 5, 6/22/07
LRBV-MAMR-58E	"Aging Management Review of the EFR Diesel Generator System"	Rev. 6, 1/8/08
LRBV-MAMR-VENT	"Aging Management Review of the Area Ventilation Systems"	Rev. 6, 10/25/07
CR Number 01- 0108	Multiple Ruptures of the Fire Header, 01/10/2001	01/10/2001
CR Number 00- 3147	Containment Instrument Air Check Valve Internals	
LRBV-PED-XI.M33	Selective Leaching of Materials Inspection Vol. 1	Rev. 5, 1/17/08
LRBV-PED-XI.M33	Selective Leaching of Materials Inspection Vol. 2	Rev. 5, 1/17/08

The staff also audited operating experience and selected condition reports and interviewed the applicant's technical staff to confirm that the plant-specific operating experience did not reveal any degradation not bounded by industry experience. In the application, the applicant stated that there is no operating experience for the effectiveness of the program because it is a new program. In order to be consistent with the staff's recommendations in Section A.1.2.3.10, item 2 of SRP-LR Branch Position RLSB-1 (i.e. Branch Position RLSB-1 of Appendix A to NUREG-1800), the staff will consider issuing an RAI requesting that the applicant provide a commitment in the application to submit future operating experience on this AMP to the staff in order to confirm the effectiveness of this program. This RAI will also consider requesting the applicant to discuss and submit any observed material degradation found during the implementation of other existing activities that relate to the aging effects that will be managed by the new program. This RAI will be evaluated and documented in the SER.

The 3 program elements, corrective actions, confirmation process and administrative controls were audited as part of the Scoping and Screening Methodology audit. During the Aging Management Program audit, the staff compared 7 program elements in the applicant's program and verified that these 7 elements for the AMP were consistent with those specified in GALL AMP XI.M34, not including any exceptions identified by the applicant in the LRA for this AMP, which will be evaluated separately in the SER, and the areas in which the staff felt additional clarification might be warranted as described above.

LRA AMP B.2.38, Steam Generator Tube Integrity Program

In the LRA, the applicant stated that AMP B.2.38 is an existing program that is consistent with GALL AMP XI.M19, “Steam Generator Tube Integrity.”

During its audit, the staff audited the applicant’s on-site documentation supporting the applicant’s conclusion that the program elements are consistent with the elements in the GALL AMP. The staff interviewed the applicant’s technical staff and audited the following on-site documents.

DOCUMENT NUMBER	TITLE	REVISION /DATE
LRBV-PED-XI.M19	Beaver Valley Power Station Steam Generator Tube Integrity Program (Unit 1 and Unit 2)	Rev.3, 01/24/2008
LRBV-AMPB-001	Aging Management Programs Common Information	Rev.1, 08/06/2007
LRBV-OE-001	Beaver Valley Power Station Operating Experience Review Report	Rev. 3, 01/16/2008

In comparing the AMP element, scope of program to GALL AMP XI.M19, the staff found that the applicant has included the component types “feedrings and J-Nozzles” within its bounds. The staff noted however, that GALL AMP XI.M19 does not include the component types, “feedrings and J-Nozzles” within its scope to manage their aging effects. Additionally, the staff audited LRA Table item 3.1.1-76 which states that feedrings and J-Nozzles are managed, in part (in combination with Water Chemistry, B.2.42), by the Steam Generator Tube Integrity Program. The staff will consider issuing an RAI to address why this is not a program enhancement. The staff’s evaluation will be documented in the SER.

The staff also audited the operating experience reports, including a sample of condition reports, and interviewed the applicant’s technical staff to confirm that the plant-specific operating experience did not reveal any degradation not bounded by industry experience.

The 3 program elements, corrective actions, confirmation process and administrative controls were audited as part of the Scoping and Screening Methodology audit. During the Aging Management Program audit, the staff compared 7 program elements in the applicant’s program and verified that these 7 elements for the AMP were consistent with those specified in GALL AMP XI.M19, except the areas in which the staff felt additional clarification might be warranted as described above.

LRA AMP B.2.39, Structures Monitoring Program

In the BVPS LRA, the applicant stated that BVPS AMP B.2.39 is an existing program that is consistent with GALL AMP XI.S6, "Structures Monitoring Program."

During its audit, the staff audited the applicant's on-site documentation supporting the applicant's conclusion that the program elements are consistent with the elements in the GALL AMP. The staff interviewed the applicant's technical staff and audited the following on-site documents.

DOCUMENT NUMBER	TITLE	REVISION /DATE
LRBV-PED-XI.S6	Structures Monitoring Program Evaluation Document	Rev. 3, 01/16/2008
LVBV-OE-001	Operation Experience Review Report	Rev.5, 01/16/2008
1/2 -ADM-2114	MR program Admins. Procedure	Rev.3, 05/19/2006
1/2-ADM-2016	General Area Structural Inspections	Rev.3

In comparing the elements in the applicant's program, the staff noted that failure of coatings could result in aging effects for steel shell in containment. The failure of coatings could also result in the failure of safety systems to perform their intended functions. The staff will consider issuing an RAI requesting the applicant to justify not having an aging management program for coatings. In addition, it is not clear to the staff how the applicant satisfies the GALL Report "parameters monitored/inspected" program element. Specifically, the GALL Report program element suggested ACI 349.3R-96 and ANSI/ASCE 11-90 for an acceptable basis for selection of parameters to be monitored. Because the applicant does not include the frequency of periodic sampling of ground water for pH, chloride, and sulfate concentration, the staff will consider issuing an RAI requesting the applicant to provide the time frame for the "periodic" sampling, and for the results of the last two samplings of groundwater. The staff's evaluation of these RAIs will be documented in the SER.

The staff also audited the operating experience reports, including a sample of condition reports, and interviewed the applicant's technical staff to confirm that the plant-specific operating experience did not reveal any degradation not bounded by industry experience.

The 3 program elements, corrective actions, confirmation process and administrative controls were audited as part of the Scoping and Screening Methodology audit. During the Aging Management Program audit, the staff compared 7 program elements in the applicant's program and verified that these 7 elements for the AMP were consistent with those specified in GALL AMP XI.S6, except for the areas in which the staff felt additional clarification might be warranted as described above.

LRA AMP B.2.40, Thermal Aging and Neutron Irradiation Embrittlement of Cast Austenitic Stainless Steel (CASS)

In the Beaver Valley Power Station LRA, the applicant stated that AMP B.2.40 is a new program that will be consistent with the program elements in GALL AMP XI.M13, “Thermal Aging and Neutron Irradiation Embrittlement of Cast Austenitic Stainless Steel (CASS).” The applicant’s Thermal Aging and Neutron Irradiation Embrittlement of Cast Austenitic Stainless Steel (CASS) Program is a new program that is credited to manage reduction of fracture toughness that may occur in CASS reactor vessel internal (RVI) components as a result of thermal aging embrittlement or neutron irradiation embrittlement.

During its audit, the staff audited the applicant’s on-site documentation to determine whether the program elements in the applicant’s AMP are consistent with the elements in the GALL report program. The staff interviewed the applicant’s technical staff and audited the following additional on-site documents and NRC-issued documents listed below:

DOCUMENT NUMBER	TITLE	REVISION /DATE
LRBV-PED-XI.M13	Thermal Aging and Neutron Irradiation Embrittlement of Cast Austenitic Stainless Steel (CASS)	Rev.2 / July 26, 2007
NRC Letter of May 19, 2000 from C Grimes(NRC) to D. J. Walter (NEI)	License Renewal Issue No., 98-0030, “Thermal Aging Embrittlement of Cast Austenitic Stainless Steel Component	
NUREG/CR-4513	Estimation of Fracture Toughness of Cast Stainless Steels During Thermal Aging in LWR Systems	Rev. 1 / May 1994
LRBV-AMPB-001	Aging Management Common Information	August 6, 2007

Specifically, the staff audited the program element descriptions for the “scope of program,” “preventative actions,” “parameters monitored/detected,” “detection of aging effects,” “monitoring and trending,” “acceptance criteria,” “corrective actions,” and “operating experience,” program elements in the applicant program against the corresponding program element descriptions that are defined and described in GALL AMP XI.M13.

The staff’s review of the “confirmatory actions,” and “administrative controls” program elements were performed as part of the staff’s review of the quality assurance program for the LRA.

The staff felt that the following three (3) topics required additional clarification and in which requests for additional information (RAI) will be considered to be issued. The staff’s evaluation will be documented in the Safety Evaluation Report (SER).

In the first topic needing additional clarification, the staff was aware that the current state-of-the-art ultrasonic testing (UT) methods in the industry are incapable of distinguishing between UT indication signals that arise from relevant flaw indications in CASS components and those that arise as background noise signals as a result of the complexity in the CASS grain structure (i.e., CASS microstructure). The staff sought clarification from the applicant on the alternative inspection methods that would be used if the current state-of-the-art UT methods remained

inadequate for CASS materials, and will consider issuing an RAI to resolve this issue. The staff's basis for issuing and resolving this RAI will be discussed in the SER section for this AMP.

In the second topic needing additional clarification, the staff noted that the applicant had indicated that it may use the industry initiatives of the Electric Power Research Institute Materials Reliability Program Task Group on PWR RVI components as an alternative to using the program to manage reduction of fracture toughness in the CASS RVI components. The staff believes that this basis should have been identified as an exception to the "scope of program," program element of the applicant's Thermal Aging and Neutron Irradiation Embrittlement of Cast Austenitic Stainless Steel (CASS) Program. The staff will consider issuing an RAI to resolve this issue. The staff's basis for issuing and resolving this RAI will be discussed in the SER section for this AMP.

In the third topic needing additional clarification, the staff noted that the applicant's Thermal Aging and Neutron Irradiation Embrittlement of CASS Program is a new program that has yet to be implemented at the plant. Since this is a new program, the staff did not have any relevant operating experience events to review on reduction of fracture toughness of the CASS RVI components as a result of thermal aging embrittlement or neutron irradiation embrittlement of the RVI components. However, in order to be consistent with the staff's recommendations in Section A.1.2.3.10, item 2 of SRP-LR Branch Position RLSB-1 (i.e. Branch Position RLSB-1 of Appendix A to NUREG-1800), the staff will consider issuing an RAI requesting that the applicant provide a commitment in the application to submit future operating experience on this AMP to the staff in order to confirm the effectiveness of this program. This RAI will also consider requesting the applicant to discuss and submit any observed material degradation found during the implementation of other existing activities that relate to the aging effects that will be managed by the new program.

The 2 program elements, confirmation process, corrective actions, and administrative controls were audited as part of the Scoping and Screening Methodology audit. During the Aging Management Program audit, the staff compared 8 program elements in the applicant's program and verified that these 8 elements for the AMP were consistent with those specified in GALL AMP XI.M13, except the areas in which the staff felt additional clarification might be warranted as described above.

LRA AMP B.2.41, Thermal Aging Embrittlement of Cast Austenitic Stainless Steel (CASS)

In the Beaver Valley Power Station LRA, the applicant stated that AMP B.2.41 is a new program that will be consistent with the program elements in GALL AMP XI.M12, "Thermal Aging Embrittlement of Cast Austenitic Stainless Steel (CASS)." The applicant's program is credited to manage reduction of fracture toughness that may occur in CASS piping, piping components (including CASS valve bodies and pump casings), and piping elements in the reactor coolant pressure boundary (RCPB) as a result of thermal aging embrittlement.

During its audit, the staff audited the applicant's on-site documentation to determine whether the program elements in the applicant's AMP are consistent with the elements in the GALL report program. The staff interviewed the applicant's technical staff and audited the following additional on-site documents and NRC-issued documents listed below:

DOCUMENT NUMBER	TITLE	REVISION /DATE
LRBV-PED-XI.M12	Thermal Aging and Neutron Irradiation Embrittlement of Cast Austenitic Stainless Steel (CASS)	Rev.3 / July 26, 2007
NRC Letter of May 19, 2000 from C Grimes(NRC) to D. J. Walter (NEI)	License Renewal Issue No., 98-0030, "Thermal Aging Embrittlement of Cast Austenitic Stainless Steel Component	
NUREG/CR-4513	Estimation of Fracture Toughness of Cast Stainless Steels During Thermal Aging in LWR Systems	Rev. 1 / May 1994
LRBV-AMPB-001	Aging Management Common Information	August 6, 2007

Specifically, the staff audited the program element descriptions for the "scope of program," "preventative actions," "parameters monitored/detected," "detection of aging effects," "monitoring and trending," "acceptance criteria," "corrective actions," and "operating experience," program elements in the applicant program against the corresponding program element descriptions that are defined and described in GALL AMP XI.M12, "Thermal Aging Embrittlement of Cast Austenitic Stainless Steel (CASS)."

The staff's review of the "confirmatory actions," and "administrative controls" program elements were performed as part of the staff's review of the quality assurance program for the LRA.

The staff felt that the following two (2) topics required additional clarification and in which requests for additional information (RAI) will be considered to be issued. The staff's evaluation will be documented in the SER.

In the first topic needing additional clarification, the staff was aware that the current state-of-the-art ultrasonic testing (UT) methods in the industry are incapable of distinguishing between UT indication signals that arise from relevant flaw indications in CASS components and those that arise as background noise signals as a result of the complexity in the CASS grain structure (i.e., CASS microstructure). The staff sought clarification from the applicant on the alternative inspection methods that would be used if the current state-of-the-art UT methods remained inadequate for CASS materials, and decided to consider issuing an RAI to resolve this issue.

The staff's basis for issuing and resolving this RAI will be discussed in the SER section for this AMP.

In the second topic needing additional clarification, the staff noted that the applicant's Thermal Aging and Neutron Irradiation Embrittlement of CASS Program is a new program that has yet to be implemented at the plant. Since this is a new program, the staff did not have any relevant operating experience events to review on reduction of fracture toughness of the CASS RVI components as a result of thermal aging embrittlement or neutron irradiation embrittlement of the RVI components. However, in order to be consistent with the staff's recommendations in Section A.1.2.3.10, item 2 of SRP-LR Branch Position RLSB-1 (i.e. Branch Position RLSB-1 of Appendix A to NUREG-1800), the staff will consider issuing an RAI requesting that the applicant provide a commitment in the application to submit future operating experience on this AMP to the staff in order to confirm the effectiveness of this program. This RAI will also consider requesting the applicant to discuss and submit any observed material degradation found during the implementation of other existing activities that relate to the aging effects that will be managed by the new program.

The 2 program elements, corrective actions, confirmation process and administrative controls were audited as part of the Scoping and Screening Methodology audit. During the Aging Management Program audit, the staff compared 8 program elements in the applicant's program and verified that these 8 elements for the AMP were consistent with those specified in GALL AMP XI.M12, except for the areas in which the staff felt additional clarification might be warranted as described above.

LRA AMP B.2.42, Water Chemistry Program

In the LRA, the applicant stated that AMP B.2.42 is an existing program that, following enhancement, will be consistent with GALL AMP XI.M2, "Water Chemistry."

During its audit, the staff audited the applicant's on-site documentation supporting the applicant's conclusion that the program elements are consistent with the elements in the GALL AMP. The staff interviewed the applicant's technical staff and audited the following on-site documents.

DOCUMENT NUMBER	TITLE	REVISION /DATE
LRBV-PED-XI.M2	Beaver Valley Power Station Water Chemistry Program (Unit 1 and Unit 2)	Rev. 3, 2/01/08
1/2-ADM-1710	Sample Retention	Rev. 0
1/2-ADM-1711	Secondary Water Chemistry Monitoring Program	Rev. 7, 9/20/06
1/2-ADM-1712	Primary Systems Chemistry Monitoring Program	Rev. 4, 9/20/06
1/2-ADM-1730	Laboratory Quality Assurance And Quality Control Program	Rev. 8, 10/25/06
1/2-ADM-1732	Corrective Actions	Rev. 0

In comparing the elements in the applicant's AMP to those in GALL AMP XI.M2, the staff found that the applicant has taken an enhancement as follows:

Add into the "Monitoring and Trending" element, revised procedures for sampling frequency for reactor coolant silica monitoring to comply with EPRI guidelines.

The staff finds that this enhancement brings the BVPS Water Chemistry AMP B.2.42 into consistency because it specifies the latest EPRI guidelines for sampling RCS silica which is now 1/week for Modes 1 and 1/day during heatup in Modes 3 and 4.

The staff also audited the operating experience reports, including a sample of condition reports, and interviewed the applicant's technical staff to confirm that the plant-specific operating experience did not reveal any degradation not bounded by industry experience.

The 3 program elements, corrective actions, confirmation process and administrative controls were audited as part of the Scoping and Screening Methodology audit. During the Aging Management Program audit, the staff compared 7 program elements in the applicant's program and verified that these 7 elements for the AMP were consistent with those specified in GALL AMP XI.M2.

Letter to P. Sena III from K. Howard, dated November 05, 2008

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Beaver Valley Power Station, Units 1 and 2

cc:

Joseph J. Hagan
President and Chief Nuclear Officer
FirstEnergy Nuclear Operating Company
Mail Stop A-GO-19
76 South Main Street
Akron, OH 44308

James H. Lash
Senior Vice President of Operations
and Chief Operating Officer
FirstEnergy Nuclear Operating Company
Mail Stop A-GO-14
76 South Main Street
Akron, OH 44308

Danny L. Pace
Senior Vice President, Fleet Engineering
FirstEnergy Nuclear Operating Company
Mail Stop A-GO-14
76 South Main Street
Akron, OH 44308

Jeannie M. Rinckel
Vice President, Fleet Oversight
FirstEnergy Nuclear Operating Company
Mail Stop A-GO-14
76 South Main Street
Akron, OH 44308

Paul A. Harden
Vice President, Nuclear Support
FirstEnergy Nuclear Operating Company
Mail Stop A-GO-14
76 South Main Street
Akron, OH 44308

David W. Jenkins, Attorney
FirstEnergy Corporation
Mail Stop A-GO-15
76 South Main Street
Akron, OH 44308

Manager, Fleet Licensing
FirstEnergy Nuclear Operating Company
Mail Stop A-GO-2
76 South Main Street
Akron, OH 44308

Director, Fleet Regulatory Affairs
FirstEnergy Nuclear Operating Company
Mail Stop A-GO-2
76 South Main Street
Akron, OH 44308

Manager, Site Regulatory Compliance
FirstEnergy Nuclear Operating Company
Beaver Valley Power Station
Mail Stop A-BV-A
P.O. Box 4, Route 168
Shippingport, PA 15077

Regional Administrator, Region I
U.S. Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, PA 19406

Resident Inspector
U.S. Nuclear Regulatory Commission
P.O. Box 298
Shippingport, PA 15077

Cliff Custer
FirstEnergy Nuclear Operating Company
Beaver Valley Power Station
P.O. Box 4, Route 168
Shippingport, PA 15077

Steve Dort
FirstEnergy Nuclear Operating Company
Beaver Valley Power Station
P.O. Box 4, Route 168
Shippingport, PA 15077

Mike Banko
FirstEnergy Nuclear Operating Company
Beaver Valley Power Station
P.O. Box 4, Route 168
Shippingport, PA 15077