

November 24, 2008

Mr. Michael P. Gallagher
Vice President License Renewal Projects
AmerGen Energy Company, LLC
200 Exelon Way
Kennett Square, PA 19348

SUBJECT: AUDIT REPORT REGARDING THE THREE MILE ISLAND NUCLEAR
STATION, UNIT 1, LICENSE RENEWAL APPLICATION (TAC NO. MD7701)

Dear Mr. Gallagher:

By letter dated January 8, 2008, AmerGen Energy Company, LLC submitted an application pursuant to 10 CFR Part 54 to renew the operating license for Three Mile Island Nuclear Station, Unit 1, for review by the U.S. Nuclear Regulatory Commission (NRC or the staff). On August 1, 2008, the staff completed the on-site audit of aging management programs. The audit report is enclosed.

If you have any questions, please contact me at 301-415-2878 or by e-mail at Jay.Robinson@nrc.gov.

Sincerely,

IRA

Jay Robinson, Sr. Project Manager
Projects Branch 1
Division of License Renewal
Office of Nuclear Reactor Regulation

Docket No. 50-289

Enclosure:
As stated

cc w/encl: See next page

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ADAMS Accession No.: ML082880003

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DATE	10/30/08	11/5/08	11/3/08	11/5/08	11/24/08

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Letter to AmerGen Energy Company, LLC from J. Robinson dated November 24, 2008

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SUBJECT: AUDIT REPORT REGARDING THE THREE MILE ISLAND NUCLEAR
STATION, UNIT 1, LICENSE RENEWAL APPLICATION (TAC NO. MD7701)

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SLopas

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Unit 1

- 2 -

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U.S. NUCLEAR REGULATORY COMMISSION

OFFICE OF NUCLEAR REACTOR REGULATION, DIVISION OF LICENSE RENEWAL

Docket No: 050-00289

License No: DPR-050

Licensee: Amergen Energy Company, LLC

Facility: Three Mile Island Nuclear Station, Unit 1

Location: P.O. Box 480
Middletown, PA 17057

Dates: July 21 – 23, 2008
July 28 – August 1, 2008

Reviewers: J. Robinson, Sr. Project Manager, Division of License Renewal (DLR)
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R. Auluck, Branch Chief, DLR
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Approved By: Rajender Auluck, Chief
Engineering Review Branch 2
Division of License Renewal

Jerry Dozier, Chief
Engineering Review Branch 1
Division of License Renewal

Introduction

An eight day audit was conducted by the Nuclear Regulatory Commission (NRC) at the Three Mile Island Nuclear Station, Unit 1 (TMI-1), (the plant) in Middletown, PA on July 21 – 23, 2008, and on July 28 – August 1, 2008. The purpose of this audit was to examine the Amergen Energy Company's, LLC, (the applicant) aging management programs (AMPs) and related documentation for TMI-1 and to verify the applicant's claim of consistency with the corresponding Generic Aging Lessons Learned (GALL) Report (NUREG-1801, Rev. 1) AMPs. As described in the GALL report, the NRC staff's (or the staff) evaluation of the adequacy of each generic AMP is based on its review of the following 10 program elements in each AMP: 1) scope of program; 2) preventative actions; 3) parameters monitored or inspected; 4) detection of aging effects; 5) monitoring and trending; 6) acceptance criteria; 7) corrective actions; 8) confirmation process; 9) administrative controls; and 10) operating experience.

Exceptions to the GALL AMP elements will be evaluated separately as part of the staff's review of the TMI-1 license renewal application (LRA) and documented in the staff's Safety Evaluation Report.

The Standard Review Plan (SRP) for Review of License Renewal Applications for Nuclear Power Plants (NUREG-1800, Rev. 1), provides the staff guidance for reviewing a LRA. The SRP allows an applicant to reference in its LRA, the AMPs described in the 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 Report program, it is incumbent on the applicant to ensure that the plant program contains all of the elements of the referenced GALL Report program. The applicant's determination should be documented in an auditable form and maintained on-site.

During this audit, the staff audited AMP elements 1-6, & 10 (scope of program, preventative actions, parameters monitored or inspected, detection of aging effects, monitoring and trending, acceptance criteria, and operating experience). These elements of the applicant's AMPs were claimed to be consistent with the GALL Report and were audited against the related elements of the associated AMP described in the GALL Report, unless otherwise indicated in this audit report. Elements 7-9 (corrective actions, confirmation process, and administrative controls), were audited during the Scoping and Screening Methodology audit conducted on May 19 – 22, 2008, and are evaluated separately (see ADAMS Accession No. ML083240245). The staff 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 LRA, program bases documents and related references, interviewed various applicant representatives, and conducted walkdowns of several plant areas. In total, 35 AMPs were reviewed and 23 breakout (discussion) sessions with applicant representatives were conducted. This report documents the staff's activities during this audit.

LRA AMP B.2.1.1, ASME Section XI In-service Inspection, Subsections IWB, IWC, and IWD Program

In the TMI-1, LRA, the applicant stated that AMP B.2.1.1 is an existing program that is consistent with the program elements in the GALL Report AMP XI.M1, “American Society of Engineers (ASME) Section XI, In-service Inspection (ISI), Subsections IWB, IWC, and IWD,” with 2 exceptions.

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

Document Number	Title	Revision/Date
TM-PBD-AMP-B.2.1.1	Program Basis Document (PBD), ASME Section XI In-service Inspection, Subsections IWB, IWC, and IWD	Rev. 1
Issue Report 706531	Containment Liner Degradation Historical Performance	N/A
Issue Report 182877	Pressurizer Surge Line Weld SR-0010BM has 2 UT indications	N/A
None	Three Mile Island Nuclear Station Unit 1, ISI Program Plan, Third Ten-Year Inspection Interval	Rev. 5
None	Three Mile Island Nuclear Station Unit 1, ISI Selection Document, Third Ten-Year Inspection Interval	Rev. 2
Issue Report 187903	Leak on the Lower Heater Bundle of Pressurizer	N/A
Issue Report 108535	Current ASME Code Not Referenced in NDE Procedure	N/A
Issue Report 543358	VT-2 Exams Not Documented per ASME Code	N/A
Issue Report 618173	Implement MRP-192-DH Mixing Tee Thermal Fatigue	N/A
Issue Report 692798	ISI-T1R17 RB Exposed Liner at Moisture Barrier Corrosion	N/A
Issue Report 726078	Work Order Packages Do Not Contain VT-2 Records	N/A
Issue Report 696709	Additional Corrosion Identified on RB Metal Liner	N/A
Issue Report 694126	RB Penetrations 210 & 211 Interior Side Paint Degraded	N/A
Issue Report 708197	Risk Informed ISI Weld Categorization Discrepancies	N/A

In comparing the elements in the applicant’s AMP to those in the GALL Report AMP XI.M1, the staff found two exceptions between the applicants AMP and the GALL Report AMP.

In the LRA, the applicant stated that NUREG-1801 specifies the 2001, including the 2002 and 2003 Addenda for Subsections IWB, IWC, and IWD. The TMI-1 ISI Program Plan for the third

ten-year inspection interval effective from April 20, 2001 through April 19, 2011, approved per 10 CFR 50.55a, is based on the 1995 ASME Section XI Boiler and Pressure Vessel (B&PV) Code, including 1996 addenda. The next 120-month inspection interval for TMI-1 will incorporate the requirements specified in the version of the ASME Code incorporated into 10 CFR 50.55a twelve months before the start of the inspection interval.

The staff noted that the ASME Code Section XI editions and addenda referenced by the applicant are different than those described in the GALL Report program for the third ISI period, which is within the current licensing period, and, therefore, the GALL Report guidance does not apply. The staff approved this current ISI program under the 10 CFR 50.55a process. As stated by the applicant during the audit, "The next 120-month inspection interval for TMI-1 will incorporate the requirements specified in the version of the ASME Code incorporated into 10 CFR 50.55a twelve months before the start of the inspection interval," and, therefore, the staff concludes that their program will be in accordance with the GALL Report in the period of extended operation and there is no exception to the GALL Report. The staff will consider issuing a request for additional information (RAI) requesting the applicant address this issue. A discussion of the issue and the results of the staff's review of the applicant's response to the RAI will be provided in the forthcoming Safety Evaluation Report (SER).

In the LRA, the applicant stated that NUREG-1801 specifies the use of ASME Section XI B&PV Code, which includes requirements for examining Class 1 Category B-F and B-J, and Class 2 C-F-1 and C-F-2 piping components. At TMI-1, an alternate method approved in accordance with 10 CFR 50.55a is used to determine the inspection frequency for Class 1 Category B-F and B-J, and Class 2 Category C-F-1 and C-F-2 welds in accordance with 10 CFR 50.55a(a)(3)(I) by alternatively providing an acceptable level of quality and safety. This method also addresses volumetric examination of welds less than nominal pipe size 4 inches. Other portions of the ASME Section XI ISI program outside of this scope remain unaffected.

The staff noted that the applicant uses Risk Informed In-service Inspection (RI-ISI) to determine inspection frequency. Code Case N-700 has been approved by the NRC (see Regulatory Guide (RG) 1.147, Rev. 14). RI-ISI and use of specific Code Cases have been approved by the staff under the 10 CFR 50.55a process for the current ISI program. The applicant's program will be in accordance with the GALL Report in the period of extended operation. Therefore, there is no exception to the GALL Report. The staff will consider issuing an RAI requesting that the applicant address this issue. A discussion of the issue and the results of the staff's review of the applicant's response to the RAI will be provided in the forthcoming SER.

The staff found that there are nine actions documented in Action Request (AR) Number 00706531 that will address containment liner corrosion. Although these actions are projected to be completed in 2008, there is no firm completion date. Since container liner corrosion has been an ongoing problem since the early 1990s, a firm date for completion is warranted.

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

In conclusion, the staff compared 7 of the 10 elements (as discussed in paragraph 4 on page 2 of this report) in the applicant's AMP and verified that those 7 elements are consistent with those recommended in GALL Report AMP XI.M1, not including any exceptions identified by the applicant in the LRA for this AMP, and the areas in which the staff felt additional clarification might be warranted as described above, which will be discussed in the forthcoming SER.

LRA AMP B.2.1.2, Water Chemistry

In the TMI-1 LRA, the applicant stated that AMP B.2.1.2 is an existing program that, with an enhancement, will be consistent with the GALL Report AMP XI.M2, "Water Chemistry."

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

Document Number	Title	Revision/Date
TM-PBD-AMP-B.2.1.2	Program Basis Document - Water Chemistry	Rev. 1
CY-AP-120-1005	Primary Strategic Water Chemistry Plan for Once Through Steam Generator Plants	Rev. 2
CY-AP-120-105	Reactor Coolant System Chemistry for Three Mile Island	Rev. 4
CY-AP-120-110	Chemical volume Control/Makeup and Purification System Chemistry	Rev. 5
CY-AP-120-130	Accumulators/Core Flooding Tanks	Rev. 2
CY-AP-120-170	Refueling Water Storage Tank/Borated Water Storage Tank Chemistry	Rev. 4
CY-AP-120-2005	Secondary Strategic Water Chemistry Plan for Once Through Steam Generator Plants	Rev. 1
CY-AP-120-205	Once Through Steam Generator Chemistry	Rev. 2
CY-AP-120-215	Condensate/Feedwater Chemistry for Once Through Steam Generators	Rev. 3
CY-AP-120-240	Condensate Storage Tank Chemistry	Rev. 4
CY-AP-120-3005	PWR Shutdown Chemistry for Once Through Steam Generators	Rev. 1
CY-AP-120-3105	PWR Startup Chemistry for Once Through Steam Generators	Rev. 1
Issue Report 111882	Action Request – Feedwater Sodium Exceeded Action Level 1	06/13/02
FASA AT#: 195336	Focused Area Self-Assessment Report: RCS or Reactor Water Chemistry Control	03/23/04 – 03/26/04
Issue Report 491082	Elevated Chlorides in RCS	05/17/06
Issue Report 362976	Rising Dissolved Oxygen Trend in Feedwater	08/15/05

In comparing the elements in the applicant's AMP to those in the GALL Report AMP XI.M2, the staff found that the program elements were consistent between the two with one enhancement to the applicants AMP, which is to include continuous monitoring of steam generator blowdown for sodium during startup, and hot standby conditions in accordance with the guidelines established in Electric Power Research Institute (EPRI) Report 1008224, "PWR Secondary Water Chemistry Guidelines," Revision 6, December 2004. The applicant stated that this enhancement will be implemented after replacement of the existing once-through steam generators and prior to the period of extended operation. Further discussion of this issue will be included in the forthcoming SER.

The staff identified that the applicant claimed that its Water Chemistry Program is consistent with the GALL Report which recommends that a Pressurized Water Reactor (PWR) primary water chemistry program be based on EPRI Topical Report (TR)-105714, PWR Primary Water Chemistry Guidelines – Revision 3, or later. The applicant also stated that its primary water chemistry program is based on EPRI TR-1002884, Pressurized Water Reactor Primary Water Chemistry Guidelines, Revision 5, which is the most recent revision of EPRI TR-105714. However, the staff noted some differences between requirements in the applicant's implementing procedures and recommendations in EPRI TR-1002884. The staff expects to issue an RAI requesting the applicant explain why the differences are not considered exceptions to the GALL report and to provide technical justification that the differences between the applicant's program and the EPRI guidance document are acceptable. A discussion of the issue and the results of the staff's review of the applicant's response to the RAI will be provided in the forthcoming SER.

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

In conclusion, the staff compared 7 of the 10 elements (as discussed in paragraph 4 on page 2 of this report) in the applicant's program and verified that those 7 elements are consistent with those recommended in GALL Report AMP XI.M2, except for the areas in which the staff felt additional clarification might be warranted as described above.

LRA AMP B.2.1.3, Reactor Head Closure Studs

In the TMI-1 LRA, the applicant stated that AMP B.2.1.3 is an existing program that is consistent with the GALL Report AMP XI.M3, "Reactor Head Closure Studs" with 2 exceptions that are related to an ASME code edition change. TMI-1 uses the 1995 edition including 1996 addenda.

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

Document Number	Title	Revision/Date
TM-PBD-AMP-B.2.1.3	Program Basis Document - Reactor Head Closure Studs	Rev. 1
TMI-ISI-BASIS	ISI Program Plan- Third Ten-Year Inspection Interval	Rev. 5
TMI Refueling Procedure 1504-10	Reactor Vessel Studs, Nuts and Washers Inspection and Cleaning	Rev. 14
MA-TM-134-904	Reactor Vessel Reassembly	Rev. 4
INPO Operating Experience 5093	Ultrasonic Examination Indications in Reactor Pressure Vessel (RPV) Head Studs	11/23/91
INPO Operating Experience 14701	Reactor Pressure Vessel Closure Head Nuts	10/02/02
INPO Operating Experience 9056	Fluorescent/Visible Magnetic Particle Examination Method Found Incapable of Detecting Cracks on Test Specimen	05/07/98
INPO Operating Experience 21324	(Perry) Potential Weakness in Surface Examinations of RPV Closure Studs	03/13/05

In comparing the elements in the applicant's AMP to those in the GALL Report AMP XI.M18, the staff found that the GALL Report "scope of program" and "detection of aging effects" program elements recommending detection of coolant leakage were not specifically identified as items that would be inspected in the applicant's basis documents. Additionally, the staff found that although the LRA claimed that the AMP was consistent with the GALL Report AMP, there appeared to be an exception related to the "preventive actions" program element in regards to lubricant usage. One of the lubricants used by TMI-1 contains the compound molybdenum disulfide, which is discouraged from use by EPRI Report NP-5769. The staff will consider issuing RAIs requesting that the applicant address these issues. A discussion of these issues and the results of the staff's review of the applicant's response to the RAIs will be included in the forthcoming SER.

The staff also reviewed the operating experience reports, including a sample of issue reports, and interviewed the applicant's technical staff and confirmed that the plant-specific operating experience did not reveal any degradation not bounded by industry experience. The reports indicated that during recent refueling outages in 2003 and 2005, Ultrasonic Testing (UT), Magnetic Particle, and Visual Examination exams were conducted which found no undesirable indications. No undesirable indications have ever been recorded on the reactor head closure studs at TMI-1, however, TMI-1 does utilize industry operating experience to supplement their

own AMP by reviewing industry recommendations and evaluations to address issues that have occurred at other plants which were audited by the staff.

In conclusion, the staff compared 7 of the 10 elements (as discussed in paragraph 4 on page 2 of this report) in the applicant's program and verified that those 7 elements are consistent with those recommended in GALL Report AMP XI.M3, not including any exceptions identified by the applicant for this AMP, and the areas in which the staff felt additional clarification might be warranted as described above, which will be discussed in the forthcoming SER.

LRA AMP B.2.1.4, Boric Acid Corrosion Program

In the TMI-1 LRA, the applicant stated that AMP B.2.1.4 is an existing program that is consistent with the GALL Report AMP XI.M10, "Boric Acid Corrosion."

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

Document Number	Title	Revision/Date
TM-PBD-AMP-B.2.1.4	Program Basis Document - Boric Acid Corrosion	Rev. 1
ER-AP-331	Boric Acid Corrosion Control (BACC) Program	Rev. 3
ER-AP-331-1001	BACC Inspection Locations, Implementation and Inspection Guidelines	Rev. 2
ER-AP-331-1002	BACC Identification, Screening and Evaluation	Rev. 3
Issue Report 552691	Active Leakage from Fitting	02/09/07
Issue Report 690619	Boric Acid Identified on Bottom of Pressurizer	11/28/07
5928-01-20362	TMI-1 Response to Bulletin 2001-01	01/07/02
5928-02-20167	TMI-1 30-day response to Bulletin 2002-02	09/11/02
5928-03-20238	TMI-1 Response to RAIs for Bulletin 2002-01	01/21/03
5928-04-20019	TMI-1 60-day Response to Bulletin 2003-02	01/22/04
5928-04-20180	TMI-1 Response to Bulletin 2004-01	07/27/04

In comparing the elements in the applicant's AMP to the GALL Report AMP XI.M10, the staff could not determine whether all the components, including all Class 1 nickel alloy locations as per NRC Order EA-03-009 and Bulletins 2003-02 and 2004-01 were included in the scope of this program for visual inspection. The staff will consider issuing an RAI requesting that the applicant address this issue. A discussion of the issue and the results of the staff's review of the applicant's response to the RAI will be included in the forthcoming SER.

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

In conclusion, the staff compared 7 of the 10 elements (as discussed in paragraph 4 on page 2 of this report) in the applicant's program and verified that those 7 elements are consistent with those recommended in GALL Report AMP XI.M10, except for the areas in which the staff felt additional clarification might be warranted as described above.

LRA AMP B.2.1.5, Nickel-Alloy Penetration Nozzles Welded to the Upper Reactor Vessel Closure Head Program

In the TMI-1 LRA, the applicant stated that AMP B.1.2.5 is an existing program that is consistent with the program elements in the GALL Report AMP XI.M11, “Nickel-Alloy Penetration Nozzles Welded to the Upper Reactor Vessel Closure Head.”

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

Document Number	Title	Revision/Date
TM-PBD-AMP-B.2.1.5	TMI-1 Nickel-Alloy Penetration Nozzle Welded to the Upper Reactor Vessel Closure Head of Pressurized Water Reactors Program	Rev. 1
Engineering Change Request: 02-01410	Reactor Vessel Closure Head Replacement	Rev. 2
Order EA 03-009	Issuance of Order Establishing Interim Inspection Requirements for Reactor Pressure Vessel Heads at Pressurized Water Reactors	02/11/03
First Revised Order EA 03-009	Issuance of Revised Order EA-09-003 Establishing Interim Inspection Requirements for Reactor Pressure Vessel Heads at Pressurized Water Reactors	02/20/03

In comparing the elements in the applicant’s AMP to those in the GALL Report AMP XI.M11, the staff found that the program elements between the two are consistent and that the applicant had addressed the relevant TMI-1 operating experience for its upper RVCH and RVCH nozzle examinations.

The staff also reviewed the operating experience reports including a sample of issue reports and interviewed the applicant’s technical staff and confirmed that the plant-specific operating experience did not reveal any degradation not bounded by industry experience.

In conclusion, the staff compared 7 of the 10 elements (as discussed in paragraph 4 on page 2 of this report) in the applicant’s program and verified that those 7 elements are consistent with those recommended in GALL Report AMP XI.M11.

LRA AMP B.2.1.6, Flow-Accelerated Corrosion Program

In the TMI-1 LRA, the applicant stated that AMP B.2.1.6 is an existing program that is consistent with the GALL Report AMP XI.M17, “Flow-Accelerated Corrosion” with one exception.

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

Document Number	Title	Revision/Date
TM-PBD-AMP-B.2.1.6	Program Basis Document - Flow Accelerated Corrosion (FAC)	Rev. 1
ER-AA-430	Conduct of Flow Accelerated Corrosion Activities	Rev. 2
Action Request 00187869	Results of refueling outage 15 FAC Inspections	12/12/04
Action Request 00695230	FAC Component 431-1000-057 found thin (1R17 inspection)	12/06/07
Action Request 00690629	FAC component 422-1004-057 found thin (1R17 inspection)	10/28/07

In comparing the elements in the applicant’s AMP to those in the GALL Report AMP XI.M17, the staff found one exception between the applicants AMP and the GALL Report AMP. The GALL Report AMP XI.M17 indicates that the program relies on implementation of EPRI guideline NSAC-202L-R2 for an effective FAC program. The LRA states that NSAC-202L-R3 is used. The LRA further states that Rev. 2 and Rev. 3 of the guideline are equivalent with one difference: Rev. 3 allows an additional method, Averaged Band Method, for determining the wear of piping components from UT inspection. However, TMI-1 does not use this method at this time.

The program basis document references procedure ER-AA-430, Conduct of Flow Accelerated Corrosion Activities, which utilizes NSAC-202L-R2 as a guideline. The staff will consider issuing an RAI to request if the applicant proposes to enhance the program to specify NSAC-202L-R3 and if it does, will the exception be identified and an explanation provided as to how the additional method will be controlled in the future. A discussion of the issue and the results of the staff’s review of the applicant’s response to the RAI will be provided in the forthcoming SER.

The GALL Report AMP in the “monitoring and trending” element recommends that inspection results be evaluated to determine if additional inspections are needed, but this issue was not fully addressed in the applicants AMP. The staff will consider issuing an RAI to request that the applicant provide the criteria used to determine when additional sampling is required. A discussion of the issue and the results of the staff’s review of the applicant’s response to the RAI will be provided in the forthcoming SER.

Table 3.4-2 in the SRP-LR provides an example of the Final Safety Analysis Report (FSAR) Supplement for the FAC Program and identifies implementation guidelines NSAC-202L-R2. LRA Section A.2.1.6 does not identify a revision number for NSAC-202L. The staff will consider issuing an RAI to address this issue. A discussion of the issue and the results of the staff’s review of the applicant’s response to the RAI will be provided in the forthcoming SER.

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

In conclusion, the staff compared 7 of the 10 elements (as discussed in paragraph 4 on page 2 of this report) in the applicant's program and verified that those 7 elements are consistent with those recommended in GALL Report AMP XI.M10, except for the exceptions identified by the applicant in the LRA for this AMP, and the areas in which the staff felt additional clarification might be warranted as described above, which will be discussed in the forthcoming SER.

LRA AMP B.2.1.7, Bolting Integrity

In the TMI-1 LRA, the applicant stated that AMP B.2.1.7 is an existing program that is consistent with the GALL Report AMP XI.M18, "Bolting Integrity."

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

Document Number	Title	Revision/Date
TM-PBD-AMP-B.2.1.07	Program Basis Document - Bolting Integrity	Rev. 1
EPRI-1013550	EPRI- Nuclear Maintenance Application Center: Bolting Guides Consolidation Review	11/06
TMI-ISI-BASIS	ISI Classification Basis Document- Third Ten Year Inspection Interval	09/13/06
1410-Y-40	Sheet Gasket Removal and Installation	Rev. 11
1410-Y-72	Bolt/Nut Torquing and Sequences	Rev. 20
Action Request 00354400	EG-Y-1B Exhaust Manifold Leaks	07/19/05
Action Request 00614589	Loose Bolting on EG-Y-1B Exhaust Manifolds	04/08/07
Action Request 00296659	Possible Improper Thread Engagement / DH-P-1A	02/02/05

In comparing the elements in the applicant's AMP to those in the GALL Report AMP XI.M18, the staff found that that the program elements between the two are consistent.

In the GALL Report "monitoring and trending" program element, it is recommended that the leak rate be monitored on a particularly defined schedule. The staff noted that the schedule was not properly documented in the applicants AMP. The staff will consider issuing an RAI requesting that the applicant address this issue. A discussion of the issue and the results of the staff's review of the applicant's response to the RAI will be provided in the forthcoming SER.

The staff also reviewed the operating experience reports, including a sample of issue reports, and interviewed the applicant's technical staff and confirmed that the plant-specific operating experience did not reveal any degradation not bounded by industry experience. An issue report indicated that in 2002, a loose nut was discovered on the pump frame of the decay heat removal pump. The staff found that proper corrective actions were taken to address the issue including an action requiring the inspection of a sample of safety related and non-safety related bolts or nuts.

In conclusion, the staff compared 7 of the 10 elements (as discussed in paragraph 4 on page 2 of this report) in the applicant's program and verified that those 7 elements are consistent with those recommended in the GALL Report AMP XI.M18, except for the areas in which the staff felt additional clarification might be warranted as described above.

LRA AMP B.2.1.9, Open-Cycle Cooling Water System

In the TMI-1 LRA, the applicant stated that AMP B.2.1.9 is an existing program that, with an enhancement, will be consistent with the GALL Report AMP XI.M20, "Open-Cycle Cooling Water System," with exceptions and one enhancement.

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

Document Number	Title	Revision/Date
TM-PBD-AMP-B.2.1.9	Program Basis Document - Open-Cycle Cooling Water (CCW) System	Rev. 2
TR 119	Generic Letter 89-13 Program Description	Rev. 4
TR 117	Microbiologically Influenced Corrosion (MIC) Program Description	Rev. 1
CY-AA-120-4110	Raw Water Chemistry Strategic Plan	Rev. 2
6510-SUR-4515.03	TMINS Asiatic Clam Surveillance	Rev. 3
1104-65	River and Circulating Water System Macrofouling Treatment	Rev. 23
ER-AA-2030	Conduct of Plant Engineering Manual	Rev. 5
ER-TM-340-1002	Guidance for Heat Exchanger Inspections and Cleaning at TMI	Rev. 0
M-25	Inspect Main Condenser Circulating Water Side	Rev. 20
M-25B	Inspect Auxiliary Condenser	Rev. 2
M-164	Station Blackout Diesel Generator Major Inspection	Rev. 15
Action Request 431906	NR-SR cross-connect line has a leak that may be caused by MIC	12/08/05
Action Request 555081	NR-SR cross-connect line has an additional leak	11/08/06
Action Request 367185	Circ. Water corrosion rates higher than expected	07/16/04
None	Database Search Results for Action Requests Related to Open Cycle and River Water Systems	03/27/07

In comparing the elements in the applicant's AMP to those in the GALL Report AMP XI.M20, the staff found an exception and an enhancement when comparing the applicants AMP to the GALL Report AMP.

The exception concerns the use of the AMP to also manage additional aging effects and mechanisms for the internal surfaces of concrete circulating water piping. The applicant stated that the GALL Report AMP's scope consists of preventive measures to mitigate the aging effects of material loss and fouling due to micro- or macro-organisms and various corrosion mechanisms. The additional aging effects/mechanisms to be managed by the AMP are:

1) cracking and expansion due to reaction with aggregates; 2) cracking, loss of bond, and loss of material (spalling, scaling) due to corrosion of embedded steel; 3) increase in porosity and permeability, cracking, loss of material (spalling, scaling) due to aggressive chemical attack; and 4) increase in porosity and permeability, loss of strength due to leaching of calcium hydroxide. The staff will consider issuing one or more RAIs requesting that the applicant address this issue. A discussion of the issue and the results of the staff's review of the applicant's response to the RAI will be provided in the forthcoming SER.

The enhancement is to install a new river water chemical treatment system to treat the river water systems for bio-fouling, including MIC.

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

In conclusion, the staff compared 7 of the 10 elements (as discussed in paragraph 4 on page 2 of this report) in the applicant's program and verified that those 7 elements are consistent with those recommended in GALL Report AMP XI.M20, not including the exceptions identified by the applicant in the LRA for this AMP, which will be discussed in the forthcoming SER.

LRA AMP B.2.1.10, Closed-Cycle Cooling Water System

In the TMI-1 LRA, the applicant stated that AMP B.2.1.10 is an existing program that, with an enhancement, will be consistent with the GALL Report AMP XI.M21, “Closed-Cycle Cooling Water System (CCCW),” with an exception.

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

Document Number	Title	Revision/Date
TM-PBD-AMP-B.2.1.10	Program Basis Document - Closed-Cycle Cooling Water System	Rev. 2
CY-AA-120-4000	Closed Cooling Water [(CCW)] Chemistry Strategic Plan	Rev. 4
CY-AA-120-400	Closed Cooling Water Chemistry	Rev. 10
ER-AA-2030	Conduct of Plant Engineering Manual	Rev. 6
N1816	Closed Cooling Systems Sampling	Rev. 3
None	Planner Instructions – Inspection of Closed Cycle Cooling Water System Components	None
None	Planner Instructions – Inspection of Chemical Mix Tanks	None
Issue Report 155255	DHCC B Molybdate Below Limit During System Flush	04/22/03
N/A	Preventive Maintenance Criteria Forms for Various Components/Equipment Served by the CCW System	N/A
Issue Report 137444	Closed Cooling System Ammonia Exceeded Limit	12/27/02
Issue Report 107601	Decreasing pH Trend Observed on CCW Systems	05/10/02
None	Database Search Results for Action Requests Related to CCW Systems	05/07/07

In comparing the elements in the applicant’s AMP to those in the GALL Report AMP XI.M21, the staff found both an exception and an enhancement between the applicants AMP and the GALL Report AMP. The exception concerns the use of EPRI TR-107396 where the applicant identified use of an EPRI Closed Cooling Water Chemistry Guideline revision that is different from the one recommended in the GALL Report. The LRA states that the GALL Report AMP refers to EPRI TR-107396, “Closed Cooling Water Chemistry Guidelines,” 1997, but that TMI-1 implements the guidance provided in EPRI TR-1007820, which is the 2004 Revision to EPRI TR-107396. The enhancement is that a one-time inspection of selected components in stagnant flow areas will be conducted to confirm the absence of aging effects resulting from exposure to closed cycle cooling water and that a one-time inspection of selected CCCW chemical mix tanks and associated piping components will be performed to verify corrosion has not occurred on the interior surfaces of the tanks and associated piping components. In its review of the applicant’s documents the staff noted that the applicant has prepared a set of “planner instructions” and “PM request criteria forms” that provide guidance for maintenance planners to implement and document the results of the one-time inspections and recurring

preventive maintenance activities that are to be credited for license renewal in the applicant's CCCW program. The staff noted that the planner instructions and PM request criteria forms provide adequate guidance to enable a maintenance planner to appropriately select components to be inspected and to implement appropriate examination/inspection techniques and acceptance criteria based on the potential aging effect being monitored and the component being inspected.

The staff also reviewed the operating experience reports, including a sample of issue reports, and interviewed the applicant's technical staff and confirmed that the plant-specific operating experience did not reveal any degradation not bounded by industry experience

In conclusion, the staff compared 7 of the 10 elements (as discussed in paragraph 4 on page 2 of this report) in the applicant's program and verified that those 7 elements are consistent with those recommended in GALL Report AMP XI.M21, not including the exceptions identified by the applicant in the LRA for this AMP, and the areas in which the staff felt additional clarification might be warranted as described above, which will be discussed in the forthcoming SER.

LRA AMP B.2.1.11, Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems

In the TMI-1 LRA, the applicant stated that AMP B.2.1.11 is an existing program that is consistent with the GALL Report AMP XI.M23, "Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems," with enhancements.

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

Document Number	Title	Revision/Date
TM-PBD-AMP-B.2.1.11	Program Basis Document - Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems	Rev. 0
M-14A.2	Periodic (Yearly) Reactor Building Polar Crane Inspection	Rev. 1
M-14B.2	Periodic (Yearly) Fuel Handling Building Crane Inspection	Rev. 0
M-14C.2	Periodic (Yearly) Turbine Building Crane Inspection	Rev. 1
A2105690-03	Qualification of Polar Crane Rail Supports for SGRP	Rev. 0
ECR-TM-03-00872	Deteriorated Diagonal Braces for R. B. Polar Crane Support (Evaluation)	Rev. 0
Action Request 674908	Action Request - Issues Identified by Corporate Review of Heavy Load Program	09/24/07

In comparing the elements in the applicant's program to those in the GALL Report AMP XI.M23, the staff found that the program elements are consistent between the two with enhancements to the applicants AMP that include guidance in licensee procedures to inspect for loss of material due to wear on rails in the rail system, and inspection for loss of material due to general corrosion, which affects the "scope of program," "parameters monitored or inspected," and the "acceptance criteria" program elements. The staff noted that TMI-1 identified visual inspection as the inspection technique in several plant procedures. The staff asked for clarification on what is included in a visual inspection, as well as inspector training qualifications. Clarification and records were reviewed onsite to ensure that the program adequately met the GALL Report program elements.

The staff also reviewed the operating experience reports, including a sample of issue reports, and interviewed the applicant's technical staff and confirmed that the plant-specific operating experience did not reveal any degradation not bounded by industry experience. The applicant's reports indicate that, in 2003, cracks were discovered in 5 out of 16 pairs of diagonal braces on the reactor building polar crane. An engineering evaluation which determined the diagonal braces were not needed for normal polar crane operation was reviewed by the staff. The staff then questioned whether the diagonal braces would be needed for the planned steam generator

replacement in 2009. TMI-1 will not use the reactor building polar crane for movement of the steam generators. Instead, they will install an auxiliary crane, partially supported by the polar crane rails. The engineering evaluation for this crane was reviewed by the staff during the audit as well.

In conclusion, the staff compared 7 of the 10 elements (as discussed in paragraph 4 on page 2 of this report) in the applicant's program and verified that those 7 elements are consistent with those recommended in GALL Report AMP XI.M23.

LRA AMP B.2.1.12, Compressed Air Monitoring Program

In the LRA, the applicant stated that AMP B.2.1.12 is an existing program that is consistent with GALL AMP XI.M24, “Compressed Air Monitoring,” with enhancements

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

Document Number	Title	Revision and/or Date
TM-PBD-AMP-B.2.1.12	Program Basis Document – Compressed Air Monitoring	Rev. 1
1104-25	Instrument and Control Air System Operating Procedure	Rev. 133
1300-4F	Test of 2-Hour Backup Supply Air System	Rev. 3
ER-AA-2030	Conduct of Plant Engineering Manual	Rev. 5
1041	IST Program Requirements	Rev. 42
Issue Report 228010	Failed PMT on instrument air dryer	06/12/05
Issue Report 221391	Instrument air dryer not working	05/05/05

In comparing the elements in the applicant’s AMP to those in the GALL Report AMP XI.M24, the staff found that the program elements between the two are consistent with enhancements to the applicants AMP that include the following:

1. Inclusion of the instrument air system air quality testing for dew point, particulates, lubricant content, and contaminants to ensure that the contamination standards of ANSI/ISA-S7.0.01-1996, paragraph 5 are met. These enhancements will be made to the existing program GL 88-14 Instrument Air Program.
2. Inclusion of air sampling activities on a representative sampling of headers on a yearly basis in accordance with ASME OM-S/G-1998, Part 17 and EPRI TR-108147.

GALL AMP XI.M24, “Compressed Air Monitoring,” states that program manages the effects of corrosion and presence of unacceptable levels of contaminants on the intended function of the compressed air system. LRA B2.1.12 states that this program manages loss of material due to corrosion and reduction of heat transfer due to fouling. The staff will consider issuing an RAI to request the applicant to explain how its program manages the aging effect of reduction of heat transfer. A discussion of the issue and the results of the staff’s review of the applicant’s response to the RAI will be provided in the forthcoming SER.

GALL AMP XI.M24 in the “monitoring and trending” element states that test data are analyzed and compared to data from previous tests to provide for timely detection of aging effects. The program basis document for this element states that results of tests are compared to established acceptance criteria; however, it is not clear if these results are compared to previous test results to establish a trend. The staff will consider issuing an RAI requesting that the applicant address this issue. A discussion of the issue and the results of the staff’s review of the applicant’s response to the RAI will be provided in the forthcoming SER.

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

In conclusion, the staff compared 7 of the 10 elements (as discussed in paragraph 4 on page 2 of this report) in the applicant's program and verified that those 7 elements are consistent with those recommended in GALL Report AMP XI.M24, except for the areas in which the staff felt additional clarification might be warranted as described above.

LRA AMP B.2.1.13, Fire Protection Program

In the TMI-1 LRA, the applicant stated that AMP B.2.1.13 is an existing program that, following enhancement, will be consistent with the GALL Report AMP XI.M26, "Fire Protection," with an exception.

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

Document Number	Title	Revision/Date
TM-PBD-AMP-B.2.1.13	Program Basis Document - Fire Protection	Rev. 1
1038	Administrative Procedure – Fire Protection Program	Rev. 69
1303-12.9	Fire Barrier Inspection	Rev. 33
1303-12.24	Raceway Fire Barrier Inspection	Rev. 14
1303-12.25	Technical Requirements for Fire Door Inspection and Maintenance	Rev. 4
1303-12.11	Halon System Tests	Rev. 46
1303-12.5	CO ₂ Fire Protection System Tests	Rev. 21
3303-M1	Fire Pump Periodic Operation	Rev. 37
Issue Report 486601	Fire Penetration Seal #17 degraded	05/04/06
Issue Report 127857	CB Metal Clad Fire Wall Discrepancies	10/08/02

In comparing the elements in the applicant's AMP to those in the GALL Report AMP XI.M26, the staff found an exception between the applicants AMP and the GALL Report AMP which involves the frequency of halon and carbon dioxide (CO₂) system functional tests. The GALL Report AMP recommends a frequency of once every six months whereas the applicants AMP is using a frequency of once every eighteen months for halon systems and once every 24 months for CO₂ systems.

The GALL Report AMP XI.M26, Fire Protection, in the "detection of aging effects" element, states that the CO₂ system visual inspection detects any sign of degradation, such as corrosion, mechanical damage, or damage to dampers. TMI-1 PBD, TM-PDP-AMP-B.2.1.13, references Fire Protection Administrative Procedure 1038 for halon and CO₂ system testing, TMI surveillance procedures 1303-12.11 for halon system inspection and 1303-12.5 for CO₂ system inspection. However, the inspection procedures do not clearly state that the system should be inspected for corrosion, mechanical damage or damage to dampers. The staff will consider issuing an RAI requesting that the applicant address this issue. A discussion of the issue and the results of the staff's review of the applicant's response to the RAI will be provided in the forthcoming SER.

The GALL Report AMP XI.M26, "Fire Protection," in the "acceptance criteria" element states any signs of corrosion and mechanical damage of the halon/carbon dioxide fire suppression system are not acceptable. There are no acceptance criteria specified for inspection parameters in the surveillance procedures that are referenced in the fire protection program basis document for halon and CO₂ systems. The staff will consider issuing an RAI requesting that the applicant address this issue. A discussion of the issue and the results of the staff's review of the applicant's response to the RAI will be provided in the forthcoming SER.

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

In conclusion, the staff compared 7 of the 10 elements (as discussed in paragraph 4 on page 2 of this report) in the applicant's program and verified that those 7 elements are consistent with those recommended in GALL Report AMP XI.M26, not including the exceptions identified by the applicant in the LRA for this AMP, and the areas in which the staff felt additional clarification might be warranted as described above, which will be discussed in the forthcoming SER.

LRA AMP B.2.1.14, Fire Water System Program

In the TMI-1 LRA, the applicant stated that AMP B.2.1.14 is an existing program that is consistent with the GALL Report AMP XI.M27, "Fire Water System," with enhancements.

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

Document Number	Title	Revision/Date
TM-PBD-AMP-B.2.1.14	Program Basis Document - Fire Water System	Rev. 1
1038	Administrative Controls – Fire Protection Program	Rev. 69
3391-SA1	Fire Hydrant Inspection	Rev. 26
U-8	Hydrostatic Testing of Hose	Rev. 36
Action Request 748645	Corrosion and Possible Leakage of FS-P-2 Piping	04/11/08

In comparing the elements in the applicant's AMP to those in the GALL Report AMP XI.M27, the staff found that the program elements between the two are consistent with enhancements to the applicants AMP that include the following:

1. Periodic non-intrusive wall thickness measurements of selected portions of the fire water system at intervals not exceeding 10 years.
2. Sampling of sprinklers and submitting the samples to a testing laboratory prior to sprinklers being in service for 50 years and subsequent testing at intervals not exceeding 10 years.

The GALL Report AMP XI.M27, "Fire Water System," in the "acceptance criteria" element, states that no bio-fouling exists in the sprinkler systems that could cause corrosion in the sprinkler heads. In the fire water system program basis document, Section 3.6 (c) states the new inspection activities will include an evaluation of identified fouling. The staff will consider issuing an RAI to determine how this will be accomplished. A discussion of the issue and the results of the staff's review of the applicant's response to the RAI will be provided in the forthcoming SER.

TMI-1 PBD TM-PBD-AMP-B.2.1.14, was reviewed for sampling locations which are identified in Section 3.4.c. Section 3.4.h provides information on sprinkler sampling.

The staff also reviewed the operating experience reports including a sample of issue reports and interviewed the applicant's technical staff and confirmed that the plant-specific operating experience did not reveal any degradation not bounded by industry experience. The staff noted that IR 748645 was issued on April 11, 2008, to document corrosion and possibly leakage of fire protection piping. The cause was determined to be heavy tuberculation of MIC causing excessive internal pitting. IR 635626 indicated that ineffective mitigation of MIC in fire service water system resulted in degradation of important piping, including some through wall leaks.

TMI-1 PBD TM-PBD-AMP-B.2.1.14 states that flow tests are conducted once every three years and are intended to evaluate the condition of internal piping for degradation or fouling. The staff

will consider issuing an RAI requesting the applicant identify what preventive measures TMI-1 proposes to ensure that aging degradation due to MIC is adequately managed during the period of extended operation such that component intended functions are maintained. A discussion of the issue and the results of the staff's review of the applicant's response to the RAI will be provided in the forthcoming SER.

In conclusion, the staff compared 7 of the 10 elements (as discussed in paragraph 4 on page 2 of this report) in the applicant's program and verified that those 7 elements are consistent with those recommended in GALL Report AMP XI.M27, except for the areas in which the staff felt additional clarification might be warranted as described above.

LRA AMP B.2.1.15, Aboveground Steel Tanks

In the TMI-1 LRA, the applicant stated that AMP B.2.15 is a new program that when implemented will be consistent with the GALL Report AMP XI.M29, "Aboveground Steel Tanks," with exceptions and enhancements.

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

Document Number	Title	Revision/Date
TM-PBD-AMP-B.2.1.15	Program Basis Document - Aboveground Tanks	Rev. 1
Procedure 1410-T-1	Corrective Maintenance Procedure – Tank Inspection	Rev. 16
TMI-1 Drawing 1 (69-4476U)	48-0 & 20-0 High Dome Roof Tank Condensate Storage Tank	Rev. 4
TMI-1 Specifications SP-1101-53-022	Specifications for FS-T-0001 Altitude Tank Coating	Rev. 0
TMI-1 Specification SP-9000-06-003	Application and Repair of Service Level II and Balance of Plant Coatings	Rev. 4
Issue Report 343601	Minor External Paint Blisters and Missing Chips on FS-T-1	06/13/05
Action Request A2143854	FS Altitude Tank External Inspection	11/16/06
Action Request A2138328	RX Sodium Tanks & Recirc Pump, BS-P-0002, BS-T-1/2	05/15/07
Action Request 636956	Piping Insulation Missing in FS-T-1	06/04/07
Action Request A596226	Inspect & Clean So-T-3 (H2 Detraining Tank)	02/26/07

In comparing the elements in the applicant's AMP to those in the GALL Report AMP XI.M29, the staff noted an exception and an enhancement between the applicants AMP and the GALL Report AMP. The exception is related to the frequency in which the system walkdown of the tanks would be performed. The LRA indicated the GALL Report states that periodic plant system walkdowns each outage are used to monitor degradation but that the TMI-1 program utilizes tank inspections are least every five years in place of periodic system walkdowns each outage. The staff will consider issuing an RAI requesting that the applicant address this issue. A discussion of the issue and the results of the staff's review of the applicant's response to the RAI will be provided in the forthcoming SER.

The enhancement is to include one-time thickness measurements of the bottom of the Condensate Storage Tanks to ensure that significant degradation is not occurring and the component intended function will be maintained during the period of extended operation.

The staff noted during its review that it appears the Sodium Thiosulfate Tank fabricated of stainless steel is within the scope of this program, however, in TMI-1 PBD TM-PBD-AMP-

B.2.1.15, this tank is not referred to, nor are any stainless steel tanks. The staff will consider issuing an RAI requesting that the applicant address this issue. A discussion of the issue and the results of the staff's review of the applicant's response to the RAI will be provided in the forthcoming SER.

During the audit, the staff also noted that the paint/coatings and sealants/caulkings are to be inspected as part of this AMP. However, in LRA Section 3, there did not appear to be any line items with these materials that credit this AMP. The staff felt that additional information was needed in terms of which program these materials would be inspected under. The staff will consider issuing an RAI requesting that the applicant address this issue. A discussion of the issue and the results of the staff's review of the applicant's response to the RAI will be provided in the forthcoming SER.

The staff also reviewed the operating experience reports including a sample of issue reports and interviewed the applicant's technical staff and confirmed that the plant-specific operating experience did not reveal any degradation not bounded by industry experience. The review indicated that in June of 2005, blistering and missing paint on the Altitude Tank was discovered, however, there was no indication of rust or leaks. A recurring task to have this tank inspected on an annual basis has been implemented with the latest inspection being performed in June of 2007. The inspection results indicated that the tank did not have significant corrosion and had not further degraded from the previous year, but it did indicate that pieces of insulation were missing from several piping locations on the upper and lower platform level. The applicant noted mild to no rust conditions were in those areas, where insulation was missing. The staff further noted during the latest inspection in June 2008, that the corrosion on the tank where the insulation is missing, was not significant. Work to address this issue is planned to occur during the next refueling outage scheduled for Fall of 2009. The staff noted that the applicant has been capable of identifying corrosion, has taken corrective actions to inspect this tank yearly to trend any degradation and has work scheduled to address the missing insulation.

In conclusion, the staff compared 7 of the 10 elements (as discussed in paragraph 4 on page 2 of this report) in the applicant's program and verified that those 7 elements are consistent with those recommended in GALL Report AMP XI.M29, except for the exceptions identified by the applicant in the LRA for this AMP, and the areas in which the staff felt additional clarification might be warranted as described above, which will be discussed in the forthcoming SER.

LRA AMP B.2.1.16, “Fuel Oil Chemistry Program”

In the TMI-1 LRA, the applicant stated that AMP B.2.1.16 is an existing program that, following enhancement, will be consistent with the GALL Report AMP XI.M30, “Fuel Oil Chemistry,” with exceptions and enhancements.

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

Document Number	Title	Revision/Date
TM-PBD-AMP-B.2.1.16	Program Basis Document - Fuel Oil Chemistry	Rev. 0
SP-1101-38-016	Specification for Diesel Fuel Oil No. 2	Rev. 6

In comparing the elements in the applicant’s AMP to those in the GALL Report AMP XI.M30, the staff found both exceptions and enhancements between the applicants AMP and the GALL Report AMP. The exceptions are as follows:

1. TMI-1 not adopting the Standard Technical Specifications (STS) which include fuel oil purity and testing requirements based on NUREGs 1430 through 1433. The TMI-1 fuel oil specifications and procedures invoke equivalent requirements for fuel oil purity and fuel oil testing as described by the STS. The staff noted that the meaning of “equivalent requirements” is not clear. A direct comparison between the STS and the TMI-1 fuel oil specifications is needed along with a justification for any difference in fuel oil purity and testing parameters. The staff will consider issuing an RAI requesting that the applicant address this issue. A discussion of the issue and the results of the staff’s review of the applicant’s response to the RAI will be provided in the forthcoming SER.
2. Multilevel sampling, tank bottom draining, cleaning and internal inspection of the 7.3 gallon Station Blackout (SBO) Diesel Clean Fuel Tank and the 550 gallon SBO Fuel Day Tank have not been performed and that in lieu of these activities a one-time UT examination will be performed on the bottom of these tanks. It is not clear as to why these activities will not be performed. Also, it is not clear as to the extent of the UT inspection of the tank bottoms. The staff will consider issuing an RAI requesting that the applicant address this issue. A discussion of the issue and the results of the staff’s review of the applicant’s response to the RAI will be provided in the forthcoming SER.

The enhancements are as follows:

- The determination of water and sediment in accordance with ASTM D 1796-97.
- The analysis for particulate contamination in new and stored fuel oil in accordance with modified ASTM D 2276, Method A.
- The analysis for bacteria in new and stored fuel oil.
- The completion of full spectrum fuel oil analysis within 31 days following the addition of new fuel oil into fuel storage tanks.
- The analysis of new oil for specific or API gravity, kinematic viscosity, and water and sediment prior to filling the 50,000 gallon fuel oil storage tank and the Diesel Fire Pump 350 gallon fuel oil storage tanks.

- Sampling of new fuel oil deliveries in accordance with ASTM D 4057-95.
- Multilevel sampling of the Emergency Diesel Generator 30,000 gallon fuel oil storage tank and the SBO Diesel Generator 25,000 gallon fuel oil storage tank in accordance with ASTM D 4057.
- Quarterly sampling for the 550 gallon diesel generator day tanks.
- The use of UT techniques for determining tank bottom thicknesses, should there be any evidence of loss of material due to general, pitting, crevice, and MIC, and fouling found during visual inspection activities.

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

In conclusion, the staff compared 7 of the 10 elements (as discussed in paragraph 4 on page 2 of this report) in the applicant's program and verified that those 7 elements are consistent with those recommended in GALL Report AMP XI.M30, not including any exceptions identified by the applicant in the LRA for this AMP, which will be discussed in the forthcoming SER.

LRA AMP B.2.1.18, One Time Inspection

In the TMI-1 LRA, the applicant stated that AMP B.2.1.18 is a new program that is consistent with the GALL Report AMP XI.M32, "One-Time Inspection," with one exception.

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

Document Number	Title	Revision/Date
TM-PBD-AMP-B.2.1.18	Program Basis Document - One-Time Inspection	Rev. 2
TM-SSBD-OTI	One-Time Inspection Sample Basis Document	Rev. 0
Issue Report 264882	SW Pipe Wall Thickness Downstream of SW-V-5B	10/19/04
Issue Report 392919	Small Bore FAC Component 411-1015-186 Found Thin	11/01/05
Issue Report 083383	MU-V-94 Internal Thermosleeve Visual Indication	11/19/01
Issue Report 182877	Pressurizer Surge Line Weld SR-0010BM Has 2 UT Indications	10/25/03
None	Planner Instructions for Various Plant Maintenance Inspections or Periodic Inspections Performed by Programs such as ASME Section XI	None

In comparing the elements in the applicant's AMP to those in the GALL Report AMP XI.M32, the staff noted an exception between the applicants AMP and the GALL Report AMP which is related to the code version to be used as a basis for one-time inspections that are based on ASME Section XI B&PV Code examination methods and acceptance criteria. The applicant states that they are in their third ten-year ISI interval and that the ISI Program for this interval is based on the 1995 ASME Section XI B&PV Code, including 1996 addenda, and the next 120-month inspection interval will incorporate the requirements specified in the version of the ASME Code endorsed by 10 CFR 50.55a twelve months before the start of the next inspection interval. The applicant identified use of ASME Section XI Code version different from the one referenced in the GALL Report.

In its review of the applicant's on-site documents, the staff noted that the applicant's One-Time Inspection Sample Basis Document (TM-SSBD-OTI) provides detailed guidance with regard to selecting appropriate types and numbers of components for one-time inspection. The staff also noted that the applicant has prepared a set of "planner instructions" that provide guidance for maintenance planners to implement and document the results of inspections to be credited under the applicant's One-Time Inspection program. The planner instructions provide guidance to enable a maintenance planner to appropriately select components to be inspected and to implement appropriate examination/inspection techniques and acceptance criteria based on the potential aging effect being monitored and the systems and components being inspected.

The staff also reviewed the operating experience reports, including a sample of issue reports, and interviewed the applicant's technical staff and confirmed that the plant-specific operating experience did not reveal any degradation not bounded by industry experience

In conclusion, the staff compared 7 of the 10 elements (as discussed in paragraph 4 on page 2 of this report) in the applicant's program and verified that those 7 elements are consistent with those recommended in GALL Report AMP XI.M32, not including any exceptions identified by the applicant in the LRA for this AMP, which will be discussed in the forthcoming SER.

LRA AMP B.2.1.19, “Selective Leaching of Materials Program

In the TMI-1 LRA, the applicant stated that AMP B2.1.19 is a new program that will be consistent with the GALL Report AMP XI.M33, “Selective Leaching of Materials.”

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

Document Number	Title	Revision/Date
TM-PBD-AMP-B.2.1.19	Program Basis Document - Selective Leaching of Materials	Rev. 1
Issue Report 281003	Action Request - Test Cap Failure due to Selective Leaching	02/25/05
TM-SSBD-SLI	Selective Leaching Inspection Sample Basis Document	Rev. 0

In comparing the elements in the applicant’s AMP to those in the GALL Report AMP XI.M33, the staff noted the program elements between the two are consistent.

In Section 4.5, Acceptance Criteria, of TM-SSBD-SLI, it is stated that hardness test readings that are significantly less than unexposed surface hardness readings may be an indication of selective leaching. The applicant indicated that a 25% reduction in hardness reading is considered to be significant. The inspection conducted by Region I staff will include confirmation of the meaning of “significantly less.”

The staff also reviewed the operating experience reports including a sample of issue reports and interviewed the applicant’s technical staff and confirmed that the plant-specific operating experience did not reveal any degradation not bounded by industry experience.

In conclusion, the staff compared 7 of the 10 elements (as discussed in paragraph 4 on page 2 of this report) in the applicant’s program and verified that those 7 elements are consistent with those recommended in GALL Report AMP XI.M33.

LRA AMP B.2.1.20, Buried Piping and Tanks Inspection Program

In the TMI-1 LRA, the applicant stated that LRA AMP B.2.1.20 is consistent with the GALL Report AMP XI.M34, "Buried Piping and Tanks Inspection," with exceptions.

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

Document Number	Title	Revision/Date
TM-PBD-AMP-B.2.1.20	Program Basis Document - Buried Piping and Tanks Inspection	Rev. 2
Issue Report 360706	Action Request - Underground Piping Leak Downstream of FS-V-237	N/A
Issue Report 359262	Action Request - Underground Leak By FS-P-3 Building	N/A
Issue Report 501765	Action Request - Perform Underground Piping Guided Wave and C-Scan Inspection	N/A
Issue Report 495884	Action Request - Perform EACE on CO-T1A De-Icing Line Leak	N/A
Issue Report 434911	Action Request - Leak Discovered Near Heat Exchanger Vault	N/A
Issue Report 519661	Action Request - Long-Term Plan for Underground Piping Program	N/A

In comparing the elements in the applicant's AMP to those in the GALL Report AMP XI.M34, the staff noted exceptions between the applicants AMP and the GALL Report AMP.

The applicant uses an alternate to visual inspection for the outside surface of a diesel fuel oil tank. The applicant stated that the GALL Report, Section XI.M34, "Buried Piping and Tanks Inspection AMP," recommends that opportunistic or focused inspections of the external surfaces of buried components be performed. Internal inspection and UT of the buried Diesel Generator Fuel Storage 30,000 Gallon Tank wall will be used in lieu of inspection of the external surface of this tank. This internal surface visual inspection and UT examination of the tank wall will provide an alternate means to monitor the tank's pressure retaining ability. The Diesel Generator Fuel Storage 30,000 Gallon Tank will be inspected within the ten-year period prior to the period of extended operation, and within ten years of entering the period of extended operation.

The staff noted that UT examination is capable of detecting loss of material. However, it was not clear as to the extent and scope of the examinations. The potential for degradation of a buried tank is uniform over the entire surface of the tank. Measurements of tank thickness representative of the entire tank surface need to be performed to ensure that the tank will continue to perform its intended function. The staff will consider issuing an RAI requesting that the applicant address this issue. A discussion of the issue and the results of the staff's review of the applicant's response to the RAI will be provided in the forthcoming SER.

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

In conclusion, the staff compared 7 of the 10 elements (as discussed in paragraph 4 on page 2 of this report) in the applicant's program and verified that those 7 elements are consistent with those recommended in GALL Report AMP XI.M34, not including any exceptions identified by the applicant in the LRA for this AMP, which will be discussed in the forthcoming SER.

LRA AMP B.2.1.21, External Surface Monitoring Program

In the TMI-1 LRA, the applicant stated that AMP B.2.1.21 is a new program that when implemented will be consistent with the GALL Report AMP XI.M36, "External Surface Monitoring," with exceptions.

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

Document Number	Title	Revision/Date
TM-PBD-AMP-B.2.1.21	Program Basis Document - External Surfaces Monitoring	Rev. 1
ER-AA-2030	Conduct of Plant Engineering Manual, Attachment 4	Rev. 5
Issue Report 279557	Action Request - CW-V-12C Need Coating	12/05/04
Issue Report 455144	Action Request - AHC4B Chiller has Minor Surface Corrosion	02/17/06
Issue Report 343546	Action Request - FS-V-22 Rusty and Requires Painting	06/13/05
Issue Report 748645	Action Request - Corrosion and Possible Leakage Off FS-P-2 Piping	03/11/08
Issue Report 754261	Action Request - Pipe Nipples Corroded on Gage Lines	03/24/08
Issue Report 757614	Action Request - EG-Y-1A Muffler found Rusted Through	04/01/08

In comparing the elements in the applicant's AMP with the GALL Report AMP XI.M36, the staff found an exception between the applicants AMP and the GALL Report AMP which relates to expanding the scope of material and aging effects for the AMP.

The staff also reviewed the operating experience reports, including a sample of issue reports, and interviewed the applicant's technical staff and confirmed that the plant-specific operating experience did not reveal any degradation not bounded by industry experience. The staff's review indicated that the applicant's procedure for system walkdowns has been capable of identifying degradation of plant components and that appropriate corrective actions were taken to correct identified degradation. In the applicant's OpE, the staff identified that the diesel generator muffler had a continuous area that was rusted through and another area with sporadic holes rusted through. The applicant had initiated corrective actions and this muffler will be repaired or replaced during refueling outage 1R18.

In conclusion, the staff compared 7 of the 10 elements (as discussed in paragraph 4 on page 2 of this report) in the applicant's program and verified that those 7 elements are consistent with those recommended in GALL Report AMP XI.M36, in the areas where the applicant claimed consistency with the GALL Report, not including any exceptions identified by the applicant in the LRA for this AMP, which will be discussed in the forthcoming SER.

LRA AMP B.2.1.22, Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components Program

In the TMI-1 LRA, the applicant stated that AMP B.2.1.22 is a new program that when implemented will be consistent with the GALL Report AMP XI.M38, "Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components," with exceptions.

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

Document Number	Title	Revision/Date
TM-PBD-AMP-B.2.1.22	Program Basis Document – Inspection of Internal Surfaces of Miscellaneous Piping and Ducting Components	Rev. 2
Issue Report 140397	Action Request - Reactor Building Cooler Internal Inspection	01/21/03
Issue Report 371921	Action Request - Aux. Boiler Blowdown Tank Drain to Sump Line Leak	08/29/05
Issue Report 214955	Action Request - CO-T-1A Internal Inspection Findings	04/14/04
1410-P-7	Corrective Maintenance Procedure – Centrifugal Pumps	Rev. 16
1410-T-1	Corrective Maintenance Procedure – Tank Inspection	Rev. 16
1410-V-8	Corrective Maintenance Procedure – Ball, Plug and Cage Type Control Valve Maintenance	Rev. 16

In comparing the elements in the applicant's AMP with the GALL Report AMP XI.M38, the staff found exceptions between the applicants AMP and the GALL Report AMP which include: an increase of the component material types within the scope of the AMP; an increase of the aging effects within the scope of the AMP; the use of volumetric testing to detect stress corrosion cracking of stainless steel components; and the use of physical manipulation to detect hardening and loss of strength of elastomers both internally and externally.

The staff noted that for the "detection of aging effects" program element, the GALL Report recommends that the inspection techniques be identified and justified for the aging effects of concern. However, upon review of TMI-1 PBD TM-PBD-AMP-B.2.1.22, the staff felt that additional information in this area is needed. The staff will consider issuing an RAI requesting that the applicant address this issue. A discussion of the issue and the results of the staff's review of the applicant's response to the RAI will be provided in the forthcoming SER.

The staff also reviewed the operating experience reports, including a sample of issue reports, and interviewed the applicant's technical staff and confirmed that the plant-specific operating experience did not reveal any degradation not bounded by industry experience. The staff noted that boron deposits were noted on the fans and coolers of the Reactor Building Fans and

Coolers. The staff further noted that the boron deposits were cleaned and the reactor coolant leak that caused the deposits was corrected. However the staff felt that additional information was needed, in terms of subsequent inspections. The staff will consider issuing an RAI requesting that the applicant address this issue. A discussion of the issue and the results of the staff's review of the applicant's response to the RAI will be provided in the forthcoming SER.

In conclusion, the staff compared 7 of the 10 elements (as discussed in paragraph 4 on page 2 of this report) in the applicant's program and verified that those 7 elements are consistent with those recommended in GALL Report AMP XI.M38, not including any exceptions identified by the applicant in the LRA for this AMP, and the areas in which the staff felt additional clarification might be warranted as described above, which will be discussed in the forthcoming SER.

LRA AMP B.2.1.23, Lubricating Oil Analysis Program

In the TMI-1 LRA, the applicant stated that AMP B.2.1.23 is an existing program that is consistent with the GALL Report AMP XI.M39, "Lubricating Oil Analysis Program," with one exception.

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

Document Number	Title	Revision/Date
TM-PBD-AMP-B.2.1.23	Program Basis Document - Lubricating Oil Analysis	Rev. 1
MA-AA-716-230	Predictive Maintenance Program	Rev. 3
MA-AA-716-230-1001	Oil Analysis Interpretation Guideline	Rev. 5
MA-TM-716-230-1004	Guideline for Implementation and Management of the TMI Lubrication Program	Rev. 0
Work Order R18000136	Crankcase Lube Oil Sample	N/A

In comparing the elements in the applicant's AMP with the Gall Report AMP XI.M39, the staff found an exception between the applicants AMP and the GALL Report AMP which is that the flash point will only be monitored for lubricating oil where there is a potential for dilution with volatile liquids such as diesel fuel and new oil for quality control purposes. The applicant claims that monitoring of the flashpoint in lubricating oil, where there is no potential of contamination with flammable liquids is not necessary because flashpoint is not an indicator of water or particulate contamination. The staff will provide a discussion of the issue in the forthcoming SER.

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

In conclusion, the staff compared 7 of the 10 elements (as discussed in paragraph 4 on page 2 of this report) in the applicant's program and verified that those 7 elements are consistent with those recommended in GALL Report AMP XI.M39, not including any exceptions identified by the applicant in the LRA for this AMP, which will be discussed in the forthcoming SER.

LRA AMP B.2.1.24, ASME Section XI, Subsection IWE

In the TMI-1 LRA, the applicant stated that AMP B.2.1.24 is an existing program that is consistent with the GALL Report AMP XI.S1, “ASME Section XI, Subsection IWE,” with one exception.

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

Document Number	Title	Revision/Date
TM-PBD-AMP-B.2.1.24	Program Basis Document - ASME Section XI, Subsection IWE	Rev. 1
CAP No. T1999-0918	The moisture barrier that creates a water tight seal from the containment liner plate to the 281’ el. Floor slab is degraded	09/29/99
Issue Report 185821	Subject: RB Liner – Evidence of Corrosion @ Elev 281’	11/05/03
Issue Report 390199	Subject: Found Lack of Bond on the RB Moisture Barrier	10/25/05
Data Sheet No. 99-071	RB IWE Containment Inspection for 13R	09/17/99
Calc No. DC-536910-00014-01-SE	RB Liner Corrosion	Rev. 0
ECR TM 03-00921	Evaluation of RB Liner Corrosion Found During T1R15	Rev. 0

In comparing the elements in the applicant’s AMP to those in the GALL Report AMP XI.S1, the staff found one exception between the applicants AMP and the GALL Report AMP which is due to the use of a particular edition of the ASME Section XI B&PV code. The GALL Report recommends the 2001 edition including the 2002 and 2003 Addenda. The TMI-1 ASME Section XI, Subsection IWE program plan for the current 10-year inspection interval (2001 through 2011) is based on ASME Section XI, 1992 Edition including 1992 addenda, which is acceptable per 10 CFR 50.55a. The applicant stated the next 10-year inspection interval will adopt the new ASME Code editions and addenda available 12 months prior to the start of inspection interval, consistent with the provisions of 10 CFR 50.55a. Since the applicant did not specify which program elements took exceptions to the GALL Report AMP elements, the staff will consider issuing an RAI requesting that the applicant address this issue. A discussion of the issue and the results of the staff’s review of the applicant’s response to the RAI will be provided in the forthcoming SER.

The staff also reviewed the operating experience reports, including a sample of issue reports, and interviewed the applicant’s technical staff and confirmed that the plant-specific operating experience did not reveal any degradation not bounded by industry experience. The review indicated that the liner thickness corrosion rate was noticeable from the TMI-1 Operating Experience. Therefore, the staff identified an issue where additional clarification is needed to complete the review which is restoration (weld repair) to nominal plate thickness at all locations

identified as below 90% before entering the extended operation period. The staff had conducted a break-out meeting with applicant personnel to address these two concerns. The staff will consider issuing an RAI requesting that the applicant address this issue. A discussion of the issue and the results of the staff's review of the applicant's response to the RAI will be provided in the forthcoming SER.

In conclusion, the staff compared 7 of the 10 elements (as discussed in paragraph 4 on page 2 of this report) in the applicant's program and verified that those 7 elements are consistent with those recommended in GALL Report AMP XI.S1, not including any exceptions identified by the applicant in the LRA for this AMP, and the areas in which the staff felt additional clarification might be warranted as described above, which will be discussed in the forthcoming SER.

LRA AMP B.2.1.25, ASME Section XI, Subsection IWL

In the TMI-1 LRA, the applicant stated that TMI-1 AMP B.2.1.25 is an existing program that is consistent with the GALL Report AMP XI.S2, "ASME Section XI, Subsection IWL."

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

Document Number	Title	Revision/Date
TM-PBD-AMP-B.2.1.25	Program Basis Document - ASME Section XI, Subsection IWL	Rev. 1
Topical Report No. 183	30 th Year Reactor Building Tendon Surveillance (Period 8)	Rev. 0
Topical Report No. 136	25 th Year Reactor Building Tendon Surveillance (Period 7)	Rev. 1
CAP T2000-0445	RB Vertical Tendon Grease Can Spill	05/28/00
CAP T2000-0506	Dome Tendon D104NW Grease	06/21/00
Issue Report 318770	RB Surface condition during tendon Inspection	03/08/05

In comparing the elements in the applicant's AMP to those in the GALL Report AMP XI.S2, the staff verified that the program elements between the two are consistent.

The staff also reviewed the operating experience reports, including a sample of issue reports, and interviewed the applicant's technical staff and confirmed that the plant-specific operating experience did not reveal any degradation not bounded by industry experience. The applicant performed its most recent 30th and 25th containment structure IWL inspection in 2005 and 2000. The applicant's inspection results confirmed the physical condition of the concrete for containment structures was satisfactory. However, in the applicant's LRA, the plots or data tables for the historically inspected tendon forces, the predicted force, the tendon group trend line, and the minimum required prestressing force or value (MRV) were not fully presented. The staff conducted a break-out meeting with the applicant to address this concern. The staff will consider issuing an RAI requesting that the applicant address this issue. A discussion of the issue and the results of the staff's review of the applicant's response to the RAI will be provided in the forthcoming SER.

In conclusion, the staff compared 7 of the 10 elements (as discussed in paragraph 4 on page 2 of this report) in the applicant's program and verified that those 7 elements are consistent with those recommended in GALL Report AMP XI.S1, except for the areas in which the staff felt additional clarification might be warranted as described above.

LRA AMP B.2.1.26, ASME Section XI, Subsection IWF

In the TMI-1 LRA, the applicant stated that TMI-1 AMP B.2.1.26 is an existing program that is consistent with the GALL Report AMP XI.S3, "ASME Section XI, Subsection IWF," with one exception.

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

Document Number	Title	Revision/Date
TM-PBD-AMP-B.2.1.26	Program Basis Document - ASME Section XI, Subsection IWF	Rev. 0
NRC Docket # 50-289	AmerGen Letter to NCR, Cycle 16 Refueling (T1R16) Inservice Inspection (ISI) Summary Report	02/15/06
Issue Report A2073464	Unsatisfactory ISI Rigid Restraint MUH0041	11/07/03
Issue Report A00351330	ISI FASA Recommendations / Enhancements	07/07/05

In comparing the elements in the applicant's AMP to those in GALL AMP XI.S3, the staff found one exception between the applicants AMP and the GALL Report AMP which is due to the use of specific edition of the ASME Section XI B&PV code. The GALL Report recommends the 2001 edition including the 2002 and 2003 Addenda. The TMI-1 ASME Section XI, Subsection IWF program plan for the current 10-year inspection interval is based on ASME Section XI, 1995 Edition including 1996 addenda, which is acceptable per 10 CFR 50.55a. The applicant stated the next 10-year inspection interval will adopt the new ASME Code editions and addenda available 12 months prior to the start of inspection interval, consistent with the provisions of 10 CFR 50.55a. Since the applicant did not specify which program elements took exceptions against GALL AMP elements due to the use of ASME Section XI edition, the staff will consider issuing an RAI requesting that the applicant address this issue. A discussion of the issue and the results of the staff's review of the applicant's response to the RAI will be provided in the forthcoming SER.

The staff also reviewed the operating experience reports, including a sample of issue reports, and interviewed the applicant's technical staff and confirmed that the plant-specific operating experience did not reveal any degradation not bounded by industry experience. Operating experience is used in two ways at TMI-1 to enhance plant programs, prevent repeat events, and prevent events that have occurred at other plants from occurring at TMI-1. The first way is through the TMI-1 Operating Experience process which screens, evaluates, and acts on operating experience documents and information to prevent or mitigate the consequences of similar events. The second way is through the process for managing programs, which requires the review of program related operating experience by the program owner. The operating experience of the ASME Section XI, Subsection IWF program provided by applicant did not show any adverse trend in performance. The applicant confirmed that problems identified would not cause significant impact to the safe operation of the plant, and adequate corrective actions were taken to prevent recurrence.

In conclusion, the staff compared 7 of the 10 elements (as discussed in paragraph 4 on page 2 of this report) in the applicant's program and verified that those 7 elements are consistent with those recommended in GALL Report AMP XI.S3, not including any exceptions identified by the applicant in the LRA for this AMP, which will be discussed in the forthcoming SER.

LRA AMP B.2.1.27, 10 CFR Part 50, Appendix J

In the TMI-1 LRA, the applicant stated that TMI-1 AMP B.2.1.27 is an existing program that is consistent with GALL AMP XI.S4, “10 CFR Part 50, Appendix J.”

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

Document Number	Title	Revision/Date
TM-PBD-AMP-B.2.1.27	Program Basis Document - 10 CFR Part 50, Appendix J	Rev. 1
NOSA-TMI-06-07	Three Mile Island Station Surveillance and Test Program Audit	10/2-13/06
Issue Report 187831	Subject: Cont. Isol. Valve leakage exceeded individual admin limits	11/22/03
Issue Report 154010	Subject: Equipment hatch LLRT shows increasing leakage	04/14/03
Issue Report 100552	Subject: Cont. Isol. Valve leakage exceeded individual admin limits	11/06/01
ER-AA-380	Primary Containment Leakage Testing Program	Rev. 4

In comparing the elements in the applicant’s AMP to those in the GALL Report AMP XI.S4, the staff found that the program elements between the two are consistent. TMI-1 chose Option B of Appendix J, the performance based approach, for meeting the GALL Report’s “Operating Experience” element. However, the staff identified two issues where additional clarifications were needed to complete the review. The first issue noted by the staff was maximum allowable leakage rate at pressure Pa as specified in the Technical Specifications, La (percent/24 hours), should be used per 10 CFR 50, Appendix J local leak-rate test (LRT). However, in the Operating Experience of the applicant’s 10 CFR 50, Appendix J Program, results were not in terms of La, but Standard Cubic Centimeters per minute. The second issue was that there are no results for Type A test (integrated LRT) in the LRA. The staff had conducted a break-out meeting with applicant personnel to address these two issues. The staff will consider issuing RAIs requesting that the applicant address these issues. A discussion of the issues and the results of the staff’s review of the applicant’s responses to the RAIs will be provided in the forthcoming SER.

The staff also reviewed the operating experience reports, including a sample of issue reports, and interviewed the applicant’s technical staff and confirmed that the plant-specific operating experience did not reveal any degradation not bounded by industry experience. The review indicated a positive trend in performance on overall leakage; except that individual valves on occasion exceed the leakage acceptance test values and repairs are made in accordance with the program. Based on the discussions with applicant’s technical staff and review of the basis documents, the staff found the sum of the leakage rates at accident pressure of Type B tests, and pathway leakage rates from Type C tests were well below the leakage performance criterion with margin (0.6 La), as specified in the Technical Specification.

In conclusion, the staff compared 7 of the 10 elements (as discussed in paragraph 4 on page 2 of this report) in the applicant's program and verified that those 7 elements are consistent with those recommended in GALL Report AMP XI.S4, except for the areas in which the staff felt additional clarification might be warranted as described above which will be discussed in the forthcoming SER.

LRA AMP B.2.1.28. Structures Monitoring Program

In the TMI LRA, the applicant stated that TMI AMP B.2.1.28 is an existing program that is consistent with GALL AMP XI.S6, “Structures Monitoring Program,” with enhancements.

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

Document Number	Title	Revision/Date
TM-PDB-AMP-B.2.1.28	Program Basis Document - Structures Monitoring Program	Rev. 1
ER-AA-310	Implementation of the Maintenance Rule	Rev. 6
ER-AA-310-1004	MR – Performance Monitoring	Rev. 5
Report 990-2499	Structures Baseline Inspection Report Reactor building	Rev. 0

In comparing the elements in the applicant’s AMP to those in the GALL Report AMP XI.S6, the staff noted that the program elements between the two are consistent with enhancements. The TMI-1 Structures Monitoring Program (SMP) was developed and implemented to meet the regulatory requirements of 10 CFR 50.65. The program is including the requirements for Masonry Wall Program (MWP) and RG 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants. In the SMP, structural components and commodities of the MWP and RG 1.127 structures are monitored for age-related deterioration, degradation due to extreme environmental conditions, and the effects of natural phenomena that may affect its intended function of the SMP.

During the review, the staff noted that the applicant does not include the frequency of periodic sampling of ground water for pH, chloride, and sulfate concentration, the staff will consider issuing a 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 will provide a discussion of this issue in the forthcoming SER.

The staff found that the applicant has taken enhancements as follows:

1. Added a program requirement in the “Scope of Program” element to include the following structures and commodities: Service Building; UPS Diesel Building; Intake Canal; Mechanical Draft Cooling Tower Structures; Miscellaneous Yard Structures (Foundation for condensate storage tank, borated water storage tank, diesel fuel storage tank, altitude tank, duct banks, and manholes); Inspection of submerged reinforced concrete for Intake Screen house and Pumphouse, Circulating Water Pump House, Mechanical Draft Cooling Tower Structures, Natural Draft Tower Basins; Penetration Seals; Cabinets, and Enclosures for Electrical Equipment and Components; HVAC duct supports for loss of material.
2. Added program requirements in the “Parameters Monitored or Inspected” element to include the following: Include reinforced concrete plausible aging mechanisms; Concrete structures will also be observed for a reduction in anchor capacity due to local concrete degradation. The program will be enhanced to

clarify that inspection be performed for loss of material due to corrosion (general, crevice, pitting) for steel components, such as embedment, panels and enclosures, doors, siding, metal deck, structural bolting, and anchors; inspection of penetration seals and structural seals, ground water sampling, monitoring of vibration isolators, associated with component supports other than those covered by ASME XI, Subsection IWF; Intake Canal will be monitored for loss of material, loss of form/erosion, settlement, sedimentation, waves and currents.

3. Added program requirements in the "Detection of Aging Effects" element to require inspection of submerged structures in raw water on a frequency of 5 years. Inspection will be performed by a diver or by using remote video or other special safety equipment.
4. The applicant also included an enhancement in the "Acceptance Criteria" element implementing procedures will be enhanced to detailed acceptance criteria specified in ACI 349.3R-96, Chapter 5.

Implementing procedures will be enhanced to require that loss of material and loss of form for the intake canal be evaluated to ensure the required volume of emergency cooling water is in accordance with the updated FSAR Section 2.6.

The staff reviewed the operating experience reports, including a sample of issue reports, and interviewed the applicant's technical staff and confirmed that the plant-specific operating experience did not reveal any degradation not bounded by industry experience. However, the staff noticed that, under the LRA for this element, the applicant stated that: "Silt accumulation was observed at the discharge of the 48-inch diameter emergency river water dump line. The silt covered approximately half the diameter of the pipe outlet, a condition also observed in 1999, during the baseline inspections. Engineering evaluation concluded that the discharge line remains capable of performing its intended function." The staff will consider issuing an RAI requesting that the applicant address this issue. A discussion of the issue and the results of the staff's review of the applicant's response to the RAI will be provided in the forthcoming SER.

The staff also conducted a field walk-down with the applicant's technical staff to verify conditions of the intake canal, flood dike, riprap, turbine building airshaft, mechanical draft cooling tower, and Unit 2 fuel handling building.

The staff was unable to perform a walk-down to verify the ground water intrusion in the Air Intake Tunnel (the in-leakage during the wet weather was estimated at 1 – 2 gpm and has degraded expansion joints) due to safety issues concerning confined space. However, the staff reviewed documentation, including photographs of the tunnel which included locations of the water leakage; degradation (rust) on conduits, cable boxes, and conduit supports; degradation of paint on the fire protection piping; and damaged expansion joint material. The applicant indicated that maintenance work orders had been issued to correct these deficiencies, however, the staff was unable to verify this, and referred the issue to Region I staff for follow up during their subsequent license renewal inspection scheduled for November/December 2008.

In conclusion, the staff compared 7 of the 10 elements (as discussed in paragraph 4 on page 2 of this report) in the applicant's program and verified that those 7 elements are consistent with those recommended in GALL Report AMP XI.S6, except for the areas in which the staff felt additional clarification might be warranted as described above which will be discussed in the forthcoming SER.

LRA AMP B.2.1.29. Protective Coating Monitoring and Maintenance Program

In the TMI-1 LRA, the applicant stated that TMI AMP B.2.1.29 is an existing program that is consistent with GALL AMP XI.S8, “Protective Coating Monitoring and Maintenance Program.”

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

Document Number	Title	Revision/Date
TM-PDB-AMP-B.2.1.29	Program Basis Document - Protective Coating Monitoring and Maintenance Program	Rev. 0
ER-AA-310-008	Exelon Service Level I, and Safety-Related (Service Level III) Protected Coating	Rev. 5
CC-AA-205	Control of Undocumented/Unqualified Coatings Inside the Containment	Rev. 4
EP-055T	Monitoring and Tracking of Coatings in Containment	Rev. 1
1440-Y-2	Qualifications and Certification of TMI-1 Painting	Rev. 6
SP-1101-58-009	Qualification testing of Coating Systems for Service Level 1 Application	Rev. 0

In comparing the elements in the applicant’s AMP to those in the GALL Report AMP XI.S8, the staff found that the program elements between the two are consistent. The staff noted that Service Level 1 protecting coatings are maintained and inspected inside the containment for blistering, chalking, checking, chipping, cracking, discoloration, flaking, peeling, rusting, etc. Failure of coatings could also result in the failure of safety systems to perform their intended functions, e.g., containment sump.

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

In conclusion, the staff compared 7 of the 10 elements (as discussed in paragraph 4 on page 2 of this report) in the applicant’s program and verified that those 7 elements are consistent with those recommended in GALL Report AMP XI.S8.

LRA AMP B.2.1.30, Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements

In the TMI-1 LRA, the applicant stated that AMP B.2.1.30 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 reviewed the applicant's on-site documentation supporting the applicant's conclusion that their AMP elements are consistent with the elements in the GALL AMP. The staff interviewed the applicant's technical staff and reviewed the following documents.

Document Number	Title	Revision/Date
TM-PBD-AMP-B.2.1.30	Program Basis Document - Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental	Rev. 1
Issue Report 110661	Action Request - Found Degraded Cables in High Voltage Cabinet"	06/05/02
EPRI TR-109619	"Guideline for the Management of Adverse Localized Environments"	06/99
SAND96-0344	"Aging Management Guideline for Commercial Nuclear Power Plants – Electrical Cables and Terminations"	09/96
EPRI TR-1013475	"License Renewal Electrical Handbook"	02/07
IEEE Standard 1205-2000	"IEEE guide for Assessing, Monitoring, and Mitigating Effects on Class 1E Equipment Used in Nuclear Power Generating Stations"	
NUREG/CR-5643	"Insights Gained From Aging Research, U.S. Nuclear Regulatory Commission"	03/92

In comparing the elements in the applicant's AMP to those in the GALL Report AMP XI.E1, the staff found that the program elements between the two are consistent. The staff determined that the applicant did not provide an adequate definition for "adverse localized environment," which should be based on the most limiting design by cable type. The staff will consider issuing an RAI requesting that the applicant address this issue. A discussion of the issue and the results of the staff's review of the applicant's response to the RAI will be provided in the forthcoming SER.

The staff also reviewed the operating experience reports including a sample of issue reports, and interviewed the applicant's technical staff and confirmed that the plant-specific operating experience did not reveal any degradation not bounded by industry experience. In 2002, the insulation on the electrical cable connecting security light I-113 to the local junction box was degraded inside both the junction box and the light fixture. The insulation on the individual conductors was brittle and cracked with exposed bare wires present. The staff noted that proper corrective actions were taken to address the issue.

In conclusion, the staff compared 7 of the 10 elements (as discussed in paragraph 4 on page 2 of this report) in the applicant's program and verified that those 7 elements are consistent with those recommended in GALL Report AMP XI.E1, except for the areas in which the staff felt

additional clarification might be warranted as described above which will be discussed in the forthcoming SER.

LRA AMP B.2.1.31, Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Used in Instrumentation Circuits

In the TMI-1 LRA, the applicant stated that AMP B.2.1.31 is an existing program that is consistent with the GALL Report AMP XI.E2, “Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Used in Instrumentation Circuits,” with an enhancement.

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

Document Number	Title	Revision/Date
TM-PBD-AMP-B.2.1.31	Program Basis Document - Electrical Cables and Connections Not Subject to 10 CFR 50.49 EQ Requirements	Rev. 0
Issue Report 361099	NI-12 WR and SR Signal Degraded	08/08/05
Issue Report 364537	NI-12 WR and SR Signal Significantly Degraded	08/18/05
A2120903	“Replace Electrical Penetration 201E (NI-12)”	03/20/06
NRC IN 97-45	“Environmental Qualification Deficiency for cables and Containment Penetration Pigtails”	07/02/97
EPRI TR-109619	“Guideline for the Management of Adverse Localized Environments”	06/99
SAND96-0344	“Aging Management Guideline for Commercial Nuclear Power Plants – Electrical Cables and Terminations”	09/96
EPRI TR-1013475	“License Renewal Electrical Handbook”	02/07
IEEE Standard 1205-2000	“IEEE guide for Assessing, Monitoring, and Mitigating Effects on Class 1E Equipment Used in Nuclear Power Generating Stations”	
NUREG/CR-5643	“Insights Gained From Aging Research, U.S. Nuclear Regulatory Commission”	03/92

In comparing the elements in the applicant’s AMP to those in the GALL Report AMP XI.E2, the staff found that the program elements are consistent between the applicants AMP and the GALL Report AMP with an enhancement which is to perform direct cable testing for in scope nuclear instrumentation circuits. The staff noted the incore monitoring system is not in scope of the LRA, therefore, the staff will consider issuing an RAI requesting that the applicant address this issue. A discussion of the issue and the results of the staff’s review of the applicant’s response to the RAI will be provided in the forthcoming SER.

The staff also reviewed the operating experience reports including a sample of issue reports, and interviewed the applicant’s technical staff and confirmed that the plant-specific operating experience did not reveal any degradation not bounded by industry experience. In 2005, during system performance monitoring of the RG 1.97 neutron monitors (NI-11 and NI-12), the PPC point A1052 for NI-12 Wide Range indication had degraded from approximately 116% to 95%. Corrective action was taken to address the issue.

In conclusion, the staff compared 7 of the 10 elements (as discussed in paragraph 4 on page 2 of this report) in the applicant's program and verified that those 7 elements are consistent with those recommended in GALL Report AMP XI.E2, except for the areas in which the staff felt additional clarification might be warranted as described above which will be discussed in the forthcoming SER.

LRA AMP B.2.1.32, Inaccessible Medium Voltage Cables Not Subject to 10 CFR 50.49 Environmental Qualification Requirements

In the TMI-1 LRA, the applicant stated that AMP B.2.1.32 is a new program that is consistent with the GALL Report AMP XI.E3, “Inaccessible Medium Voltage Cables Not Subject to 10 CFR 50.49 Environmental Qualification Requirements.”

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

Document Number	Title	Revision/Date
TM-PBD-AMP-B.2.1.32	Program Basis Document - Inaccessible Medium Voltage Cables Not Subject to 10 CFR 50.49 Environmental	Rev. 1
Issue Report 310344	Potential Water Infiltration Into Vaults	03/09/05
Issue Report 707134	Water Routinely Collects In Underground Cable Vaults	12/04/07
EPRI TR-109619	“Guideline for the Management of Adverse Localized Environments”	06/99
SAND96-0344	“Aging Management Guideline for Commercial Nuclear Power Plants – Electrical Cables and Terminations”	09/96
EPRI TR-1013475	“License Renewal Electrical Handbook”	02/07
IEEE Standard 1205-2000	“IEEE guide for Assessing, Monitoring, and Mitigating Effects on Class 1E Equipment Used in Nuclear Power Generating Stations”	
NUREG/CR-5643	“Insights Gained From Aging Research, U.S. Nuclear Regulatory Commission”	03/92

In comparing the elements in the applicant’s program to those in the GALL Report AMP XI.E3, the staff found that the program elements between the two are consistent. The staff noted that TMI-1 has operating experience with water in cable vaults and while onsite, the staff observed electrical cables submerged under water in one of three manholes which were inspected and pumped dry two weeks earlier. Therefore, the staff will consider issuing an RAI requesting that the applicant address this issue. A discussion of the issue and the results of the staff’s review of the applicant’s response to the RAI will be provided in the forthcoming SER.

The staff also reviewed the operating experience reports including a sample of issue reports, and interviewed the applicant’s technical staff and confirmed that the plant-specific operating experience did not reveal any degradation not bounded by industry experience. In reviewing operating experience for TMI-1, staff observed recurring problems in select manholes. While the applicant has addressed this to a certain extent, the issue has not been resolved. Therefore, the staff will consider issuing an RAI requesting that the applicant address this issue. A discussion of the issue and the results of the staff’s review of the applicant’s response to the RAI will be provided in the forthcoming SER.

In conclusion, the staff compared 7 of the 10 elements (as discussed in paragraph 4 on page 2 of this report) in the applicant's program and verified that those 7 elements are consistent with those recommended in GALL Report AMP XI.E3, except for the areas in which the staff felt additional clarification might be warranted as described above which will be discussed in the forthcoming SER.

LRA AMP B.2.1.33, Metal Enclosed Bus

In the TMI-1 LRA, the applicant stated that AMP B.2.1.33 is an existing program that is consistent with the GALL Report AMP XI.E4, "Metal Enclosed Bus," with enhancements.

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

Document Number	Title	Revision/Date
TM-PBD-AMP-B.2.1.33	Program Basis Document - Metal Enclosed Bus	Rev. 1
NUREG-1801	Generic Aging Lessons Learned (GALL) Report, Section XI.E4	Rev. 1
Exelon Procedure, MA-AA-716-230-1003	Thermography Program Guide	Rev. 1
Exelon PCM	Template for Metal Enclosed Bus	01/22/2007

In comparing the elements in the applicant's AMP to those in the GALL Report AMP XI.E4, the staff found that the program elements between the applicants AMP and the GALL Report AMP are consistent with enhancements to the inspection activities. The staff also verified that the applicant provided an adequate summary description of the program.

The staff walked down the 6.9 kV and 4.16 kV metal enclosed buses inside the turbine building. The staff also discussed the preventive maintenance (PM) activities including thermography technique used in TMI-1 with the plant personnel responsible for maintaining the metal enclosed buses.

The staff reviewed the operating experience reports, including a sample of issue reports, and interviewed the applicant's technical staff and confirmed that the plant-specific operating experience did not reveal any degradation not bounded by industry experience. In AMP B.2.1.33, the applicant stated that a specific review of the thermography results from PM repetitive tasks and 1A Auxiliary Transformer bus duct internal inspections did not identify a trend related to aging degradation. Water intrusion into exposed outdoor Metal Enclosed Buses (MEB) has been an industry wide issue. On July 25, 1992 and September 18, 1993, 6.9kV ground faults occurred at TMI- 1. As a result of these events, TMI-1 installed a modification to install rain covers over the 6.9 kV MEB and bushing boxes. A specific review of thermography results from PM repetitive task R2078683 and 1A auxiliary transformer bus duct internal inspection showed no anomalies with MEB over the last five years. In 1993, hot spots were identified during thermography that required an engineering review (engineering evaluation report Number 142709. The engineering review concluded that the heat generation was minimal and the voltage drop for any of the joints was insignificant.

In conclusion, the staff compared 7 of the 10 elements (as discussed in paragraph 4 on page 2 of this report) in the applicant's program and verified that those 7 elements are consistent with those recommended in GALL Report AMP XI.E4.

LRA AMP B.3.1.1, Metal Fatigue of Reactor Coolant Pressure Boundary

In the TMI-1 LRA, the applicant stated that AMP B.3.1.1 is an existing program that is consistent with the GALL Report AMP X.M1, "Metal Fatigue of Reactor Coolant Pressure Boundary."

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

Document Number	Title	Revision/date
TM-PBD-AMP-B.3.1.1	Metal Fatigue of Reactor Coolant Pressure Boundary Program (Unit 1)	Rev. 1
ER-AA-470	Fatigue and Transient Monitoring Program	Rev. 2
TMI-05Q-301	Environmentally Assisted Fatigue (EAF) Analysis for the Three Mile Island Nuclear Plant, Unit 1 (TMI-1)	11/30/07
TMI-05Q-302	60-year Cycle Projections for TMI-1	Rev. 2
51-9045457-001	TMI-1 Surge Line Transients Revised Design Cycles	Rev. 001

In comparing the elements in the applicant's AMP to those in the GALL Report AMP X.M1, the staff verified that the program elements between the two are consistent. During the audit, the staff confirmed that TMI-1 has addressed the environmental effects of the reactor coolant on fatigue usage for the sample components identified in NUREG/CR-6260, using guidelines and formulas contained in NUREG/CR-6583 (for carbon and low-alloy steel components) and NUREG/CR-5704 (for austenitic stainless steel components). The time-limited aging analysis (TLAA) fatigue evaluation results, which have included environmental effects, show that the cumulative fatigue usage factor is less than 1.0, the limit, for all components included in the AMP. This indicates that the environmental fatigue analyses will remain valid throughout the period of extended operation.

The staff reviewed the operating experience reports, including a sample of issue reports, and interviewed the applicant's technical staff and confirmed that the plant-specific operating experience did not reveal any degradation not bounded by industry experience.

In conclusion, the staff compared 7 of the 10 elements (as discussed in paragraph 4 on page 2 of this report) in the applicant's program and verified that those 7 elements are consistent with those recommended in GALL Report AMP X.M1.

LRA AMP B.3.1.2, Concrete Containment Tendon Prestress

In the TMI-1 LRA, the applicant stated that TMI-1 AMP B.3.1.2 is an existing program that is consistent with TLAA Evaluation of AMPs under 10 CFR 54.21(c)(1)(iii), GALL AMP X.S1, "Concrete Containment Tendon Prestress," with exception.

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

Document Number	Title	Revision/Date
TM-PBD-AMP-B.3.1.2	Program Basis Document - Concrete Containment Tendon Prestress	Rev. 0
Topical Report No. 183	30 th Year Reactor Building Tendon Surveillance (Period 8)	Rev. 0
Topical Report No. 136	25 th Year Reactor Building Tendon Surveillance (Period 7)	Rev. 1
Calculation DC-5390-225-02-SE	Three Mile Island #1 Surveillance Tendon Selection	Rev. 0
Calculation C-1101-153-E410-028 (Verification Summary)	RX Building Tendons, Minimum Required Prestressing Force (Verification Summary)	Rev. 0
Calculation C-1101-153-E410-028	RX Building Tendons, Minimum Required Prestressing Force	Rev. 0
TMI Technical Evaluation A21844541-01	TMI Unit 1 Technical Evaluation of RB Containment Post-Tensioned Forced Prediction Until New Extended Life	02/19/08

In comparing the elements in the applicant's program to those in the GALL Report TLAA AMP X.S1, the staff found an exception due to the use of actual design basis instead of the prescribed lower limit for the GALL Report element "Acceptance Criteria." Therefore, the staff agrees with the applicant that the TMI-1 acceptance criteria is more conservative than the GALL Report acceptance criteria.

The staff also reviewed the operating experience reports, a sample of issue reports, calculation sheets, and interviewed the applicant's technical staff and confirmed that the plant-specific operating experience did not reveal any degradation not bounded by industry experience. The applicant performed its most recent tendon force measurements of 2% sample of the total tendons population in 1999 and 2000. However, in the LRA, the plots or data tables for the historically inspected tendon forces, the predicted force, the tendon group trend line, and the MRV were not fully presented. The staff conducted a break-out meeting with applicant to address this issue. The staff will consider issuing an RAI requesting that the applicant address this issue. A discussion of the issue and the results of the staff's review of the applicant's response to the RAI will be provided in the forthcoming SER.

In conclusion, the staff compared 7 of the 10 elements (as discussed in paragraph 4 on page 2 of this report) in the applicant's program and verified that those 7 elements are consistent with those recommended in GALL Report AMP X.S1, not including any exceptions identified by the applicant in the LRA for this AMP, and the areas in which the staff felt additional clarification might be warranted as described above, which will be discussed in the forthcoming SER.

LRA AMP B.3.1.3, Environmental Qualification of Electric Components Program

In the TMI-1 LRA, the applicant stated that AMP B.3.1.3 is an existing program that is consistent with the GALL Report AMP X.E1, "Environmental Qualification of Electric Components."

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

Document Number	Title	Revision/Date
TM-PBD-AMP-B.1.3	Program Basis Document - Environmental Qualification (EQ) of Electrical Components	Rev. 0
NUREG-0588	Interim Staff Position on Environmental Qualification of Safety-Related Electrical Equipment	Rev. 1
NUREG-1801	Generic Aging Lessons Learned (GALL) Report Section X.E1	Rev. 1
Regulatory Guide 1.89	Environmental Qualification of Certain Electric Equipment Important to Safety for Nuclear Power Plants	Rev. 1
TMI-UFSAR Appendix 6B	Environmental Qualification – P/T Parameters	
ES-010T	TMI-1 Environmental Parameters	Rev. 6
CC-MA-203-1001	Environment Qualification Engineering	Rev. 2
MA-MA-716-009	Preventive Maintenance (PM) Work Order Process	Rev. 4
PIMS AR A2037848	EQ Program Engineering Change Requests	07/21/08

In comparing the elements in the applicant's AMP to those in the GALL Report AMP X.E1, staff found that the program elements between the two are consistent. The staff also verified that the applicant provided an adequate summary description of the program.

The staff also reviewed the operating experience reports, including a sample of condition reports, and interviewed the applicant's technical staff and confirmed that the plant-specific operating experience did not reveal any degradation not bounded by industry experience. On September 15, 2005, and March 13, 2006, the applicant observed elevated building area temperatures due to an increase in outside ambient temperatures and equipment failures. The applicant performed an evaluation of these conditions through the corrective action program and demonstrated that the TMI-1 Environmental Qualification (EQ) of Electric Components program ensured that EQ profiles were being met and immediate actions were taken to ensure that the elevated building area temperatures had not caused any components to exceed their qualified life. During the performance of maintenance activities, the applicant identified and corrected conditions that could be potentially adverse to maintaining the EQ of Electrical Components program. On January 6, 2007, the applicant identified a degraded EQ motor splice through the corrective action program. The applicant promptly evaluated the issue for its impact on operability to ensure it met the requirement of the EQ file.

In reviewing operating experience in Assignment Report (AR) 00465770 in TMI-1 PBD TM-PBD-AMP-B.3.1.3, the staff noted that the feedwater valve FW-V-16B/17B cabling was subject

to 153.8 degrees F (68 degrees C) in the Intermediate Building. The EQ file ES-010T temperature for this zone is 110 degrees F. The applicant concluded that there was not immediate danger of end of life. The staff requested the applicant to explain why there was no immediate danger of end of life of this cable and how this increased temperature affected the EQ of this cable. The staff will consider issuing an RAI requesting that the applicant address this issue. A discussion of the issue and the results of the staff's review of the applicant's response to the RAI will be provided in the forthcoming SER.

In conclusion, the staff compared 7 of the 10 elements (as discussed in paragraph 4 on page 2 of this report) in the applicant's program and verified that those 7 elements are consistent with those recommended in GALL Report AMP X.E1, except in the areas in which the staff felt additional clarification might be warranted as described above, which will be discussed in the forthcoming SER.