



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

January 8, 2018

Mr. William F. Maguire
Site Vice President
River Bend Station, Unit 1
Entergy Operations, Inc.
5485 U.S. Highway 61 N
St. Francisville, LA 70775

SUBJECT: OPERATING EXPERIENCE AUDIT REPORT REGARDING RIVER BEND
STATION, UNIT 1 LICENSE RENEWAL APPLICATION REVIEW (CAC NO.
MF9757)

Dear Mr. Maguire:

By letter dated May 25, 2017 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML17153A282), Entergy Operations, Inc. (the applicant) submitted an application to the U.S. Nuclear Regulatory Commission (NRC) pursuant to Title 10 of the *Code of Federal Regulations* Part 54, "Requirements for Renewal of Operating Licenses for Nuclear Power Plants," to renew the operating license NPF-47 for River Bend Station, Unit 1. On October 13, 2017, the NRC staff completed an Operating Experience Audit. The audit report is enclosed

If you have any questions, please contact me by telephone at 301-415-4084 or via e-mail at Emmanuel.Sayoc@nrc.gov.

Sincerely,

/RA/

Emmanuel Sayoc, Project Manager
License Renewal Project Branch
Division of Materials and License Renewal
Office of Nuclear Reactor Regulation

Docket No. 50-458

Enclosure:
Audit Report

cc w/encl: Distribution via Listserv

SUBJECT: AGING MANAGEMENT PROGRAMS AUDIT REPORT REGARDING RIVER BEND STATION, UNIT 1 LICENSE RENEWAL APPLICATION REVIEW (CAC NO. MF9757) DATED

DISTRIBUTION:

E-MAIL:

PUBLIC

RidsNrrDmlr Resource
 RidsNrrDmlrMrpb Resource
 RidsNrrDmlrMenb Resource
 RidsNrrDmlrMphb Resource
 RidsNrrDmlrMccb Resource
 RidsNrrDmlrMvib Resource
 RidsNrrPMRiverBend Resource
 RidsRgn4MailCenter
 ESayoc, NRR
 AWong, NRR
 EOesterle, NRR
 SBloom, NRR
 DAlley, NRR
 SRuffin, NRR
 BWittick, NRR
 TMartinezNavedo, NRR

SBailey, NRR
 LRegner, NRR
 TSherwin, OGC
 DMcIntyre, OPA
 SBurnell, OPA
 AMoreno, OCA
 JSowa, RIV
 BParks, RIV
 GPick, RIV
 JKozal, RIV
 CYoung, RIV
 GWerner, RIV
 VDricks, RIV
tbrous1@entergy.com
DLach@entergy.com
TSCHENK@entergy.com
alacey@entergy.com

ADAMS Accession Number: **ML17347A383**

*Concurred via e-mail

OFFICE	PM:MRPB:DMLR	LA:MRPB:DMLR	PM:MCCB:DMLR	BC:MRPB:DMLR	PM:MRPB:DMLR
NAME	ESayoc	YEdmonds (SLent for)	BRogers	EOesterle w/comments	ESayoc
DATE	12/26/17	12/22/17	12/28/17	1/3/18	1/8/18

OFFICIAL RECORD

River Bend Station, Unit 1, License Renewal Operating Experience Audit Report

I. Introduction

On October 2 through 13, 2017, the U.S. Nuclear Regulatory Commission (NRC) Division of Materials and License Renewal (DMLR) performed an audit of Entergy Louisiana, LLC and Entergy Operations, Inc. (EOI) (the applicant), River Bend Station, Unit 1 (RBS), as part of the NRC staff's review of the RBS license renewal application (LRA) at a facility located in Rockville, Maryland. The purpose of the audit was for the NRC staff to perform an independent review of plant specific operating experience (OE) to identify examples of age related degradation, as documented in the applicant's corrective action program database. The regulatory bases for the audit was Title 10 of the *Code of Federal Regulations*, Part 54 (10 CFR Part 54), "Requirements for Renewal of Operating Licenses for Nuclear Power Plants,". The staff also considered the guidance contained in NUREG-1800, "Standard Review Plan for Review of License Renewal Applications for Nuclear Power Plants," Revision 2 (SRP-LR) and NUREG- 1801, Rev. 2, "Generic Aging Lessons Learned (GALL) Report," dated December 2010.

II. Background

The NRC staff performed the review to identify pertinent examples of OE, concerning age related degradation, as documented in the applicant's corrective action program database. The identified OE examples will be evaluated during the staff's subsequent technical review and auditing of aging management programs (AMPs), time limited aging analyses (TLAAs) and aging management review (AMR) line items. The staff's identification and evaluation of pertinent OE and additional related documentation, provides a basis for the staff's conclusions on the ability of the applicant's proposed AMPs and TLAAs to manage the effects of aging in the period of extended operation.

III. Audit Activities

The following sections discuss the areas reviewed by the staff and identified examples of pertinent OE.

LRA AMP B.1.1, Aboveground Metallic Tanks

Audit Activities. The staff conducted an independent search of the applicant's operating experience database using keywords: "corros," "flaw," "leak," "tank," and "through wall." No significant plant-specific operating experience associated with the Aboveground Metallic Tanks program was noted by the staff during its review.

LRA AMP B.1.2, Bolting Integrity

Audit Activities. The staff conducted an independent search of the applicant's operating experience database using keywords: "bolt," "preload," "torque," "loose," "crack," "leak," "cap screw," "corrosion," "stress corrosion cracking," "SCC," "molybdenum," "disulfide," and "MoS₂."

The table below lists the documents that were reviewed by the staff and were found relevant to the Bolting Integrity Program. These documents were identified in the staff's search of the

applicant's operating experience database. The results of the review of relevant operating experience is documented in the AMP Audit Report (Agencywide Documents Access and Management System (ADAMS) Accession No. ML17346A732).

Relevant Documents Reviewed

Document	Description	Revision / Date
Condition Report (CR)-RBS-2004 02144	Corrosion on underwater service water pump bolts	07/29/2004
CR-RBS-2009-01468	Corrosion on service water cooling motor operated valve bolt head	03/26/2009
CR-RBS-2009-06148	Inadequate torque of bolting in diesel generator	12/01/2009
CR-RBS-2009-02748	Oil leak and loose bolt on EGS-EG1BA	06/17/2009
WO#198581	Oil leak and loose bolt on EGS-EG1BA	06/17/2009
CR-RBS-2015-02393	Normal service water leaks from different bolts	03/26/2015
CR-RBS-2011-07429	Corrosion in bolts of fire water isolation valves	10/14/2011
WO#293656	Corrosion in bolts of fire water isolation valves	06/28/2012
CR-RBS-2015-06533	FitzPatrick operating experience on corrosion of cap screws applicable to River Bend Station	09/08/2015

LRA AMP B.1.3, Boraflex Monitoring

Audit Activities. The staff conducted an independent search of the applicant's operating experience database using keywords: "Boraflex," "BADGER," "Racklife," and "neutron absorber."

The table below lists the documents that were reviewed by the staff and were found relevant to the Boraflex Monitoring Program. These documents were identified in the staff's search of the applicant's operating experience database. The results of the review of relevant operating experience is documented in the AMP Audit Report (ADAMS Accession No. ML17346A732).

Relevant Documents Reviewed

Document	Description	Revision / Date
CR-RBS-2003-00053	Racklife Results	01/10/2003
CR-RBS-2011-06932	Boraflex Surveillance Program Document (BISCO) Missing	09/21/2011
CR-RBS-2012-02166	BISCO Document Found	03/27/2012
CR-RBS-2012-02995	Racklife Boron Loss Assumption Exceeded	05/02/2012
CR-RBS-2013-07478	Removal of Long-Term Surveillance Coupon	12/09/2013

LRA AMP B.1.4, Buried and Underground Piping and Tanks Inspection

Audit Activities. The staff conducted an independent search of the applicant’s operating experience database using keywords: “buried,” “coat,” “corrosion,” “concrete,” “crack,” “wrap,” “wall loss,” “vault,” “underground,” “through wall,” “piping,” “min wall,” “microbiologic,” “loss of material,” “holiday,” “flaw,” “excavat,” and “leak.”

The table below lists the documents that were reviewed by the staff and were found relevant to the Buried and Underground Piping and Tanks Inspection program. These documents were provided by the applicant or were identified in the staff’s search of the applicant’s operating experience database. The results of the review of relevant operating experience is documented in the AMP Audit Report (ADAMS Accession No. ML17346A732).

Relevant Documents Reviewed

Document	Description	Revision / Date
CR-RBS-2013-00122	Visual Inspection of Buried Pipe Line CNS-750-497-004	01/08/2013
CR-RBS-2012-07706	Visual Inspection of Buried Pipe Lines CNS-006-251, LWS-004-586, and IAS-001-165	12/17/2012
CR-RBS-2012-07163	Visual Inspection of Buried Pipe Line CSH-016-054	11/19/2012
CR-RBS-2013-06354	UT Examination Readings Taken on Buried Pipe Line Number CWS-020-035-4	10/02/2013
CR-RBS-2010-04298	Cathodic Protection Test Station That Had Less Than The Acceptance Criteria of -0.850 Volts	08/31/2010

Document	Description	Revision / Date
CR-RBS-2014-03095	Equipment Deficiencies on the Cathodic Protection System	06/26/2014

LRA AMP B.1.5, BWR Control Rod Drive (CRD) Return Line Nozzle

Audit Activities. The staff conducted an independent search of the applicant’s operating experience database using keywords: “control rod drive,” “return line nozzle,” “crack,” and “weld.”

No significant plant-specific operating experience associated with the BWR CRD Return Line Nozzle Program was noted by the staff during its review.

LRA AMP B.1.6, BWR Feedwater Nozzle

Audit Activities. The staff conducted an independent search of the applicant’s operating experience database using keywords: “feedwater nozzle,” “crack,” “fatigue,” and “weld.” No significant plant-specific operating experience associated with the BWR Feedwater Nozzle Program was noted by the staff during its review.

LRA AMP B.1.7, BWR Penetrations

Audit Activities. The staff conducted an independent search of the applicant’s operating experience database using keywords: “penetration,” “nozzle,” “safe-end,” and “cracking.”

The table below lists the documents that were reviewed by the staff and were found relevant to the audit. These documents were provided by the applicant or were identified in the staff’s search of the applicant’s operating experience database.

Relevant Documents Reviewed

Document	Description	Revision / Date
RBS B.1.7	Program Basis Document, License Renewal Program Book – BWR Penetrations	Rev. 0
EN-FAP-LR-007	Evaluation of Aging Management Programs	Rev. 6
CR-RBS-2002-01401	Enhanced VT-2 on weld, and accessibility issues	03/27/2003
CR-RBS-2017-06676	Inspection of nozzle to vessel weld cannot be confirmed	09/13/2017

LRA AMP B1.8, BWR Stress Corrosion Cracking

Audit Activities. The staff conducted an independent search of the applicant’s operating experience database using keywords: “SCC,” “IGSCC,” “stress corrosion,” “crack,” “weld,” and “safe end.”

The table below lists the document that was reviewed by the staff and was found relevant to the BWR Stress Corrosion Cracking Program. This document was identified in the staff's search of the applicant's operating experience database. The results of the review of relevant operating experience are documented in the AMP Audit Report (ADAMS Accession No. ML17346A732).

Relevant Documents Reviewed

Document	Description	Revision / Date
CR-RBS-2010-05935	To achieve the goal of not performing inservice inspections behind the biological shield wall in Refueling Outage (RF) 17, it is necessary to include additional inservice inspection examination in the RF-16 scope in order to meet the percentage requirements of BWRVIP-75-A for welds susceptible to intergranular stress corrosion cracking.	11/15/2010

LRA AMP B.1.9, BWR Vessel ID Attachment Welds Program

Audit Activities. The staff conducted an independent search of the applicant's operating experience database using keywords: "BWRVIP," "integral attachment," "ID attachment," "attachment weld," "inservice," and "inspection."

The table below lists the documents that were reviewed by the staff and were found relevant to the audit. These documents were provided by the applicant or were identified by the staff during its search of the applicant's operating experience database or its review of CRs that were appropriately referenced and summarized in the operating history section of the applicant's program evaluation report for LRA AMP B.1.9, "BWR Vessel ID Attachment Welds." The results of the review of relevant operating experience is documented in the In-Office Audit Report.

Relevant Documents Reviewed

Document	Description	Revision / Date
RBS License Renewal Application, Section B.1.9	BWR Vessel ID Attachment Welds	Revision 0
NUREG-1801, Chapter XI, Section (AMP) XI.M9	Generic Aging Lessons Learned (GALL) Report, AMP XI.M9, BWR Vessel ID Attachment Welds	Revision 2
RBS License Renewal Application, Section 3.1 (Including LRA AMR Tables 3.1.1 and 3.1.2-1 in the Section 3.1)	Reactor Vessel Internals, and Reactor Coolant System	Revision 0
RBS License Renewal Application, Appendix A, Updated Safety Analysis Report (USAR), Section A.1, Subsection A.1.9	BWR Vessel ID Attachment Welds	Revision 0
RBS-EP-15-00006, Section 4.5	RBS License Renewal Project, Aging Management Program Evaluation Report, Class 1 Mechanical, BWR Vessel ID Attachment Welds	Revision 0
RBS-ME-15-00001	RBS License Renewal Project, Aging Management Review of the Reactor Pressure Vessel	Revision 0
EN-FAP-LR-007	Evaluation of Aging Management Programs	Revision 6, 02/18/2015
EN-FAP-LR-004	Mechanical System Screening and Aging Management Reviews	Revision 8, 08/24/2016
USAR, Chapter 3	Design of Structures, Components, Equipment, and Systems	Revision 24
USAR Chapter 4	Reactor	Revision 24
USAR Chapter 5	Reactor Coolant System and Connected Systems	Revision 24

Document	Description	Revision / Date
BWRVIP-48-A (EPRI TR No. 1009948)	BWR Vessel and Internals Project, Vessel ID Attachment Weld Inspection and Evaluation Guidelines	2004
Entergy Letter No. RRB-47362	Request for Alternative in Accordance with 10 CFR 50.55a(a)(3)(i), Use of Boiling Water Reactor Vessel and Internals Project (BWRVIP) Guidelines in Lieu of Specific American Society of Mechanical Engineers (ASME) Code Requirements, River Bend Station (ADAMS Accession No. ML13141A257)	05/16/2013
NRC Relief Request and Safety Evaluation	River Bend Station, Unit 1 – Request for Relief No. RBS-ISI-019, Alternative to Use Boiling Water Reactor Vessel and Internals Project Guidelines in Lieu of ASME Code, Section XI Requirements for the Fourth 10-Year Inservice Inspection Interval (ADAMS Accession No. ML14127A327)	05/30/2014
Condition Report Nos. CR-RBS-2014-00253 and CR-RBS-2014-00016	Inspections per GE SIL 658 for Feedwater Sparger End Brackets	2014
RBS-EP-13-00004	RBS RF-17 Reactor Vessel Internals Management Program Post-Outage Report	05/13/2013
RBS-EP-15-00014	RBS RF-18 In-Vessel Visual Inspection (IVVI) Final Report	Rev. 0

LRA AMP B.1.10, BWR Vessel Internals Program

Audit Activities. The staff conducted an independent search of the applicant’s operating experience database using keywords: “cracking,” “stress corrosion,” “embrittlement,” “wear,” “loss of preload,” “pitting,” “reactor internal,” “X-750,” “CASS,” and “fracture toughness.”

The table below lists the documents that were reviewed by the staff and were found relevant to the audit. These documents were provided by the applicant or were identified by the staff during its search of the applicant’s operating experience database or its review of contractors reports (CRs) that were referenced and summarized in the operating history section of the applicant’s program evaluation report for LRA AMP B.1.10, “BWR Vessel Internals Program.” The results of the review of relevant operating experience is documented in the AMP Audit Report (ADAMS Accession No. ML17346A732).

Relevant Documents Reviewed

Document	Description	Revision / Date
CR-RBS-2013-04927	Condition Report for the Core Shroud Assembly (See summary on page 46 of RBS-EP-15-00003)	2013
CR-RBS-2015-01976	Condition Report for the Core Shroud H8 Horizontal Weld (See summary on page 50 of RBS-EP-15-00003)	2015
CR-RBS-2013-05645	Condition Report for the Low Pressure Coolant Injection (LPCI) Couplings and Their Welds (See summary on page 47 of RBS-EP-15-00003)	2013
CR-RBS-2013-04094	Condition Report for the Top Guide Assembly (See summary on page 45 of RBS-EP-15-00003)	2013
CR-RBS-2000-00686	Condition Report for the Steam Dryer Support Ring Indications – Year 2000 Inspections (See summary on page 43 of RBS-EP-15-00003)	2000
CR-RBS-2006-01770	Condition Report for Steam Dryer Support Ring Indications – Year 2006 Inspections (See summary on pages 43 and 44 of RBS-EP-15-00003)	2006
CR-RBS-2008-00809 and CR-RBS-2008-00971	Condition Report for New Steam Dryer Bank Vertical Weld Indications – Year 2008 Inspections (See summary on page 44 of RBS-EP-15-00003)	2008

LRA AMP B.1.11, Coating Integrity

Audit Activities. The staff conducted an independent search of the applicant’s operating experience database using keywords: “blister,” “block,” “clog,” “coat,” “delam,” “flak,” “foul,” “holiday,” “lined,” “lining,” “peel,” “spall,” and “wear.”

No significant plant-specific operating experience associated with the Coating Integrity program was noted by the staff during its review.

LRA AMP B.1.12, Compressed Air Monitoring

Audit Activities. The staff conducted an independent search of the applicant’s operating experience database using keywords: “instrument air,” “air,” and “leak.”

No significant plant specific operating experience associated with the Compressed Air Monitoring program was noted by the staff during its review.

LRA AMP B.1.13, Containment Inservice Inspection – IWE

Audit Activities. The staff conducted an independent search of the applicant’s operating experience database using keywords: “bellows,” “blister,” “bolt,” “containment” “corros,” “coat,” “degrad,” “drywell,” “IWE,” “loss of material,” “pit,” and “suppression.”

No significant plant-specific operating experience associated with the Containment Inservice Inspection - IWE Program was noted by the staff during its review.

LRA AMP B.1.14, Containment Leak Rate

Audit Activities. The staff conducted an independent search of the applicant’s operating experience database using keywords: “LLRT [local leak rate test],” “ILRT [integrated leak rate test],” “valve,” “Secondary Bypass Leakage,” and “Airlock.”

The table below lists the documents that were reviewed by the staff and were found relevant to the Containment Leak Rate program. These documents identified in the staff’s search of the applicant’s operating experience database. The results of the review of relevant operating experience is documented in the AMP Audit Report (ADAMS Accession No. ML17346A732).

Relevant Documents Reviewed

Document	Description	Revision / Date
CR-RBS-2008-01906	Leakage Path from the Reactor Pressure Vessel (RPV) to the Drywell Sumps was observed during the ILRT:	03/01/2008
CR-RBS-2008-01924	Identifies RVP leakage. Identifies valve V107 as the valve expending water	02/26/2008
CR-RBS-2008-02009	Identifies leak path (through one or more scram inlet valves)	02/27/2008
CR-RBS-2016-00401	Performance of personnel airlocks 10 CFR Part 50 Appendix J testing.	01/16/2016
CR-RBS-2014-04151	No process mechanism providing running LLRT summation. Since 1999 summation has not been kept as noted in NEI 94-01 and NRC Inspection Procedure 61720.	08/21/2014

Document	Description	Revision / Date
CR-RBS-2016-00401	Conflict between procedure SEP-APJ-004 and TS (Drywell Isolation Valves). SR 3.6.5.3.3 states that the frequency of verifying each drywell isolation manual valve and blind flange is required to be closed during accident conditions, is closed; frequency of testing to be prior entering MODE 2 or 3 from MODE 4, if not performed in the previous 92 days. SEP-APJ-004 Note 25 limits testing to 20 months.	01/16/2016

LRA AMP B.1.15, Diesel Fuel Monitoring

Audit Activities. The staff conducted an independent search of the applicant’s operating experience database using keywords: “biological,” “fuel oil,” “block” and “tank.”

The table below lists the documents that were reviewed by the staff and were found relevant to the diesel fuel monitoring program. These documents were identified in the staff’s search of the applicant’s operating experience database. The results of the review of relevant operating experience is documented in the AMP Audit Report (ADAMS Accession No. ML17346A732).

Relevant Documents Reviewed

Document	Description	Revision / Date
CR-RBS-2015-05171	Strainer blockage	07/20/2015
CR-RBS-2016-03266	Fuel Sampling after draining 6 Gallons	04/28/2016

LRA AMP B.1.16, Environmental Qualification (EQ) of Electrical Components

Audit Activities. The staff conducted an independent search of the applicant’s operating experience database using keywords: “environmental qualification equipment,” “environmental qualification component,” and “environmental qualification – aged related degradation.” The table below lists the documents that were reviewed by the staff and were found relevant to the Environmental Qualification of Electrical Components. These documents were identified during the staff’s search of the applicant’s operating experience database. The results of the review of relevant operating experience is documented in the In-Office Audit Report Document.

Relevant Documents Reviewed

Document	Description	Revision/ Date
CR-RBS-2009-01231/35	NRC Inspection Report (IR) 08-06 for Component Design Basis Inspection (CDBI) identified the following Non-Cited Violation (NCV). The IR states “With the	12/31/09

	<p>exception of those molded-case circuit breakers associated with containment isolation circuits (Technical Requirements Manual Section TR 3.8.11 and TR 3.8.12); molded-case circuit breakers were not under periodic test and preventive maintenance (PM) program that assessed age-related degradation of electrical components in the breakers.” CR 09-RBS-1231/35 was initiated to ensure the NRC’s concerns were adequately addressed regarding the molded-case circuit breakers.</p>	
--	--	--

LRA AMP B.1.17, External Surfaces Monitoring

Audit Activities. The staff conducted an independent search of the applicant’s operating experience database using keywords: “corros,” “leak,” “loss of material,” “piping,” and “rust.”

The table below lists the documents that were identified during the staff’s search of the applicant’s operating experience database and were found relevant to the External Surfaces Monitoring program. The results of the review of relevant operating experience is documented in the AMP Audit Report (ADAMS Accession No. ML17346A732).

Relevant Documents Reviewed

Document	Description	Revision / Date
CR-RBS-2014-03098	Service Water Primary 20 inch return header has pipe weld degradation, around entire diameter up to 1/4 inch deep. This degradation appears to be due to continuous rain water runoff from various components above the weld. The SWP piping is severely rusted, pitted and brittle in two areas of the weld, directly on top and bottom of the pipe.	06/26/2014
CR-RBS-2014-03643	General coating degradation on Standby Service Water piping and associated components in the plant area when the F-Tunnel and G-Tunnel connect. General surface coating degradation is present on the exterior of the Service Water Piping at this location.	07/24/2014

Document	Description	Revision / Date
CR-RBS-2015-03429	Leak from SWC-006-059. The coating around the valve, pipe, and tube steel support has degraded and the underlying metal is corroded. This leak is also causing ponding at the base of pipe supports SWP-PSR8252A4 and SWP-PSR8232A4 which has caused corrosion of the tube steel connection to the embed plate in the slab.	05/08/2015
CR-RBS-2016-02355	NRC Resident Observations: 10) SWP Corrosion control. Located in various tunnels. Numerous signs of corrosion were observed. How is corrosion being managed in these areas? What is effect on SWP? Is everything in spec? What is monitoring corrosion of equipment?" What is threshold for action?	03/22/2016

LRA AMP B1.18, Fatigue Monitoring

Audit Activities. The staff conducted an independent search of the applicant's operating experience database using keywords: "fatigue," "cycle," "crack," "usage factor," and "CUF."

The table below lists the documents that were reviewed by the staff and were found relevant to the Fatigue Monitoring Program. This documents were identified in the staff's search of the applicant's operating experience database. The results of the review of relevant operating experience are documented in the AMP Audit Report (ADAMS Accession No. ML17346A732).

Relevant Documents Reviewed

Document	Description	Revision / Date
CR-RBS-2016-00656	The FatiguePro software uses the COLLECT program to retrieve cycle and fatigue related data from the ERIS computer. During the retrieval of Cycle 18 data, it was noticed that the COLLECT program unexpectedly stopped automatically recording data from November 2012 to September 2013.	1/22/2016
CR-RBS-2017-05964	The procedure for fatigue management (EDP-MP-05) has outdated information, calculations and other technical issues. These should be resolved as part of the license renewal enhancements for the Fatigue Management Program.	8/10/2017

LRA AMP B.1.19, Fire Protection

Audit Activities. The staff conducted an independent search of the applicant’s operating experience database using keywords: “Halon 1301,” “fire suppression agent,” “fire barriers,” “fire wraps,” “fire damming material,” “fire penetration seals,” “shrinkage,” and “fire doors.”

The table below lists the documents that were reviewed by the staff and were found relevant to the fire protection program. These documents were identified in the staff’s search of the applicant’s operating experience database. The results of the review of relevant operating experience is documented in the AMP Audit Report (ADAMS Accession No. ML17346A732).

Relevant Documents Reviewed

Document	Description	Revision / Date
CR-RBS-2008-04282	During the performance of FPP-0101 Inspection H-5 Halon System, normal switch gear, CAS below floor, system switch is in on the reserved bottle. H-5 Reserve is out-of-service due to low pressure, but not empty. H-5 main bottle is full and is ready for service. Switch needs to be on the main bottle.	07/08/2008
CR-RBS-2008-05747	Control Building operators found three normally closed fire doors slightly open and unlatched.	09/30/2008
CR-RBS-2012-00578	Thermo-Lag wrap on conduits ICX152 RE and ICX152 RF is deteriorating.	01/24/2012
CR-RBS-2012-06706	The Fukushima Flooring Walk-down identified two cracks in concrete that exceeded 0.04” width.	10/25/2012
CR-RBS-2013-00857	NS-123-11 fire door leading from T-Tunnel 123 to hot machine shop stairwell will not close and latch shut on its own.	02/13/2013
CR-RBS-2014-00514	While performing the Maintenance Rule Structural Inspection of the Control Building Division II, two deficiencies were noted: (1) an 1/8” cracking on the fire proof coating on the overhead girders supporting the 116’ elevation, and (2) one column of the west side of the room showed longitudinal cracks on the cement-like fireproofing.	02/04/2015
CR-RBS-2015-01868	SRV RV41D and SRV RV47D have damaged on missing divisional separation fire wrap.	03/10/2015

LRA AMP B.1.20, Fire Water System Program

Audit Activities. The staff conducted an independent search of the applicant’s operating experience database using keywords: “biofoul,” “block,” “clog,” “coat,” “corros,” “flaw,” “foul,” “leak,” “microbiologic,” “MIC,” “pit,” “recur,” “rupture,” “sprinkler,” “tank,” and “through-wall.”

The table below lists the documents that were reviewed by the staff and were found relevant to the Fire Water System program. These documents were identified in the staff’s search of the applicant’s operating experience database. The results of the review of relevant operating experience is documented in the AMP Audit Report (ADAMS Accession No. ML17346A732).

Relevant Documents Reviewed

Document	Description	Revision/ Date
CR-RBS-2007-4985	Leaking sprinkler head in the turbine building.	11/09/2007
CR-RBS-2008-0600	Crack detected on both sides of the 90 elbow on the water gong alarm line for valve FPW-98.	10/15/2008
CR-RBS-2009-0694	FPW-V164 juncture and piping is greatly corroded. The piping downstream of where the valve joins the pipe is visibly pitted by the corrosion. The floor underneath the valve is rust stained.	02/09/2009
CR-RBS-2009-2516	During execution of WO 183858 it was noted that both runs of vertical piping had extensive corrosion where the pipe nipples were screwed into the valves. On close examination, the piping is leaking because the threads are deteriorated from the inside.	02/09/2009
CR-RBS-2010-0160	During inspection of FPW-STR6A the inlet piping at the strainer has a large amount of rust build up on the pipe. There are rust corrosion spots inside pipe, about the size of a silver dollar. The pipe has a restriction of flow but it is not totally plugged.	01/12/2010
CR-RBS-2010-1240	A corrosion spot was detected the on piping tee to FPW-P2. A pre-inspection walk down of the area identified a small amount of water seepage at the corrosion spot.	03/18/2010
CR-RBS-2010-6444	The tee upstream of FPW-V151 has a small through-wall leak that has water seeping out of it.	12/09/2010

CR-RBS-2011-6297	Mud was found in the SWC-FN1E riser pipes. Mud has accumulated in the dead end of the riser pipes.	08/23/2011
CR-RBS-2012-1511	This CR recommends pro-active replacement of all pipe and fittings comprising the fire protection water jockey pump (FPW-P3) discharge piping. The identified condition does not currently cause fire protection equipment to be inoperable or unavailable. The discharge piping of FPW-P3 has excessive corrosion and leakage.	02/27/2012
CR-RBS-2012-4629	While performing a monthly walk down of the degraded suction tee (FPW-010-073) to the electric driven fire pump (FPW-P2), a step change in degradation was noticed. Based on visual inspection of the component and reinforced by the two visible areas on the tee, water is seeping out.	07/16/2012
CR-RBS-2013-3371	There is a pin hole size leak in the pipe elbow of FPW-P3, fire water jockey pump, discharge into FPW-P2, electric fire pump, header. The hole is leaking about 25 drops per minute (dpm).	04/29/2013
CR-RBS-2014-1059	Corrective Action #14 was issued to document the repair of a through-wall leak on line FPW-014-070 that was identified under CR-RBS-2005-03787.	03/04/2014
CR-RBS-2014-4979	During the removal of a tagout on FPW-P2 (motor driven fire pump), the pump and both diesel fire pumps (FPW-P1A and FPW-P1B) started automatically. Upon investigation, operators concluded that the sensing line to FPW-PS107, the pressure switch for the motor driven fire pump, must have become clogged.	10/08/2014
CR-RBS-2014-5761	There is a pin-hole leak in FPW-P3 (jockey pump) discharge line in the electric motor driven fire pump room above the eyewash station. It is dripping approximately 4-8 dpm.	11/11/2014
CR-RBS-2015-6244	During rounds it was noted by the outside operator that there was a noticeable amount of water on the floor by the jockey fire pump. Upon further investigation, a small drip on the pipe was found in between FPW-V112 and FPW-V117.	08/27/2015

	The operator wiped it down and noticed a small pin-hole leak in this section of piping.	
CR-RBS-2016-4235	The chemistry of the fire protection water in the storage tanks is monitored each quarter. During sampling, about 200 milliliters of rusty water drained out. Over the last few times that these samples have been collected, the sample flow has been decreasing.	06/07/2016
CR-RBS-2016-4759	The main control room received a report that there was a rupture on the main fire header in the main admin building/warehouse and that the leak is spraying on safety-related standby motors, which have their associated space heaters energized	06/07/2016
CR-RBS-2016-8164	A 60 dpm leak was identified coming from a joint in the fire water jockey pump discharge line to the B diesel fire pump. The leak is in the section of the pipe that is in the B diesel fire pump room, at the pipe support that is supporting this discharge line.	12/04/2016
CR-RBS-2016-8305	The three quarter inch piping between FPW-V195, the discharge header drain valve for FPW-P1B, diesel driven fire pump, is degraded and has a pinhole leak where it ties into piping.	12/11/2016

LRA AMP B.1.21, Flow-Accelerated Corrosion

Audit Activities. The staff conducted an independent search of the applicant’s operating experience database using keywords: “cavit,” “FAC,” “flow accelerated corrosion,” “min wall,” and “piping.”

The table below lists the documents that were identified during the staff’s search of the applicant’s operating experience database and were found relevant to the “Flow accelerated corrosion” program. The results of the review of relevant operating experience is documented in the AMP Audit Report (ADAMS Accession No. ML17346A732).

Relevant Documents Reviewed

Document	Description	Revision / Date
CR-RBS-2009-04977	FAC #410 (FWS009035RL1) located on line FWS-012-035 has required min wall thickness of 0.736. Current measured wall thickness is 0.744. Component is acceptable based on a 14-month cycle 16.	10/03/2009
CR-RBS-2010-00610	2009 EPRI [Electric Power Research Institute] reported bug in CHECWORKS software that affects all versions. Bug only affects modeled pipe where partial replacements have occurred.	02/04/2010
CR-RBS-2010-03404	Evaluating OE30018, "unit shutdown due to cavitation induced leak in core spray piping." All RBS ECCS min flow piping downstream of an orifice was analyzed. OE is applicable where high velocities (>20 feet per second (fps)) exist. Five have >20 (20.9fps) and five have near 20 (18.88fps).	07/27/2010
CR-RBS-2011-01709	FAC #412 Class 1 Feedwater elbow reading is 1.325. Tcrit = 1.461 Tnom = 1.788 (low reading appears to be counterbore on the elbow side of weld but pipe clamp prevents further readings to be taken.	02/02/2011
CR-RBS-2013-01348	FAC item 219 (CNM027076EL1) expanding elbow on line CNM-030-085 not acceptable. A very localized area (1 inch by 1 inch) contains a low reading of 0.350 inches at the toe of the weld in the downstream attached piping. Additional engineering analysis should be performed to accept the component or repair degraded area.	02/22/2013
CR-RBS-2015-05024	Ran with MSR out of service for 2 weeks due to a steam leak on manway Increased potential for FAC and erosion due to extended operation of normally isolated lines. Recommends inspections of specific components.	07/14/2015

Document	Description	Revision / Date
CR-RBS-2015-08248	Potential valve leak: Perform FAC inspection on downstream piping DTM-00 4-151 during RF19 or next plant shutdown. Perform FAC inspection on condenser connection 29 during RF19.	11/17/2015

LRA AMP B.1.22, Inservice Inspection

Audit Activities. The staff conducted an independent search of the applicant's operating experience database using the keywords: "cracking," "leak," "wear," "loss of material," "failure," "degradation," "flaw," "inspection," "repair," and "weld."

The table below lists the documents that were reviewed by the staff and were found relevant to the audit. These documents were provided by the applicant or were identified in the staff's search of the applicant's operating experience database.

Relevant Documents Reviewed

Document	Description	Revision / Date
RBS B.1.22	Program Basis Document, License Renewal Program Book – Inservice Inspection	Rev. 0
EN-FAP-LR-007	Evaluation of Aging Management Programs	Rev. 6
CR-RBS-2002-01401	Enhanced VT-2 on weld, and accessibility issues	03/27/2003
CR-RBS-2002-00255	Indications detected in weld in RCIC during mag particle examinations	02/12/2002
CR-RBS-2007-05190	Class 2 weld under-counted by 354 welds	11/20/2007
CR-RBS-2013-05645	Missed inspection on Internals Weld 6-1a	08/28/2013
CR-RBS-2013-06927	Miss-identified weld resulted erroneous OAR-1 submitted	11/04/2013
CR-RBS-2014-02350	Reactor Vessel Head Flange leakoff line not inspected. Potential Code non-compliance	05/13/2014
CR-RBS-2015-03160	Incorrect database resulted miss-counted Class 3 Cat D-A welds. Resulted fewer welds being VT examined during Intervals 1 and 2. Code Compliance issue.	04/28/2015
CR-RBS-2015-0577	Incorrect database resulted miss-counted support attachments. Resulted fewer supports being VT examined during Intervals 1 and 2. Code Compliance issue	07/15/2015
RBG-47100	Inservice Inspection Plan for the Third 10-year Interval	01/17/2011
RBG-47729	Resubmittal of Owner’s Activity Report	01/09/2017
ML010430333	NRC Inspection Report 05000458/2008002	05/09/2008
LO-RLO-2011-00108	Containment Inservice Inspection focused assessment	12/03/2011
LO-RLO-2011-00039	Performance Snapshot Assessment - Inservice Inspection activities	02/23/2016

LRA AMP B.1.23, Inservice Inspection – IWF

Audit Activities. The staff conducted an independent search of the applicant’s operating experience database using keywords: “IWF, “hanger,” “support,” pipe support,” ASME,” “corrosion,” and “bolt.”

The table below lists the documents that were reviewed by the staff and were found relevant to the Inservice Inspection – IWF program. These documents were either provided by the applicant or were identified in the staff’s search of the applicant’s operating experience database. The results of the review of relevant operating experience is documented in the AMP Audit Report (ADAMS Accession No. ML17346A732).

Relevant Documents Reviewed

Document	Title	Revision / Date
CR-RBS-2015-05077	Pipe rupture restraints not included in the inservice inspection program (ISI) program database	07/15/2015
CR-RBS-2015-03160	Fewer visual examinations selected and performed than required by the ASME Code for ISI Intervals	04/28/2015
CR-RBS-2016-04848	Failure to perform a successive inspection per ASME IWF-2420	06/28/2016
CR-RBS-2005-04099	VT-3 inspection of spring can found the field set dimension off scale and lock nut loose	12/6/2005
CR-RBS-2005-03856	Documentation of the First Interval ASME Section XI examination for certain components was not clearly documented	11/09/2005
CR-RBS-2011-01793	Conditional release of a snubber transferred from Grand Gulf Nuclear Station, Unit 1 due to supporting documentation not available for procurement engineering (like for like)	02/03/2011
CR-RBS-2014-05427	Review of ISI database indicated that some snubber support locations were missing. All snubbers were determined to be correctly documented in the separate snubber program database.	10/27/2014
CR-RBS-2016-03928	Discrepancy in equipment database. Pipe support incorrectly listed as non-safety-related. Corrected to list support as ASME Code Class 3 Safety-Related	05/24/2016

LRA AMP B.1.24, Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems

Audit Activities. The staff conducted an independent search of the applicant’s operating experience database using keywords: “crane,” “inspection,” “NUREG 0612,” and “ASME B30.2.”

The table below lists the documents that were reviewed by the staff and were found relevant to the B.1.24 Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems. These documents were provided by the applicant/identified in the staff’s search of the applicant’s operating experience database. The results of the review of relevant operating experience is documented in the AMP Audit Report (ADAMS Accession No. ML17346A732).

Relevant Documents Reviewed

Document	Description	Revision / Date
WO-RBS-52457855	Perform Annual Crane Inspection (Fuel Building Bridge Crane)	12/04/2013
WO-RBS-52514220	Perform Annual Crane Inspection (Radwaste Building Crane)	08/26/2014
WO-RBS-52530812	Perform Annual Crane inspection (Fuel Building Crane)	12/03/2014
WO-RBS-52585623	Perform Annual Crane inspection (Radwaste Building Crane)	08/27/2015
CR-RBS-2007-05557	Polar Crane: Gaps in Heavy Load Lifting (maintenance and lifting procedures for RPV and drywell heads, NUREG 0612 sling and rigging requirements – resolved (3CAs), procedures revised)	12/14/2007
CR-RBS-2009-0561	Fuel Building Bridge Crane: Modified crane by welding a drip panel to assembly of the 15 ton hook. No design documentation for alteration found. Concerns for existing welds resolved (5CAs) by testing the 15 ton hook to ASME B30.2 requirements (WO 19071).	02/01/2009

LRA AMP B.1.25, Internal Surfaces in Miscellaneous Piping and Ducting Components

Audit Activities. The staff conducted an independent search of the applicant’s operating experience database using keywords: “biofoul,” “crack,” “corrosion,” “wall loss,” “through wall,” “piping,” “foul,” “leak,” and “loss of material.”

No significant plant-specific operating experience associated with the Internal Surfaces in Miscellaneous Piping and Ducting Components program was noted by the staff during its review.

LRA AMP B.1.26, Masonry Wall

Audit Activities. The staff conducted an independent search of the applicant's operating experience database using keywords: "CMU," "concrete," "crack," "mortar," "masonry," and "spall."

No significant plant-specific operating experience associated with the Masonry Wall Program was noted by the staff during its review.

LRA AMP B.1.27, Non-EQ Electrical Cable Connections

Audit Activities. The staff conducted an independent search of the applicant's operating experience database using keywords: "cable connection - increased resistance," "cable connection - discoloration," "cable connection – contamination," and "cable connection – ohmic heating."

No significant plant-specific operating experience associated with the Non-EQ Electrical Cable Connections was noted by the staff during its review.

LRA AMP B.1.28, Non-EQ Inaccessible Power Cables (>400V)

Audit Activities. The staff conducted an independent search of the applicant's operating experience database using keywords: "cable," "manhole," "submergence," "insulation," "sump," "sump pump," "tan delta," "degraded cable," and "vault."

The table below lists the documents that were reviewed by the staff and were found relevant to the Non-EQ Inaccessible Power Cables (>400V) program. These documents were identified during the staff's search of the applicant's operating experience database. The results of the review of relevant operating experience is documented in the AMP Audit Report (ADAMS Accession No. ML17346A732).

Relevant Documents Reviewed

Document	Description	Revision / Date
CR-RBS-2012-01591	Cable failed Tan Delta test acceptance criteria per W.O.52389658	02/29/2012
CR-RBS-2014-03068`	During inspection, manhole EMH610 was found with 94" of water and in contact with cables (W.O.52561529-01)	06/25/2014
CR-RBS-2014-02825	During inspection, manhole EMH602 was found with 106" of water and in contact with cables (W.O.52561532-01)	06/10/2014
CR-RBS-2015-01765	Outside operator noticed water flowing into electrical manhole. NRC informed	03/07/2015
CR-RBS-2011-01311	Tan Delta test results showed cable in degraded condition. Consult with subject matter expert and EPRI determined replacement not needed	2011
CR-RBS-2012-03590	Cable INPSANJ304 failed Tan Delta test. Water found in cable when cable was cut	05/27/2012
CR-RBS-2013-03834	Manhole EMH36 has been in quarterly trend report due to water intrusion. Issue identified during corrective action QA audit (QA-3-2013-RBS-01)	05/23/2013
CR-RBS-2015-08068	Cable ICWSANK001 phase C failed insulation resistance acceptance criteria (5 meg Ohm vs. 317 meg. Ohm). A new W.R.378544 was generated to repair or replace.	11/09/2015

LRA AMP B.1.29, Non-EQ Insulated Cables and Connections

Audit Activities. The staff conducted an independent search of the applicant's operating experience database using keywords: "cable discoloration," "cable contamination" "cable – insulation aging degradation," "cable – melting," and "cable – embrittlement."

No significant plant-specific operating experience associated with the Non-EQ Insulated Cable and Connections was noted by the staff during its review.

LRA AMP B.1.30, Non-EQ Sensitive Instrumentation Circuits

Audit Activities. The staff conducted an independent search of the applicant's operating experience database using keywords: "Intermediate range monitor," "Power range monitor," "Source range monitor," "Instrumentation circuits," "replace cable," and "electrical insulation."

The table below lists the documents that were reviewed by the staff and were found relevant to the Non-Environmental Qualification Sensitive Instrumentation Circuits. These documents were identified by the staff in the staff's search of the applicant's operating experience database. The results of the review of relevant operating experience is documented in the AMP Audit Report (ADAMS Accession No. ML17346A732).

Relevant Documents Reviewed

Document	Description	Revision / Date
CR-RBS-2010-02318	INPO issued SEE-IN Topical Report (TR) TR10-69 – Cable Aging and Monitoring on May 11, 2010. This TR analyzes power and instrument and control cable failures and events from 2005 – 2009 reported via Nuclear Network. Twelve cable failures have occurred during this five-year period, most because of adverse conditions.	05/20/2010

LRA AMP B.1.31, Oil Analysis

Audit Activities. The staff conducted an independent search of the applicant's operating experience database using keywords: "oil analysis," "wear," and "loss of material."

No significant plant specific operating experience associated with the Oil Analysis program was noted by the staff during its review.

LRA AMP B.1.32, One-Time Inspection

Audit Activities. The staff noted that this is a new program, therefore no plant specific operating experience have been established

No significant plant specific operating experience associated with the One-Time Inspection program was noted by the staff during its review.

LRA AMP B.1.33, One-Time Inspection - Small-Bore Piping

Audit Activities. The staff conducted an independent search of the applicant's operating experience database using the keywords: "weld," "cracking," "crack," "failure," "socket," "socketlet," "weldolet," "butt weld," "thermal," "fatigue," and "leakage."

The table below lists the documents that were reviewed by the staff and were found relevant to the audit. These documents were provided by the applicant or were identified in the staff's search of the applicant's operating experience database.

Relevant Documents Reviewed

Document	Description	Revision / Date
RBS B.1.33	Program Basis Document, License Renewal Program Book – One-Time Inspection - Small-Bore Piping	Rev. 0
EN-FAP-LR-007	Evaluation of Aging Management Programs	Rev. 6
CR-RBS-1993-434	Historical record	07/24/1993
CR-RBS-2001-483	Pin-hole leak at welded plus in leak-off line connection	04/10/2001
CR-RBS-1999-1199	Steam leak on drain line socket weld	07/20/1999
CR-RBS-2010-1844	Leak found in tie-in line	04/22/2010
LER-458-1997-002	through-wall crack in weld on RRS Reactor Recirculation System Vent Valve	10/27/1997

LRA AMP B.1.34, Periodic Surveillance and Preventive Maintenance

Audit Activities. The staff conducted an independent search of the applicant's operating experience database using keywords: "clog," "MIC," "microbiolog," "min wall," and "throughwall."

The table below lists the document that was reviewed by the staff and was found relevant to the Periodic Surveillance and Preventive Maintenance program. The document was identified in the staff's search of the applicant's operating experience database. The results of the review of relevant operating experience is documented in the AMP Audit Report (ADAMS Accession No. ML17346A732).

Relevant Documents Reviewed

Document	Description	Revision / Date
CR-RBS-2009-5426	This CR documents an adverse trend. Performance of an STP is becoming progressively more difficult to accomplish due to system degradation in the carbon steel sections of the plant drain piping. The vast majority of the evolution is spent conducting sump and check valve inspections due to extensive carbon steel corrosion in the drain lines. Additionally, several full days of drain line clearing and troubleshooting were performed.	10/14/2009

LRA AMP B.1.35, Protective Coating Monitoring and Maintenance

Audit Activities. The staff conducted an independent search of the applicant’s operating experience database using keywords: “Service Level I,” “coatings,” “containment,” and “drywell.”

The table below lists the documents that were reviewed by the staff and were found relevant to the Protective Coating Monitoring and Maintenance Program. These documents were identified in the staff’s search of the applicant’s operating experience database. The results of the review of relevant operating experience is documented in the AMP Audit Report (ADAMS Accession No. ML17346A732).

Relevant Documents Reviewed

Document	Description	Revision / Date
CR-RBS-2012-07038	Acceptability and Acceptance Criteria for Galvanized Coatings	11/12/2012
CR-RBS-2017-01513	Four Areas of Degraded Coatings in Drywell	02/15/2017
CR-RBS-2016-07893	RF-17 Drywell Coatings Inspection	11/21/2016
CR-RBS-2015-01390	RF-18 Drywell Coatings Inspection	02/27/2015
CR-2000-00904	Potential Impact of Coating Degradation on ECCS Strainers	04/04/2000
Attachment 10035141	Technical Evaluation for CR-2000-00904 (Attachment to CA-2)	04/04/2000

LRA AMP B.1.36 Reactor Head Closure Studs

Audit Activities. The staff conducted an independent search of the applicant’s operating experience database using keywords: “bolt,” “bolting,” “closure stud,” “stress corrosion cracking,” “wear,” and “cracking.”

The table below lists the documents that were reviewed by the staff and were found relevant to the audit. These documents were provided by the applicant or were identified in the staff’s search of the applicant’s operating experience database.

Relevant Documents Reviewed

Document	Description	Revision / Date
RBS B.1.36	Program Basis Document, License Renewal Program Book – Reactor Head Closure Studs	Rev. 0
EN-FAP-LR-007	Evaluation of Aging Management Programs	Rev. 6
3RBG-47100	Inservice Inspection Plan for the Third 10-year Interval	01/17/2011
CR-RBS-2001-1349	Two depressions detected on vessel flange	10/07/2001

LRA AMP B.1.37, Reactor Vessel Surveillance Program

Audit Activities. The staff conducted an independent search of the applicant’s operating experience database using keywords: “Part 50, Appendix H,” “integrated surveillance,” “ISP,” “capsule,” and “BWRVIP-86.”

The table below lists the documents that were reviewed by the staff and were found relevant to the audit. These documents were provided by the applicant or were identified by the staff during its search of the applicant’s operating experience database or the staff’s review of the LRA, current licensing basis, and current design basis, as well as the staff’s review of the applicant’s program evaluation report for LRA AMP B.1.32, “Reactor Vessel Surveillance.” This includes the staff’s review of the operating history section in the program evaluation report for the AMP. The results of the review of relevant operating experience is documented in the AMP Audit Report (ADAMS Accession No. ML17346A732).

Relevant Documents Reviewed

Document	Description	Revision / Date
LRA Appendix B, Section B.1.37	Reactor Vessel Material Surveillance	Revision 0
LRA Section 4.2.3	Pressure-Temperature Limits	Revision 0
RBS-15-00006	RBS License Renewal Project, Aging Management Program Evaluation Report – Class 1 Mechanical, Reactor Vessel Surveillance	Revision 0
EPRI Report No. 1003346	BWRVIP-86-A: BWR Vessel and Internals Project Updated BWR Integrated Surveillance Program (ISP) Implementation Plan (Non-Public Proprietary Report, ADAMS Accession No. ML023190491)	Revision 0 (A version)

Document	Description	Revision / Date
NRC Safety Evaluation	Safety Evaluation Regarding EPRI Proprietary Reports "BWR Vessel and Internals Project, BWR Integrated Surveillance Program Plan (BWRVIP-78)" and BWRVIP-86 - "BWR Vessel and Internals Project, BWR Integrated Surveillance Program Implementation Plan." (Publicly available Evaluation in ADAMS Accession No. ML020380691)	02/01/2002
EPRI Report No. 1025144	BWRVIP-86, Revision 1-A: BWR Vessel and Internals Project Updated BWR Integrated Surveillance Program (ISP) Implementation Plan (Proprietary Report, ADAMS Accession Nos. ML13176A098, ML13176A099, ML13176A100, respectively) ¹	Revision 1-A
NRC Safety Evaluation	Final Safety Evaluation Regarding EPRI Technical Report 1016575, BWRVIP-86, Revision 1. (ADAMS Accession Nos. ML112780497 and ML112780503, respectively)	10/20/2011
EPRI Report No. 1024452	BWRVIP-94NP, Revision 2: BWR Vessel and Internals Project Program Implementation Guide	Revision 2-NP
USAR Section 5.3	Reactor Vessel	Rev. 24
Facility License Amendment 136 to Docket No. 50-458	"River Bend Station, Unit 1 – Issuance of Amendment, RE: Reactor Vessel Material Surveillance Program" (ADAMS Accession No. ML032050454)	07/24/2003
EPRI Non-Proprietary Report No. 1021553	"BWRVIP-87NP, Revision 1: BWR Vessel and Internals Project, Testing and Evaluation of BWR Supplemental Surveillance Program Capsules D, G, and H" (ADAMS Accession No. ML102420110)	08/26/2010
EPRI Non-Proprietary Report No. 1021555	"BWRVIP-113: BWR Vessel and Internals Project, River Bend 183 Degree Surveillance Capsule Report" (ADAMS Accession No. ML102580248)	09/13/2010

Document	Description	Revision / Date
EPRI Non-Proprietary Report No. 1021556	"BWRVIP-169: BWR Vessel and Internals Project, Testing and Evaluation of BWR Supplemental Surveillance Program (SSP) Capsules A, B, and C" (ADAMS Accession No. ML102590092)	09/14/2010
EPRI Non-Proprietary Report No. 1021554	"BWRVIP- 111, Revision 1: BWR Vessel and Internals Project, Testing and Evaluation of BWR Supplemental Surveillance Program Capsules E, F, and I" (ADAMS Accession No. ML102720220)	09/24/2010
CR-RBS-2017-04807	Discrepancy found between SAR and TRM and BWRVIP ISP on capsule pull schedule.	June 19, 2017

1. Publically available, non-proprietary version of the BWRVIP-86, Revision 1-A report is given in ADAMS Accession No. ML13176A097.

LRA AMP B.1.38, RG 1.127 Inspection of Water Control Structures Associated with Nuclear Power Plants

Audit Activities. The staff conducted an independent search of the applicant's operating experience database using keywords: "steel," "concrete," "crack," "corrosion," "loosing bolt," and "spall."

No significant plant-specific operating experience associated with the RG 1.127 Inspection of Water Control Structures Associated with Nuclear Power Plants was noted by the staff during its review.

Relevant Documents Reviewed

Document	Description	Revision / Date
CR-RBS-2016-04092	Hairline Cracking on Exterior Concrete Wall	5/31/16
CR-RBS-2014-00516	General steel corrosion on supplementary steel support	2/04/14

LRA AMP B.1.39, Selective Leaching

Audit Activities. The staff conducted an independent search of the applicant’s operating experience database using keywords: “dealloy,” “degraph,” “dezinc,” “leach,” “zinc,” “dealum” “dezinc,” “graphiti,” and “cast iron.”

No significant plant-specific operating experience associated with the Selective Leaching program was noted by the staff during its review.

LRA AMP B.1.40, Service Water Integrity

Audit Activities. The staff conducted an independent search of the applicant’s operating experience database using keywords: “89-13,” “biological,” “coat,” “corros,” “leak,” “loss of material,” “piping,” and “redu.” The table below lists the documents that were identified during the staff’s search of the applicant’s operating experience database and were found relevant to the Service Water Integrity program. The results of the review of relevant operating experience is documented in the AMP Audit Report (ADAMS Accession No. ML17346A732).

Relevant Documents Reviewed

Document	Description	Revision / Date
CR-RBS-2007-05223	Stroking SWP-MOV55A standby cooling tower inlet under flow conditions resulted in approximately 1.2gpm leakby. Subsequent operation of SWP-MOV55A under no flow conditions resulted in essentially 0 leakage	11/23/2007
CR-RBS-2008-01431	SWM-MOV77B supply to Div III EDG is leaking by the passive failure assumptions in USAR Table 9.2.16 in being able to isolate a HPCS EDG jacket cooler are not valid. Post DBA the inventory requirements issue.	02/10/2008
CR-RBS-2008-05043	Sys 103 (Circ Water) Collector pots were filled with broken pieces of cooling tower fill material.	08/22/2008
CR-RBS-2009-04345	CR documents findings of the Stand By Cooling Tower Inspection (SWP-TWR1) for Div 2 performed on 9/23/2009. The overall condition was found to be very good. No structural, mechanical or otherwise functional defect were found. However, the following areas require further action:	09/24/2009

Document	Description	Revision / Date
CR-RBS-2009-04830	This CR is to document the findings of the Stand By Cooling Tower Inspection (SWP-TWR1) for Div 1 performed on 9/30/2009. The inspected areas were below the fans, above the fans, and the area above the fill including the spray header and all associated piping and hardware. The overall condition of the Div 1 side of the tower was found to be very good. No structural, mechanical or otherwise functional defects that could have a negative impact on the operability of the tower were found. However, the following areas require further action:	10/01/2009
CR-RBS-2010-06697	Inaccessible Standby Service Water piping has not been regularly inspected. Portions of the return/riser piping are submerged in the standby cooling tower basin, which significantly increases susceptibility to OD corrosion. Being inaccessible, the GL 89-13 recommendation (Item III) was not recognized as being applicable to this piping.	12/20/2010
CR-RBS-2011-07654	Nonconservative methodology for Standby Cooling Tower Performance and evaporation losses without Drywell Unit Coolers. (From CDBI inspection in 2011)	10/28/2017
CR-RBS-2012-06609	Coating inspection of submerged Standby Cooling Tower piping performed. Minor coating degradation and light rust on some of the inspected piping due to aging. Need to repair or replace the coating to ensure the long-term integrity of the piping.	10/22/2012
CR-RBS-2015-01252	UT exam on pipe SWP-030-028-3 to support installation of 30-inch valves for the Fukushima Project. Min wall for these line is. UT shows 2 places below min wall of 0.164 inch that will require buttering for fit up purposes. (Ref P&ID-09-10E (M-7))	02/25/2015
CR-RBS-2017-02777	Water was observed falling from one location of the tile fill on the east air inlet of the standby cooling tower. Water falling from the tile fill indicates leak by from either the SWP-MOV55A or B valve seats.	03/23/2017

LRA AMP B.1.41, Structures Monitoring

Audit Activities. The staff conducted an independent search of the applicant’s operating experience database using keywords: “concrete,” “steel,” “crack,” “corrosion,” “leak,” “SCC,” “ASR,” “settlement,” “rust,” “coating,” “spall,” “groundwater,” and “leach.”

The table below lists the documents that were reviewed by the staff and were found relevant to the Structures Monitoring Program. These documents were identified in the staff’s search of the applicant’s operating experience database. The results of the review of relevant operating experience is documented in the AMP Audit Report (ADAMS Accession No. ML17346A732).

Relevant Documents Reviewed

Document	Description	Revision / Date
CR-RBS-2008-00581	Structural Conditions Observed in the Turbine Building	01/19/2008
CR-RBS-2009-01005	Deficiencies identified in the G Tunnel	02/20/2009
CR-RBS-2012-01939	Review of NRC IN 2001-20, Concrete Degradation by Alkali-Silica Reaction	03/16/2012
CR-RBS-2014-00516	General steel corrosion identified on supplementary steel support in Control building	02/04/2014
CR-RBS-2014-01367	Grouting at the pedestal of the main plant stack supports	03/20/2014
CR-RBS-2009-06118	Turbine Building Foundation Crack Identified	11/30/2009
CR-RBS-2010-02033	Anchor Bolt not installed per specification requirements	05/05/2010
CR-RBS-2016-04092	Hairline Crack on the exterior concrete wall of the west and south walls of the main control room	05/31/2016

LRA AMP B.1.42, Water Chemistry Control – BWR

Audit Activities. The staff conducted an independent search of the applicant’s operating experience database using keywords: “oxygen,” “hydrogen water chemistry,” “dissolved oxygen,” “and “cracking.”

No significant plant specific operating experience associated with the Water Chemistry Control – BWR program was noted by the staff during its review.

LRA AMP B.1.43 Water Chemistry Control – Closed Treated Water Systems

Audit Activities. The staff conducted an independent search of the applicant’s operating experience database using keywords: “clog,” “cooler,” “corros,” “leak,” “loss of material,” “piping,” and “rust.”

The table below lists the documents that were identified during the staff’s search of the applicant’s operating experience database and were found relevant to the Water Chemistry Control – Closed Treated Water Systems program. The results of the review of relevant operating experience is documented in the AMP Audit Report (ADAMS Accession No. ML17346A732).

Relevant Documents Reviewed

Document	Description	Revision / Date
CR-RBS-2008-00520	SWC Cooling tower cell “B” currently is experiencing a low flow condition due to leakage of the cell inlet isolation valve. The deposits may be adding additional weight and blocking the tight flow channels of the new fill. Visual observation of the past week has shown increase fouling buildup along the fill material.	01/18/2008
CR-RBS-2011-00993	5 of the 6 drains for drywell unit coolers are clogged.	01/23/2011
CR-RBS-2011-01110	SWP-V262 was cut out. Pipe was found to be clogged.	01/25/2011
CR-RBS-2011-02746	The Component Cooling Primary system chemistry has been out of specification since end of RF-16. Chemistry department unsuccessful at restoring parameters using installed demineralizer and feed and bleeds. Contamination of the system is due to its ability to be cross tied with Service Water Primary.	03/08/2011
CR-RBS-2011-03700	SWP-SRT1H (ref P&ID 09-10H) had high dP. Performed blowdown on strainer. Went from 10psid to 9psid.	04/23/2011
CR-RBS-2012-01217	During WO-296978, excessive debris was found in SWP-STR1H (Normal SW Supply to SWP/SWC heat exchanger 1H strainer.) WO was most recent performance of PMID-00010545-01. Frequency of PM is “As Required” SWP-STR1H had not been cleaned since 2000. The PM frequency needs to be updated to prevent excessive clogging. Debris found appears to be mostly rust particles.	02/15/2012

Document	Description	Revision / Date
CR-RBS-2013-02302	The normal SWP system is in service with SWP-P7A & C running and pressure at 129#. The CCP system is in service with CCP-P1A & C running and pressure at 101#. SWP continues to leak into the CCP sys.	03/12/2013
CR-RBS-2013-03728	There is an identified leak from service water into CCP via SWP-MOV504B, RPCCW Loop B System Return (reference CR-2011-6584, WO289456)	05/18/2013
CR-RBS-2013-07048	Valve SWP-V509 EGT-E1B (jacket water /service water cooler) inlet drain valve being clogged.	11/11/2013
CR-RBS-2014-03820	Valve SWP-V3160 drain line upstream is clogged (Ref P&ID-09-10D (B-21))	08/05/2014
CR-RBS-2015-00105	Valve SWP-V871 is clogged, found during testing of SWP-MOV96B (ref P&ID-09-10B (F-20))	01/07/2015
CR-RBS-2015-00871	Valve SWP-V3297 is clogged. (Associated with SWP-MOV501A) (Ref P&ID-09-10D (N-3))	02/11/2015
CR-RBS-2015-01501	Flushing Valve SWP-V3166 is partially clogged (upstream of check valve SWP-V144).	03/02/2015
CR-RBS-2015-03607	Abnormal trend on CCP Component Cooling Primary system indicates makeup occurring twice a day since 5.13.15. Totalizer readings for 3 consecutive days indicate approx. 145 gal, 290 gal, and 440 gal per day respectively.	05/16/2015
CR-RBS-2016-04222	While replacing SWP-RV91B, the inlet piping was discovered to be extremely degraded and corroded. Due to its current condition recommend analyzing for replacement due to the potential of reduced flow. (Ref P&ID-09-10B (J-14))	06/06/2016
CR-RBS-2017-03551	Per SOP-0018 section 5.6, multiple strainer backflushes were performed on SWP-STR1H, SWP-STR1G, and SWP-STR1F with no successful decrease in strainer differential pressure. These strainers are located on the normal service water inlet piping to the Service Water Cooling Heat Exchangers.	04/26/2017

LRA TLLA Section 4.1, Identification of Time-Limited Aging Analyses

Audit Activities. The staff conducted an independent search of the applicant's operating experience database using keywords: "fatigue," "corrosion," "flaw growth," "stability," "pool," "liner," "allowance," "cycles," "40 year," "CUF," "usage factor," and "analysis."

No significant plant-specific operating experience associated with the TLAA Section 4.1, "Identification of Time-Limited Aging Analyses," was noted by the staff during its review.

LRA TLAA Section 4.2.2, Adjusted Reference Temperature

Audit Activities. The staff conducted an independent search of the applicant's operating experience database using keywords: "capsule," "neutron," "flux," "surveillance," "fluence," and "embrittle."

The table below lists the documents that were reviewed by the staff and were found relevant to the TLAA Section 4.2.2. These documents were identified in the staff's search of the applicant's operating experience database. The results of the review of relevant operating experience is documented in the AMP Audit Report (ADAMS Accession No. ML17346A732).

Relevant Documents Reviewed

Document	Description	Revision / Date
CR-RBS-2017-06674	General Electric Hitachi (GEH) identified an error in the neutron fluence model used to calculate RBS license renewal fluence projections.	09/18/2017
CR-RBS-2003-02874	An error was found in tables of a report associated with the reactor vessel fluence analysis.	08/07/2003

LRA TLAA Section 4.2.3, Pressure-Temperature Limits

Audit Activities. The staff conducted an independent search of the applicant's operating experience database using keywords: "capsule," "neutron," "flux," "surveillance," "fluence," and "embrittle."

The table below lists the documents that were reviewed by the staff and were found relevant to the TLAA Section 4.2.3. These documents were identified in the staff's search of the applicant's operating experience database. The results of the review of relevant operating experience is documented in the AMP Audit Report (ADAMS Accession No. ML17346A732).

Relevant Documents Reviewed

Document	Description	Revision / Date
CR-RBS-2017-06674	GEH identified an error in the neutron fluence model used to calculate RBS license renewal fluence projections.	09/18/2017
CR-RBS-2003-02874	An error was found in tables of a report associated with the reactor vessel fluence analysis.	08/07/2003
CR-RBS-2009-04143	GE issued a draft letter on impact to PT Curves due to change in methodology used to evaluate the water level instrumentation nozzle.	09/18/2009
CR-RBS-2017-04807	RBS found outdated information in the SAR and program documents in regards to the reactor vessel surveillance program.	06/17/2017
CR-RBS-2017-07277	This CR a question from the resident inspector on a discrepancy between a plant procedure and the technical specifications	10/12/2017

LRA TLAA Section 4.2.4, Upper Shelf Energy

Audit Activities. The staff conducted an independent search of the applicant’s operating experience database using keywords: “capsule,” “neutron,” “flux,” “surveillance,” “fluence,” and “embrittle.”

The table below lists the documents that were reviewed by the staff and were found relevant to the TLAA Section 4.2.4. These documents were identified in the staff’s search of the applicant’s operating experience database. The results of the review of relevant operating experience is documented in the AMP Audit Report (ADAMS Accession No. ML17346A732).

Relevant Documents Reviewed

Document	Description	Revision / Date
CR-RBS-2017-06674	GEH identified an error in the neutron fluence model used to calculate RBS license renewal fluence projections.	09/18/2017
CR-RBS-2003-02874	An error was found in tables of a report associated with the reactor vessel fluence analysis.	08/07/2003

LRA TLLA Section 4.7.1, Erosion of Main Steam Line Flow Restrictors

Audit Activities. The staff conducted an independent search of the applicant's operating experience database using keywords: "erosion," "analysis," "main steam," and "flow restrictor."

No significant plant-specific operating experience associated with the TLLA Section 4.7.1, "Erosion of Main Steam Line Flow Restrictors," was noted by the staff during its review.

LRA TLLA Section 4.7.2, Postulation of HELB Locations

Audit Activities. The staff conducted an independent search of the applicant's operating experience database using keywords: "HELB," "high energy," "line break," "break," "fatigue," "CUF," "usage factor," and "analysis."

No significant plant-specific operating experience associated with the TLLA Section 4.7.2, "Postulation of HELB Locations," was noted by the staff during its review.

LRA TLLA Section 4.7.3, Fluence Effects for Reactor Vessel Internals

Audit Activities. The staff conducted an independent search of the applicant's operating experience database using keywords: "fluence," "vessel internals," "RVI," "core support," and "analysis."

No significant plant-specific operating experience associated with the TLLA Section 4.7.3, "Fluence Effects for Reactor Vessel Internals," was noted by the staff during its review.

LRA TLLA Section 4.7.4, Crane Load Cycles Analysis

Audit Activities. The staff conducted an independent search of the applicant's operating experience database using keywords: "crane," "fatigue" "cycle," and "vibration."

No significant plant-specific operating experience associated with the TLLA Section 4.7.4, Crane Load Cycles Analysis was noted by the staff during its review.

IV. Final Briefing

A final briefing was held with the applicant on October 27, 2017, to discuss the results of the scoping and screening methodology audit. The audit team identified preliminary areas where additional information would be required to support completion of the staff's LRA review.

VI. NRC Staff

Albert Wong	NRR/DMLR/MRPB
Bill Rogers	NRR/DMLR/MRPB
Angie Buford	NRR/DE/ESEB
Brian Allik	NRR/DMLR/MCCB
Alexander Chereskin	NRR/DMLR/MCCB
Samuel Cuadrado	NRR/DMLR/MCCB
Bart Fu	NRR/DMLR/MPHB
William Gardner	NRR/DMLR/MCCB

James Gavula	NRR/DMLR/MCCB
Dan Hoang	NRR/DE/ESEB
William Holston	NRR/DMLR/MRPB
Alan Huynh	NRR/DMLR/MCCB
Bryce Lehman	NRR/DE/ESEB
Juan Lopez	NRR/DMLR/MRPB
James Medoff	NRR/DMLR/MVIB
Seung Minh	NRR/DMLR/
Arron Mink	NRR/DMLR/
Duc Nguyen	NRR/DE/EENB
Ngola Otto	NRR/DE/EENB
Andrew Prinaris	NRR/DE/ESEB
Mohamad Sadollah	NRR/DE/EENB
George Thomas	NRR/DE/ESEB
Albert Wong	NRR/DMLR/
Mark Yoo	NRR/DMLR/

VII. Applicant Personnel Contacted During Audit

David Lach	Entergy License Renewal Team
Herbert Rideout	Entergy License Renewal Team
Mark Sandusky	Entergy License Renewal Team