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

May 6, 2025

Christopher D. Wilson
Director, License Renewal
Constellation Energy Generation, LLC
200 Energy Way
Kennett Square, PA 19348

SUBJECT: CLINTON POWER STATION, UNIT 1 – REPORT FOR THE AGING MANAGEMENT AUDIT REGARDING THE LICENSE RENEWAL APPLICATION REVIEW

Dear Christopher Wilson:

By letter dated February 14,2024 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML24045A024), as supplemented by letter dated November 27, 2024 (ML24332A050), December 20, 2024 (ML24355A050), January 30, 2025 (ML25030A182), March 25, 2025 (ML25084A044), and April 10, 2025 (ML25100A083), Constellation Energy Generation, LLC (Constellation or CEG) applied for license renewal of Facility Operating License No. NPF-62 for Clinton Power Station (CPS), Unit 1, to the U.S. Nuclear Regulatory Commission (NRC). Constellation submitted its application pursuant to Title 10 of the *Code of Federal Regulations* part 54, "Requirements for Renewal of Operating Licenses for Nuclear Power Plants," for license renewal.

The NRC staff completed its aging management audit from August 12, 2024 – February 11, 2025, in accordance with the audit plan (ML24163A325). The audit report is enclosed.

If you have any questions, please contact me by email at Christopher.Tyree@nrc.gov.

Sincerely,

Signed by Tyree, Christopher
on 05/06/25

Chris S. Tyree, Project Manager
License Renewal Projects Branch
Division of New and Renewed Licenses
Office of Nuclear Reactor Regulation

Docket No. 50-461

Enclosure:
Audit Report
cc w/encl: Listserv

SUBJECT: CLINTON POWER STATION, UNIT 1 – REPORT FOR THE AGING MANAGEMENT AUDIT REGARDING THE LICENSE RENEWAL APPLICATION REVIEW
DATED: MAY 6, 2024

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ADAMS Accession Nos.: ML25090A201 **Via Email** **NRR-106**

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DATE	4/09/2025	04/04/2025	11/04/2024	2/7/2025
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NAME	MYoo	CTyree		
DATE	5/5/2025	5/6/25		

Aging Management Audit

Clinton Power Station, Unit 1
License Renewal Application

August 12, 2024 – February 11, 2025

Division of New and Renewed Licenses
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission

Enclosure

U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR REACTOR REGULATION
DIVISION OF NEW AND RENEWED LICENSES

Docket No:	50-461
License No:	NPF-62
Licensee:	Constellation Energy Generation, LLC
Facility:	Clinton Power Station (CPS), Unit 1
Location:	Rockville, Maryland Clinton, Illinois
Dates:	August 12, 2024 – February 11, 2025
Approved By:	Steven D. Bloom, Chief Corrosion and Steam Generator Branch Division of New and Renewed Licenses
	Angie R. Buford, Chief Vessels and Internals Branch Division of New and Renewed Licenses
	Ian Tseng, Chief Structural, Civil, Geotech Engineering Branch B Division of Engineering and External Hazards
	Mark Yoo, Acting Chief License Renewal Projects Branch Division of New and Renewed Licenses
	Patrick Koch, Acting Chief Long Term Operations and Modernization Branch Division of Engineering and External Hazards
	Darell Murdock, Acting Chief Nuclear Systems Performance Branch Division of Safety Systems
	Matthew A. Mitchell, Chief Piping and Head Penetrations Branch Division of New and Renewed Licenses

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Brian Correll	ELTB/DEX
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George Thomas	ESEB/DEX
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Gregory Makar	NCSG/DNRL
James Gavula	NCSG/DNRL
Joel Jenkins	NCSG/DNRL
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Matthew Yoder	NCSG/DNRL
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Santosh Bhatt	SNSB/DSS
Charley Peabody	SNSB/DSS
Chris Tyree	License Renewal Projects Branch (NLRP)/DNRL
Bill Rogers	NLRP/DNRL

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ACRONYMS AND ABBREVIATIONS

ADAMS	Agencywide Documents Access and Management System
AMP	Aging Management Program
AMR	Aging Management Reviews
ASME	American Society of Mechanical Engineers
BWR	Boiling Water Reactor
BWRVIP	Boiling Water Reactor Vessel and Internals Project Program
CEG	Constellation Energy Generation, LLC
CLB	Current licensing basis
CMTR	Certified material test reports
CPS	Clinton Power Station
CRDRL	Control Rod Drive Return Line
CUF	Cumulative Usage Factor
CWSH	Circulating water screenhouse
DBD	design-basis documents
DBE	Design basis event
DG	Diesel Generator
E&IC	Electrical and instrumentation and control
EAF	Environmentally Assisted Fatigue
EC	Engineering Change
ECCS	Emergency core cooling system
EMI	Electromagnetic interference
EPC	Erosion in Piping and Components
EPRI	Electric Power Research Institute
EQ	Environmental Qualification
ESF	Engineered Safety Features
FE	Further evaluation
FP	Fire protection
FSAR	Final safety analysis report
FW	Feedwater
FWST	Firewater Storage Tank
GALL	Generic Aging Lessons Learned for License
GEH	General Electric Hitachi
HELB	High-Energy Line Break
HSB	High-strength bolting
IPA	Integrated plant assessment
ISI	Inservice inspection
ISP	Integrated surveillance program
LAR	License amendment request
LR	License renewal
LRA	License renewal application
MC	Metal containment
MLC	Check with Lydia crane leak
MWPH	Make-up Water Pump House
NDE	Nondestructive examination

NRC	U.S. Nuclear Regulatory Commission
OBE	Operational basis earthquake
OE	Operating experience
PBD	Program basis document
PCR	Project change request
PM	Preventive maintenance
PMMR	PM Modification Request
QA	Quality assurance
RAI	Requests for additional information
RCI	Requests for confirmation of information
RCIC	Reactor Core Isolation Cooling
RPV	Reactor pressure vessel
RR	Reactor recirculation
RT_{NDT}	nil-ductility reference temperature
RVI	Reactor vessel internal
RWCU	Reactor Water Cleanup
SBO	Station blackout
SC	Structures and the components
SCC	Reactor Water Cleanup
SE	Safety Evaluation
SPD	Single phase detection
SR	Safety-related
SRM	Source range monitor
SRP	standard review plan
SRV	Safety relief valve
SSC	Systems, structures, and components
SSE	Safe shutdown earthquake
TLAA	Time-Limited Aging Analysis
UAT	Unit auxiliary transformer
USAR	Updated Safety Analysis Report
USE	Upper-shelf energy
UT	Ultrasonic Testing
WO	Work order

Report for the Aging Management Audit
Clinton Power Station, Unit 1
License Renewal Application

1. Introduction

The U.S. Nuclear Regulatory Commission (NRC) staff conducted an aging management audit of Constellation Energy Generation, LLC (Constellation, CEG or applicant) of (1) plant-specific operating experience (OE); (2) methodology to identify the systems, structures, and components (SSCs) to be included within the scope of license renewal (LR) and subject to an aging management review (AMR) (Scoping and Screening Portion); and (3) aging management programs (AMPs), AMR items, Time-Limited Aging Analyses (TLAAs), and associated bases and documentation as applicable (AMP and TLAA Portion) for the license renewal (LR) of Facility Operating License No. NPF-62 for Clinton Power Station (CPS), Unit 1.

The purpose of the plant-specific OE portion of the audit is to identify examples of age-related degradation, as documented in the applicant's corrective action program database, and to provide a basis for the staff's conclusions on the ability of the applicant's proposed AMPs to manage the effects of aging in the period of extended operation. Constellation searched their OE database and provided the results for the associated AMPs and TLAAs for NRC staff review.

The purpose of the Scoping and Screening portion of the audit is to evaluate the scoping and screening process as documented in the LR application, implementing procedures, reports, and drawings, such that the NRC staff:

- obtain an understanding of the process used to identify the SSCs within the scope of LR and to identify the structures and components subject to an AMR

- have sufficient docketed information to allow the staff to reach a conclusion on the adequacy of the scoping and screening methodology as documented and applied

The purpose of the AMP and TLAA Portion of the audit is to:

- examine Constellation's AMPs, AMR items, and TLAAs for CPS

- verify Constellation's claims of consistency with the corresponding NUREG-1801, *Generic Aging Lessons Learned for License Renewal (GALL) Report*, (GALL-LR Report) issued in December 2010, AMPs, and AMR items

- assess the adequacy of the TLAAs

Enhancements and exceptions will be evaluated on a case-by-case basis. The NRC staff's review of enhancements and exceptions will be documented in the safety evaluation (SE).

The regulatory basis for the audit was Title 10 of the *Code of Federal Regulations (*10 CFR) Part 54, "Requirements for Renewal of Operating Licenses for Nuclear Power Plants." The NRC staff also considered the guidance contained in NUREG-1800, *Standard Review Plan for Review of License Renewal Applications for Nuclear Power Plants* (SRP-LR), dated December 2010, and NUREG-1801. The SRP-LR allows an applicant to reference in its license renewal

application (LRA) the AMPs described in the GALL-LR Report. By referencing the GALL-LR Report AMPs, the applicant concludes that its AMPs correspond to those AMPs reviewed and approved in the GALL-LR Report and that no further NRC staff review is required. If an applicant credits an AMP for being consistent with a GALL-LR Report program, it is incumbent on the applicant to make sure the plant program contains all elements of the referenced GALL-LR Report program. The applicant should document this determination in an auditable form and maintain the documentation on-site.

2. Audit Activities

A regulatory audit is a planned, license-related activity that includes the examination and evaluation of primarily non-docketed information. A regulatory audit is conducted with the intent to gain greater understanding of an application, to verify information and, if applicable, to identify information that will require docketing to support the staff's conclusions that form the basis of the licensing or regulatory decision.

The LRA states that every AMP in the LRA is consistent with the program elements of the GALL-LR Report. To verify this claim of consistency, the staff audited each AMP, including any enhancements or exceptions associated with an AMP.

The LRA discusses each TLAA, the disposition of the TLAA in accordance with 10 CFR 54.21(c)(1), and the basis for that disposition. To verify that the applicant provided a basis to support its disposition of the TLAA, the staff audited each TLAA.

The staff also audited AMR items not associated with an AMP to determine if the information in the LRA is consistent with the further evaluation (FE) information in the SRP-LR.

Furthermore, the staff audited the final safety analysis report (FSAR) descriptions for each AMP and TLAA for consistency with the SRP-LR. During its audit, the staff interviewed the applicant's staff and reviewed documentation contained in the LRA and provided by the applicant via the ePortal.

For the OE review, the applicant made a presentation on the process used to identify and evaluate the pertinent OE. Afterwards, the staff conducted its review of the applicant's methodology and OE by reviewing documentation contained in the LRA and ePortal.

Licensing conclusions or staff findings are not made in the audit reports since licensing and regulatory decisions cannot be made solely based on an audit. Therefore, items identified but not resolved within the scope of the audit will be followed using other NRC processes, such as requests for additional information (RAIs), requests for confirmation of information (RCIs), and public meetings. Licensing conclusions, staff findings, staff review of enhancement and exceptions, and resolution of audit items will be documented in the staff's SE.

The following sections discuss the LRA areas reviewed by the staff.

LRA Section 2.1, Scoping and Screening Methodology

Summary of Information in the Application

LRA Section 2.1, "Scoping and Screening Methodology," describes the process for identifying and determining the CPS SSCs that are included within the scope of license renewal (LR).

10 CFR 54.21, “Contents of Application – Technical Information,” requires that each application for LR contain an integrated plant assessment (IPA), which lists, for SSCs within the scope of LR, the structures and the components (SCs) that are subject to an AMR. Section 10 CFR 54.4(a), “Scope,” provides the criteria for inclusion of SSCs within the scope of LR and 10 CFR 54.21(a)(1) requires that SCs within the scope of license renewal, that are determined to be passive and not periodically replaced (long-lived), are subject to an AMR. The staff conducted an on-site scoping and screening methodology audit, from September 4-5, 2024, to review the scoping and screening methodology, administrative controls governing implementation of the methodology, and the scoping and screening results for selected plant SSCs.

Audit Activities

A. Scoping Methodology

Staff Review of Information Sources, Implementing Documents and Scoping Methodology

The staff reviewed the methodology used by the applicant to identify mechanical, structural, and electrical SSCs within the scope of LR (scoping). In addition, the staff reviewed documentation pertinent to the scoping process. The staff assessed whether the scoping methodology outlined in the LRA and implementing procedures was consistent with the requirements of 10 CFR Part 54.

The staff determined that the applicant’s LR project personnel performed the scoping activities, in accordance with the applicable implementing documents.

The staff confirmed that the applicant’s detailed LR program guidelines specified the use of the current licensing basis (CLB) source information in developing scoping evaluations. The staff reviewed pertinent information sources used by the applicant including the component database, the FSAR, design-basis documents (DBD), LR drawings and station drawings.

The staff discussed the applicant’s administrative controls for the component database and the other information sources used to verify system information. These controls are described and implemented by plant procedures. Based on a review of the administrative controls and on a sample of the system classification information contained in the applicable documentation, the staff determined that the applicant has established adequate measures to control the integrity and reliability of system identification and safety classification data; therefore, the staff determined that the information sources used by the applicant during the scoping and screening process provided a controlled source of system and component data to support scoping and screening evaluations.

The staff reviewed the implementing procedures and results reports used to support identification of SSCs that the applicant relied on to demonstrate compliance with the requirements of 10 CFR 54.4(a). The applicant’s LR program guidelines provided a listing of documents used to support scoping evaluations. The staff determined that the design documentation sources, required to be used by the applicant’s implementing procedures, provided sufficient information to ensure that the applicant identified SSCs to be included within the scope of LR consistent with the plant’s CLB.

During the audit, the applicant stated that it evaluated the types of events listed in Nuclear Energy Institute (NEI) 95-10 (anticipated operational occurrences, design-basis accidents,

external events, and natural phenomena) that were applicable to CPS. The staff reviewed the applicant's basis documents, which described design-basis conditions in the CLB, and addressed events defined by 10 CFR 50.49(b)(1) and 10 CFR 54.4(a)(1). The FSAR and basis documents discussed events, such as internal and external flooding, tornados, and missiles. The staff determined that the applicant's evaluation of DBEs was consistent with the SRP-LR.

The staff determined that the applicant's LR project personnel performed the scoping activities, in accordance with the applicable implementing documents, as follows:

- Mechanical scoping: The applicant used information contained in the plant component database to develop a list of plant systems and used CLB information, DBD, maintenance rule basis documents, and station drawings to identify system intended functions. The intended functions were evaluated using the criteria of 10 CFR 54.4(a) to identify those systems to be included within the scope of LR.

- Structural scoping: The applicant used CLB information, DBD, and station drawings to develop a structures list and to identify structural intended functions. The intended functions were evaluated using the criteria of 10 CFR 54.4(a) to identify those systems to be included within the scope of LR.

- Electrical scoping: the applicant used a bounding approach for plant electrical and instrumentation and control (E&IC) systems and initially included all E&IC systems, and E&IC components contained in mechanical systems, within the scope of LR by default.

B. Screening Methodology

The staff reviewed the methodology used by the applicant to determine if mechanical, structural, and electrical SCs within the scope of LR would be subject to an AMR (screening) and the applicant provided a discussion indicating the processes used for each discipline.

The staff determined that the applicant's LR project personnel performed the screening activities, in accordance with the applicable implementing documents, as follows:

- Mechanical components were subject to AMR if they met the criteria of being passive and long-lived and the components supported a system intended function, which required the system to be included within the scope of LR. The applicant had identified the component level intended functions (e.g., pressure boundary, heat transfer), which supported a system intended function and highlighted the in-scope components that were subject to AMR on the LR drawings. Mechanical components that were included within scope in accordance with 10 CFR 54.4(a)(2) and subject to AMR were also identified on the LR drawings.

- Structural components that support intended functions (e.g., support, enclosure protection, fire barrier, flood barrier, pressure boundary) are included in the scope of LR. Structural drawings are reviewed to identify passive, long-lived SCs.

- Electrical and instrumentation and control components, which were included within the scope of renewal in accordance with the bounding method used for E&IC, were evaluated in accordance with the guidance contained in NEI 95-10 to identify the passive and long-lived components subject to AMR.

The staff noted that the applicant's screening process was performed in accordance with its written requirements and was consistent with the guidance provided in the SRP-LR and NEI 95-10. The staff determined that the screening methodology was consistent with the requirements of 10 CFR Part 54 for the identification of SSCs that meet the screening criteria of 10 CFR 54.21(a)(1).

C. Staff Verification of Scoping and Screening Results for Sampled Systems and Components

The staff performed a sampling review of the results of the applicant's implementation of the scoping and screening methodology to confirm that the results were in conformance with the applicable implementing documents and the requirements of 10 CFR Part 54.

The staff reviewed a sample of the scoping and screening implementation and performed walkdowns for portions of plant drainage system. The staff reviewed applicable portions of the FSAR, scoping and screening reports, and LR drawings and performed walkdowns to confirm information contained in the LRA.

D. Aging Management Program Quality Assurance Attributes

The staff reviewed the AMP quality assurance (QA) elements to verify consistency with the staff's guidance described in SRP-LR, Appendix A, "Branch Technical Positions," Section A.2, "Quality Assurance for Aging Management Programs (Branch Technical Position IQMB-1)." The AMP QA elements are corrective action, confirmation process, and administrative controls.

The applicant described the AMP QA elements in LRA Appendix A, "Updated Final Safety Analysis Report Supplement," Section A.1, "Summary Descriptions of Aging Management Programs and Activities," and LRA Appendix B, "Aging Management Programs," Section B.1.3, "Quality Assurance Program and Administrative Controls," and the individual AMPs.

LRA Section Appendix A.1.5 stated that the QA Program for CPS implements the requirements of 10 CFR Part 50, Appendix B, and will be consistent with the summary in Appendix A.2, "Quality Assurance for Aging Management Programs (Branch Technical Position IQMB-1)," of NUREG-1800. The QA Program includes the elements of corrective action, confirmation process, and administrative controls, and is applicable to nuclear safety-related SSCs. CPS will enhance the QA Program to include nonnuclear safety (NNS) SSCs that are subject to AMR for LR.

LRA Section Appendix B.1.3 also stated that the CPS QA Program implements the requirements of 10 CFR Part 50, Appendix B, "Quality Assurance Requirements for Nuclear Power Plants and Fuel Reprocessing Plants" and is consistent with the summary in Appendix A.2 of NUREG-1800. The CPS QA Program includes the elements of corrective action, confirmation process, and administrative controls, and is applicable to nuclear safety-related SSCs and nonsafety-related SSCs that are subject to AMR for LR.

Based on the staff's evaluation, review of the AMPs and information contained in LRA Sections Appendix A.1 and Appendix B.1.3, the staff determined that the AMP QA elements are consistent with the staff's position regarding QA for aging management.

Documents Reviewed

The documents table below list documents that were reviewed by the staff and were found relevant. The staff will document its review of this information in the SE.

Document	Title	Revision / Date
CL-SSBD-A1	10CFR 54.4(a)(1) Safety-Related Systems Scoping and Screening Basis Document	Rev. 3
CL-SSBD-A2	10CFR 54.4(a)(2) Safety-Related Systems Scoping and Screening Basis Document	Rev. 0
CL-SSBD-AOT	Abnormal Operational Transients Scoping and Screening Basis Document	Rev. 1
CL-SSBD-ATWS	10CFR 54.4(a)(3) ATWS Systems Scoping and Screening Basis Document	Rev. 1
CL-SSBD-EQ	10CFR 54.4(a)(3) Environmental Qualification Systems Scoping and Screening Basis Document	Rev. 4
CL-SSBD-FP	10CFR 54.4(a)(3) Fire Protection Scoping and Screening Basis Document	Rev. 4
CL-SSBD-SBO	10CFR 54.4(a)(3) Station Blackout Systems Scoping and Screening Basis Document	Rev. 3
CL-SSBD-SCRN	Structures, Component, and Commodity Types, with Active, Passive Determinations, and Intended Functions	Rev. 1
CL-SSBD-SSL	License Renewal Systems and Structures Scoping and Screening Basis Document	Rev. 3
CL-SSBD-TBA2	Evaluation of Safety-Related Components Located in Nonsafety-Related Structures Scoping and Screening Basis Document	Rev. 1

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

Summary of Information in the Application

LRA Section B.2.1.1 states that the ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD Program is an existing program that is consistent with the program elements in GALL-LR Report AMP XI.M1, “ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD Program.” To verify this claim of consistency, the staff audited the LRA AMP.

Audit Activities

During its audit, the staff interviewed the applicant’s staff, and reviewed documentation contained in the LRA and provided by the applicant via the ePortal. For the operating experience (OE) review, the applicant provided a presentation on the process used to identify and evaluate the pertinent OE. Afterwards, the staff conducted its review of the applicant’s methodology and reviewed the OE by reviewing the documentation contained in the LRA and ePortal.

The table below lists documents that were reviewed by the staff and were found relevant to the program. The staff will document its review of this information in the SE.

Document	Title	Revision / Date
CL-PBD-AMP-XI.M1	Clinton Power Station, Unit 1 License Renewal Project ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD Program Basis Document	Rev. 1 02/06/2024
ER-CL-330-1001	Clinton Power Station Unit 1, ISI Program Plan, Fourth Ten-Year Inspection Interval (Constellation Proprietary)	Rev. 0 03/25/2020
C1R17-APR-02	GE Hitachi UT Examination Summary Sheet, Nozzle-to-Safe End N1B-W-1	05/23/2017
AR04012873	UT Indication in N1B-W-1	05/19/2017
CC-AA-309-1001	SIA-1700454.301 Recirculation Loop Weld N1B-W-1 Flaw Evaluation – 2017 (Constellation Proprietary)	Rev. 9 05/25/2017

During the audit, the staff verified applicant's claim that the "scope of program," "preventive actions," "parameters monitored or inspected," "detection of aging effects," "monitoring and trending," "acceptance criteria," and "corrective actions" program elements of the LRA AMP are consistent with the corresponding program elements in the GALL-LR Report AMP. The staff also audited the description of the LRA AMP provided in the FSAR Supplement. The staff verified that this description is consistent with the description provided in the SRP-LR.

LRA AMP B.2.1.2, Water Chemistry

Summary of Information in the Application

The LRA states that AMP B.2.1.2, "Water Chemistry," is an existing program with one exception that is consistent with the program elements in GALL-LR Report AMP XI.M2, "Water Chemistry." To verify this claim of consistency, the staff audited the LRA AMP. During the audit, the staff also reviewed the exception associated with this AMP. The staff will document its review of the exception to the GALL-LR Report AMP in the SE.

Audit Activities

The table below lists documents that were reviewed by the staff and were found relevant to the program. The staff will document its review of this information in the SE.

Document	Title	Revision / Date
CL-PBD-AMP-XI.M2	Clinton Power Station, Unit 1 License Renewal Project Water Chemistry	Rev. 1
AR 04057349	System Dissolved Oxygen is Higher than Expected	09/29/2017
AR 04192481	Reactor Water Chlorides Above Action Level 1 AL-1 Post C1M23	11/7/2018

Document	Title	Revision / Date
PI-AA-126-1001-F-01	Condensate Chemistry Self-Assessment (Constellation Proprietary)	Rev. 2
PI-AA-125-1001	4010.02, Chemistry Off-Normal entered (Sulfates > AL1) (Constellation Proprietary)	11/10/2022
CY-AB-120-0001	Chemistry Action Level Impact Assessments, Engineering Evaluations and Cleanup Projections (Constellation Proprietary)	Rev. 3
CY-AB-120-1000	BWR Strategic Water Chemistry Plan (Constellation Proprietary)	Rev. 15
CY-AB-120-1000-F-02	Clinton Strategic Water Chemistry Plan Appendix (Constellation Proprietary)	Rev. 6
CY-AB-120-100	Reactor Water Chemistry (Constellation Proprietary)	Rev. 21
CY-AB-120-110	Condensate and Feedwater Chemistry (Constellation Proprietary)	Rev. 28
CY-AB-120-200	Storage Tanks Chemistry (Constellation Proprietary)	Rev. 15
CY-AB-120-300	Spent Fuel Pool (Constellation Proprietary)	Rev. 20
CY-AB-120-310	Suppression Pool/Torus Chemistry (Constellation Proprietary)	Rev. 12
CY-AB-120-320	Control Rod Drive Water Chemistry (Constellation Proprietary)	Rev. 10
CY-AB-120-1100	Reactor Water Hydrogen Water Chemistry, Noble Chem and Zinc Injection (Constellation Proprietary)	Rev. 17
WO 04685556	Level Transient on MSDT 1A During Downpower	05/15/2018
EPRI-3002002623	BWRVIP-190: BWR Vessel and Internals Project: BWR Water Chemistry Guidelines (Constellation Proprietary)	Rev. 1
N/A	2019 BWR Water Chemistry Guidelines Interim Guidance (Constellation Proprietary)	March 2019
EC 637343	Install Condensate Polishing Pre-Filters G, H and J	Rev. 000
AR 04488488	FW Iron in Action Level 1 Greater than 96 Hours	03/30/2022
AR 04727170	Cycle 21 Feedwater Iron Above Cycle Average Goal	12/29/2023
LR-CPS-M05-1077 Sh.1	P&ID Standby Liquid Control (SC) Clinton Power Station Unit 1 Clinton, Illinois	Rev. A

During the audit, the staff verified the applicant's claim that the "preventive actions," "parameters monitored or inspected," "detection of aging effects," "monitoring and trending," "acceptance criteria," and "corrective actions" program elements of the LRA AMP are consistent with the corresponding elements of the GALL-LR Report AMP.

The staff also verified the applicant's claim that aspects of the "scope of program," program element not associated with the exception identified in the LRA during the audit are consistent with the corresponding program elements in the GALL-LR Report AMP.

The staff also audited the description of the Water Chemistry program provided in the FSAR supplement. The staff verified this description is consistent with the description provided in the SRP-LR.

LRA AMP B.2.1.3, Reactor Head Closure Stud Bolting Program

Summary of Information in the Application

The LRA states that AMP B.2.1.3, "Reactor Head Closure Stud Bolting Program," is an existing program that is consistent with the program elements in GALL-LR Report AMP XI.M3, "Reactor Head Closure Stud Bolting."

Audit Activities

During its audit, the staff interviewed the applicant's staff and reviewed documentation contained in the LRA and provided by the applicant via the ePortal.

For the operating experience (OE) review, the staff conducted its review of the applicant's methodology and operating experience by reviewing documentation contained in the LRA and ePortal.

The table below lists documents that were reviewed by the staff and were found relevant to the program. The staff will document its review of this information in the SE.

Document	Title	Revision / Date
CL-PBD-AMP-XI.M3	Reactor Head Closure Stud Bolting Program Basis Document	Rev. 3
GE 007N8539	Clinton Unit 1 License Renewal Top Head Closure CMTR Data Review (GE Hitachi Proprietary)	Rev. 0, 7/2023
N/A	Purchase Order 00494962	Rev. 4
N/A	Certification for Purchase Order 00494962	10/12/2013
N/A	Inservice Inspection Summary Report – C1R13	03/21/2012
N/A	Inservice Inspection Summary Report – C1R17	08/25/2017
N/A	Inservice Inspection Summary Report – C1R19	01/14/2020
ER-CL-330-001	Clinton Power Station Unit 1 ISI Program Plan Fourth Ten-Year Inspection Interval (Constellation Proprietary)	Rev. 0
ER-AA-335-047	NonDestructive Examination (NDE) Procedure and Personnel Certification Review and Approval (Constellation Proprietary)	Rev. 8
ER-AA-330-009	ASME Section XI Repair/Replacement Program (Constellation Proprietary)	Rev. 18

Document	Title	Revision / Date
ML20255A211	Safety Evaluation by the Office of Nuclear Reactor Regulation Alternative Request I4R-07 Regarding Volumetric Examination of Reactor Pressure Vessel Threads in Flange	09/11/2020

During the audit, the staff verified the applicant's claim that the "scope of program," "preventative actions," "parameters monitored or inspected," "detection of aging effects," "monitoring and trending," "acceptance criteria," and "corrective actions" program elements of the LRA AMP are consistent with the corresponding elements of the GALL-LR Report AMP.

During the audit, the staff made the following observations:

- The staff verified that the CPS reactor pressure vessel closure studs, nuts and washers are SA 540 Grade B24 and that the stud assemblies have a specified minimum yield strength of 130 ksi and a maximum ultimate tensile strength of 170 ksi (GE Report 007N8538).

- The applicant stated the repair and replacement of reactor head closure stud material assures that any studs procured have measured yield strength of less than 150 ksi (ER-AA-330-009). The staff noted that CPS replaced a reactor head closure stud in 2013 and that the stud had a measured yield strength of less than 150 ksi.

- The staff verified the Code of Record for CPS is the 2013 Edition, no Addenda of ASME Boiler & Pressure Vessel Section XI and that CPS is in the 4th in-service inspection interval with beginning and ending dates of July 1st, 2020, and June 30th, 2030, respectively.

- The staff verified in the examination results of the most recent ASME Code Section XI in-service inspection summary reports, listed in the table above, that there were no unacceptable indications for any reactor head closure studs, threads in flange, nuts, or washers.

- The staff confirmed the CPS closure stud holes (i.e., flange threads) do not have the bushing design (CL-PBD-AMP-XI.M3).

- The staff verified that a phosphate coating was applied to threaded areas of the studs, nuts, and bearing areas of the nuts and washers to act as a rust inhibitor and to assist in retaining lubricant on these surfaces.

The staff also audited the description of the Reactor Head Closure Stud Bolting Program provided in the FSAR supplement. The staff verified this description is consistent with the description provided in the SRP-LR Report.

LRA AMP B.2.1.4, BWR Vessel ID Attachment Welds

Summary of Information in the Application

The LRA states that AMP B.2.1.4, "BWR Vessel ID Attachment Welds," is an existing program that is consistent with the program elements in GALL-LR Report AMP XI.M4, "BWR Vessel ID Attachment Welds."

Audit Activities

In addition to the OE documentation contained in the LRA and ePortal, the staff observed the applicant's search of its operating experience database using the keyword: ("cracking", "stress corrosion").

The table below lists documents that were reviewed by the staff and were found relevant to the program. The staff will document its review of this information in the SE.

Document	Title	Revision / Date
CL-PBD-AMP-XI.M4	Program Basis Document - "BWR Vessel ID Attachment Welds"	Rev. 1
EC619862	Evaluation of In Vessel Visual Inspection Notification Reports C1R17	05/2017
	Clinton Power Station – ISI IN VESSEL INSPECTION PROGRAM	07/25/ 2022
ER-AB-331-1001	Boiling Water Reactor (BWR) Internals Program (Constellation Proprietary)	Rev. 10

During the audit, the staff verified the applicant's claim that the "scope of program," "preventive actions," "parameters monitored or inspected," "detection of aging effects," "monitoring and trending," "acceptance criteria," and "corrective actions" program element(s) of the LRA AMP is consistent with the corresponding elements of the GALL-LR Report AMP.

During the audit, the staff made the following observations:

- The staff noted that LRA Section B.2.1.4 indicated that the AMP substitutes the inspection and evaluation recommendations within BWRVIP-48-A for the requirements within ASME Code, Section XI. However, LRA Section A.2.1.4 describes the AMP as including the inspection and evaluation recommendations within BWRVIP-48-A and requirements within ASME Code, Section XI. The staff will consider issuing an RAI in order to obtain the information necessary to address the inconsistency between LRA Section B.2.1.4 and LRA Section A.2.1.4 and whether the AMP will be adequate to manage the effects of aging of the reactor vessel attachment welds.

The staff also audited the description of the LRA AMP provided in the FSAR supplement. As described above, the staff noted a discrepancy in the description of the AMP and whether the AMP will be adequate to manage the effects of aging of the reactor vessel attachment welds.

The staff will consider issuing an RAI in order to obtain the information necessary to verify the sufficiency of the FSAR supplement program description.

LRA AMP B.2.1.5, BWR Feedwater Nozzle

Summary of Information in the Application

The LRA states that AMP B.2.1.5, "BWR Feedwater Nozzle," is an existing program that is consistent with the program elements in GALL-LR Report AMP XI.M5, "BWR Feedwater Nozzle."

Audit Activities

In addition to the OE documentation contained in the LRA and ePortal, the staff observed the applicant's search of its operating experience database using the keyword: ("cracking").

The table below lists documents that were reviewed by the staff and were found relevant to the program. The staff will document its review of this information in the SE.

Document	Title	Revision / Date
CL-PBD-AMP-XI.M5	Program Basis Document - "BWR Feedwater Nozzle"	Rev. 1
	Updated Safety Analysis Report – Section 5.2 and 5.3	Rev. 21
	GE Hitachi Examination Summary Sheet – C1R20 – ASME Item B3.90 – Nozzle to Shell (N4 Nozzle)	10/2021
NUREG-0619	BWR Feedwater Nozzle and Control Rod Drive Return Line Nozzle Cracking: Resolution of Generic Technical Activity A-10 (Technical Report)	Rev. 1

During the audit, the staff verified the applicant's claim that the "scope of program," "preventive actions," "parameters monitored or inspected," "detection of aging effects," "monitoring and trending," "acceptance criteria," and "corrective actions" program element(s) of the LRA AMP is consistent with the corresponding elements of the GALL-LR Report AMP.

The staff also audited the description of the LRA AMP provided in the FSAR supplement. The staff verified this description is consistent with the description provided in the SRP-LR.

LRA AMP B.2.1.6, BWR Control Rod Drive Return Line (CRDRL) Nozzle

Summary of Information in the Application

The LRA states that AMP B.2.1.6, "BWR Control Rod Drive Return Line (CRDRL) Nozzle," is an existing program that is consistent with the program elements in GALL-LR Report AMP XI.M6, "BWR Control Rod Drive Return Line (CRDRL) Nozzle."

Audit Activities

In addition to the OE documentation contained in the LRA and ePortal, the staff observed the applicant's search of its operating experience database using the keyword: ("cracking").

The table below lists documents that were reviewed by the staff and were found relevant to the program. The staff will document its review of this information in the SE.

Document	Title	Revision / Date
CL-PBD-AMP-XI.M6	Program Basis Document - “BWR Control Rod Drive Return Line Nozzle”	Rev. 1
	Updated Safety Analysis Report – Section 5.2 and 5.3	Rev. 21
	GE Hitachi Examination Summary Sheet – C1R19 – ASME Item B3.90 – Nozzle to Shell – N10 Nozzle	09/2019
NUREG-0619	BWR Feedwater Nozzle and Control Rod Drive Return Line Nozzle Cracking: Resolution of Generic Technical Activity A-10 (Technical Report)	Rev. 1

During the audit, the staff verified the applicant’s claim that the “scope of program,” “preventive actions,” “parameters monitored or inspected,” “detection of aging effects,” “monitoring and trending,” “acceptance criteria,” and “corrective actions” program element(s) of the LRA AMP is consistent with the corresponding elements of the GALL-LR Report AMP.

The staff also audited the description of the LRA AMP provided in the FSAR supplement. The staff verified this description is consistent with the description provided in the SRP-LR.

LRA AMP B.2.1.7, BWR Stress Corrosion Cracking Program

Summary of Information in the Application

The LRA states that AMP B.2.1.7, “BWR Stress Corrosion Cracking” is an existing condition monitoring and mitigative program that is consistent with the program elements in GALL-LR Report AMP XI.M7, “BWR Stress Corrosion Cracking.” To verify this claim of consistency, the staff audited the LRA AMP.

Audit Activities

During its audit, the staff interviewed the applicant’s staff, and reviewed documentation contained in the LRA and provided by the applicant via the ePortal.

For the operating experience (OE) review, the applicant provided a presentation on the process used to identify and evaluate the pertinent OE. Afterwards, the staff conducted its review of the applicant’s methodology and evaluated the OE by reviewing the documentation contained in the LRA and ePortal.

The table below lists documents that were reviewed by the staff and were found relevant to the program. The staff will document its review of this information in the SE.

Document	Title	Revision / Date
CL-PBD-AMP-XI.M7	Clinton Power Station Unit 1, License Renewal Project: BWR Stress Corrosion Cracking Program	Rev. 1 02/06/2024

Document	Title	Revision / Date
ER-AA-330	Conduct of Inservice Inspection Activities (Constellation Proprietary)	Rev. 19
AR 04012873	UT Indication in N1B-W1	05/19/2017
ER-AB-331-1001	Exelon Generation, Boiling Water Reactor (BWR) Internals Program (Constellation Proprietary)	Rev. 10
CL-C1R20-ISI Summary Report	Clinton Power Station Unit 1, Post Outage 90-Day Inservice Inspection (ISI) Summary Report – Jan 2022 Inspection Results	Rev. 0 01/2022

During the audit, the staff verified applicant's claim that portions of the "scope of program," "preventive actions," "parameters monitored or inspected," "detection of aging effects," "monitoring and trending," "acceptance criteria," and "corrective actions" program elements of the LRA AMP are consistent with the corresponding elements of the GALL-LR Report AMP.

The staff also audited the description of the LRA AMP provided in the FSAR Supplement. The staff verified that this description is consistent with the description provided in the SRP-LR Report.

LRA AMP B.2.1.8, BWR Penetrations

Summary of Information in the Application

The LRA states that AMP B.2.1.8, "BWR Penetrations," is an existing program that is consistent with the program elements in GALL-LR Report AMP XI.M8, "BWR Penetrations." To verify this claim of consistency, the staff audited the LRA AMP.

Audit Activities

During its audit, the staff interviewed the applicant's staff and reviewed documentation contained in the LRA and provided by the applicant via the ePortal. For the operating experience (OE) review, the applicant made a presentation on the process used to identify and evaluate the pertinent OE. The staff conducted its review of the applicant's methodology and OE by reviewing documentation contained in the LRA and ePortal. The table below lists documents that were reviewed by the staff and were found relevant to the program. The staff will document its review of this information in the SE.

Document	Title	Revision / Date
CL-PBD-AMP-XI.M8	Program Basis Document – BWR Penetrations	Rev. 1 / 07/17/2023
N/A	In-Vessel Inspection (IVI) Program Plan	Rev. 10 / 07/25/2022

During the audit, the staff verified applicant's claim that the "scope of program," "preventive actions," "parameters monitored or inspected," "detection of aging effects," "monitoring and trending," "acceptance criteria," and "corrective actions" program elements of LRA AMP are consistent with the corresponding elements of the GALL-LR Report AMP.

The staff also audited the description of the LRA BWR Penetrations provided in the FSAR supplement. The staff verified this description is consistent with the description provided in the GALL-LR Report.

LRA AMP B.2.1.9, BWR Vessel Internals, and SLRA TLAA Section 4.2.11, Top Guide IASCC Analysis

Summary of Information in the Application

The LRA states that AMP B.2.1.9, "BWR Vessel Internals," is an existing program that is consistent with the program elements in GALL-LR Report AMP XI.M9, "BWR Vessel Internals." SLRA section 4.2.11 "Top Guide IASCC Analysis," discusses the fluence projections on the RPV top guide and the applicant dispositioned the TLAA in accordance with 10 CFR 54.21(c)(1)(iii).

Audit Activities

The table below lists documents that were reviewed by the staff and were found relevant to the program. The staff will document its review of this information in the SE.

Document	Title	Revision / Date
CL-PBD-AMP-XI.M9	Program Basis Document – BWR Vessel Internals	Rev.1
IR 4284830	In Vessel Inspection Results and Disposition	
IR 201906	Steam Dryer Support Brackets As-Found Condition	
N/A	Clinton Power Station In-Vessel Inspection Program Plan	Rev. 10
EPRI Letter 2021-030	Potential Non-Conservatism in EPRI Report, BWRVIP-100 Rev. 1-A, 3002008388 and Impacted BWRVIP Reports	03/22/2021
IR 1299448	Relevant Indication on Core Shroud Weld V11	12/08/2011
IR 4406225	EPRI BWRVIP-235 DLL Potential Non-Conservatism	03/03/2021
IR 4410934	BWRVIP-235 and Other Impacted EPRI Docs	03/23/2021
EC 634131	Potential Part 21 for BWRVIP-235 & Other Core Shroud Documents	04/29/2021
EC 386910	Evaluation of GE INR's C1R13	Rev. 0
EPRI Letter 2021-028	Status Update on Potential Non-Conservatism in EPRI Report, BWRVIP-100 Rev. 1-A, 3002008388 and EPRI Software, BWRVIP-235, 1018251 (appended to BWRVIP-76, Revision 1-A) (EPRI Proprietary)	03/19/2021

During the audit, the staff verified the applicant's claim that the "scope of program," "preventive actions," "parameters monitored or inspected," "detection of aging effects," "monitoring and

trending," "acceptance criteria", and "corrective actions" program elements of the LRA AMP are consistent with the corresponding elements of the GALL-LR Report AMP.

During the audit, the staff made the following observations:

- The staff reviewed the applicant's response to EPRI Letter 2021-030.
- The staff reviewed the applicant's disposition of a flaw in core shroud weld V11 and reevaluation as a result of EPRI Letter 2021-030.

LRA AMP B.2.1.10, Flow-Accelerated Corrosion

Summary of Information in the Application

The LRA states that AMP B.2.1.10, "Flow-Accelerated Corrosion," is an existing program that, with an exception, is consistent with the program elements in GALL-LR Report AMP XI.M17, "Flow-Accelerated Corrosion," as modified by LR-ISG-2012-01, "Wall Thinning Due to Erosion Mechanisms."

Audit Activities

The table below lists documents that were reviewed by the staff and were found relevant to the program. The staff will document its review of this information in the SE.

Document	Title	Revision / Date
CL-PBD-AMP-XI.M17	Flow-Accelerated Corrosion Program Basis Document	Rev. 01
ER-AA-430	Conduct of Flow-Accelerated Corrosion Activities (Constellation Proprietary)	Rev. 10
ER-AA-430-1001	Guidelines for Flow-Accelerated Corrosion Activities (Constellation Proprietary)	Rev. 15
ER-AA-430-1004	Erosion in Piping and Components (EPC) Guide (Constellation Proprietary)	Rev. 5
14-0358-TR-001	Altran – Erosion in Piping and Components Program Basis Document	Rev. 0
LR-CPS-M05-1074	Drawing – Piping and Instrument Diagram for High Pressure Core Spray System	Rev. A
AR04280463	Low Pressure Core Spray Piping Below Minimum Wall Thickness Between 1E21-D001 and 1E21-F011	09/19/2019
AR04424407	1CC48AA Ultrasonic Test Results Below Acceptance Criteria	05/18/2021
CL-AMPBD-CTW	Closed Treated Water System Inspection Sample Basis Document, Attachment 7, Erosion Sample Population, Selection and Inspection	Rev. 1

Document	Title	Revision / Date
ER-AA-5400-1001	Raw Water Piping Integrity Management Guidance, Attachment 8, Corrosion Rate and Remaining Life Evaluation (Constellation Proprietary)	Rev. 12
AR04296225	Residual Heat Removal C Room Cooler Leakage Due to Erosion Corrosion	11/11/2019
AR04352219	Residual Heat Removal 1A Room Cooler Pin Hole Leak Due to Erosion Corrosion	06/24/2020

During the audit, the staff verified the applicant's claim that the "scope of program," "preventive actions," "parameters monitored or inspected," "detection of aging effects," "monitoring and trending," "acceptance criteria," and "corrective actions" program elements of the LRA AMP are consistent with the corresponding elements of the GALL-LR Report AMP.

The staff also verified the applicant's claim that aspects of the "scope of program," "detection of aging effects," "monitoring and trending," and "acceptance criteria" program elements, not associated with the exception identified in the LRA, are consistent with the corresponding program elements in the GALL-LR Report AMP.

The staff also audited the description of the Flow-Accelerated Corrosion program provided in the FSAR supplement. The staff verified this description is consistent with the description provided in the SRP-LR.

LRA AMP B.2.1.11 Bolting Integrity

Summary of Information in the Application

The LRA states that AMP B.2.1.11, "Bolting Integrity," is an existing program with enhancement(s) that will be consistent with the program elements in GALL-LR Report AMP XI.M18, "Bolting Integrity." To verify this claim of consistency, the staff audited the LRA AMP. During the audit, the staff also reviewed the enhancements associated with this AMP. The staff will document its review of the enhancements in the SE.

Audit Activities

During its audit, the staff interviewed the applicant's staff and reviewed documentation contained in the LRA and provided by the applicant via the ePortal.

For the operating experience (OE) review, the applicant made a presentation on the process used to identify and evaluate the pertinent OE. Afterwards, the staff conducted its review of the applicant's methodology and OE by reviewing documentation contained in the LRA and ePortal.

The table below lists documents that were reviewed by the staff and were found relevant to the program. The staff will document its review of this information in the SE.

Document	Title	Revision / Date
CL-PBD-AMP-XI.M18	AMP Basis Document: CPS, Unit 1, License Renewal Project – Bolting Integrity	Rev. 1
FSAR	CPS Final Safety Analysis Report	Rev. 23

Document	Title	Revision / Date
CC-AA-102	Design input and Configuration Change Impact Screening (Constellation Proprietary)	Rev. 34
ER-AA-2030	Conduct of equipment reliability manual (Constellation Proprietary)	Rev. 28
MA-AA-410	Bolting integrity aging management program (Constellation Proprietary)	Rev. 3
MA-AA-736-600	Torquing and tightening of bolted connections (Constellation Proprietary)	Rev. 13
MA-CL-736-6001	Tightening of flange connections (Constellation Proprietary)	Rev. 1
PES-S-010	Fasteners, Exelon Standard (Constellation Proprietary)	Rev. 5
PES-S-003	In-storage maintenance of nuclear material (Constellation Proprietary)	Rev. 3
AR 4104823	0WE050 valve bonnet bolt found broken off	02/16/2018
AR 4136734	Drivers bolt inspection locates loose jam nut on ECCS strainer	05/11/2018
AR 4136970	Drivers found 6 loose jam nuts on 1E12D331 ECCS strainer	05/12/2018
AR 4187378	Division 2 DG 12 cyl fuel pump bolt found loose	10/24/2018
AR 4184866	Division 2 DG 12 cyl fuel pump bolt found loose	10/18/2018
AR 04308427	WO 4989167-02 found oil leak at oil filter housing bolt	01/07/2020
AR 03960667	EOID: OACO1T Tank-Piping degradation - flange and bolts, a small pile of acid residue	01/08/2017
AR 04309402	Evaluate safety related bolting	01/10/2020
AR 02611436	Seismic Test for SPD relay panel, not tested per requirement - Verify bolting torque	01/12/2016
WO 01765922	Divers inspect/clean screenhouse structure	12/12/2016
EPRI NP-5769	Degradation and Failure of Boiling in Nuclear Power Plants	04/1988
EPRI TR-104213	Bolted Joint Maintenance & Application Guide	12/1995
NUREG-1339	Resolution of Generic Safety Issue 29: Bolting Degradation or Failure in Nuclear Power Plants	

During the audit, the staff verified the applicant's claim that the "scope of program," "preventive actions," "parameters monitored or inspected," "detection of aging effects," "monitoring and trending," "acceptance criteria," and "corrective actions" program element(s) of the LRA AMP are consistent with the corresponding elements of the GALL-LR Report AMP or will be consistent after implementation of the identified enhancements.

During the audit the staff made the following observation:

- The Fire Pump closure bolting was not considered in Enhancement 1.

- AMP XI.M18 program was considered for the Table 1 Item: 3.3.2-17 (GALL #'s: V.D2.EP-73) with Note E,1 from XI.M2, "Water Chemistry," AMP Program.

- AMP XI.M18 program was considered for the Table 1 Item: 3.3.1-64 (GALL #'s: VII.G.A-33) with Note E,1 from XI.M27, "Fire Water System," AMP Program.

- In Table 3.3.2-12, "Open Cycle Cooling System", Note "H, 2," was used for the Component Type of "bolting (closure)," with Material of "Carbon and Low Alloy Steel," under Environment of "Raw Water (External)," where no specific line-items were identified in the LR SRP (NUREG-1800) and GALL (NUREG-1801). In the LRA, "H" is defined as "Aging effect not in NUREG-1801 for this component, material and environment combination," and "1" is defined as "Consistent with operating experience contained in NUREG-2191 (Item VII.C1.A-787a), PVC piping components in a Raw Water environment are susceptible to Loss of Material. Components with this material and environment combination are managed by the Open-Cycle Cooling Water System AMP."

The staff also audited the description of the LRA AMP provided in the FSAR supplement in Section A.2.1.11, "Bolting Integrity." The staff verified this description is consistent with the description provided in the SRP.

LRA AMP B.2.1.12, Open Cycle Cooling Water

Summary of Information in the Application

LRA Section B.2.1.12 states that the Open Cycle Cooling Water System program is an existing program with enhancements that will be consistent with GALL-LR Report AMP XI.M20, "Open Cycle Cooling Water System program," as modified by LR ISG 2013-01, "Aging Management of Loss of Coating or Lining Integrity for Internal Coatings/Linings on In-Scope Piping, Piping Components, Heat Exchangers, and Tanks," and LR-ISG-2012-02, "Aging Management of Internal Surfaces, Fire Water Systems, Atmospheric Storage Tanks, and Corrosion Under Insulation."

Audit Activities

The table below lists documents that were reviewed by the staff and were found relevant to the program. The staff will document its review of this information in the SE.

Document	Title	Revision / Date
CL-PBD-AMP-XI.M20	Open-Cycle Cooling Water System	Rev. 3
1003.10	Clinton Power Station CPS Program for NRC Generic Letter 89-13 Markup (Constellation Proprietary)	Rev. 008
ER-AA-340	GL 89-13 Program Implementing Procedure (Constellation Proprietary)	Rev. 11
2602.01	Heat Exchanger Performance of Shutdown Service Water Coolers Covered by NRC Generic Letter 89-13 (Constellation Proprietary)	Rev. 019
2700.12	Division 1 SX System Flow Balance Verification (Constellation Proprietary)	Rev. 015

Document	Title	Revision / Date
2700.20	RHR A(B) Heat Exchanger, 1E12B001A(B) Thermal Performance Test Covered by NRC Generic Letter 89-13 (Constellation Proprietary)	Rev. 8a

During the audit, the staff verified the applicant's claim that the "scope of program," "preventive actions," "parameters monitored or inspected," "detection of aging effects," "monitoring and trending," "acceptance criteria," and "corrective actions" program elements of the LRA AMP are consistent with the corresponding elements of the GALL-LR Report AMP.

The staff also audited the description of the Open Cycle Cooling Water AMP provided in the FSAR supplement. The staff verified this description is consistent with the description provided in the SRP-LR.

LRA AMP B.2.1.13, Closed Treated Water Systems

Summary of Information in the Application

The LRA states that AMP B.2.1.13, "Closed Treated Water Systems," is an existing program with an enhancement and exceptions that will be consistent with the program elements in GALL-LR Report AMP XI.M21A, "Closed Treated Water Systems," as modified by LR-ISG-2012-02 and LR-ISG-2013-01.

Audit Activities

The table below lists documents that were reviewed by the staff and were found relevant to the program. The staff will document its review of this information in the SE.

Document	Title	Revision / Date
CL-PBD-AMP-XI.M21A	Closed Treated Water Systems Program Basis Document	Rev. 04
CY-AA-120-4000	Closed Cooling Water Chemistry Strategic Plan (Constellation Proprietary)	Rev. 011
CY-AA-120-400	Closed Cooling Water Chemistry (Constellation Proprietary)	Rev. 021
CY-AA-120-4200	Corrosion Monitoring Guidelines (Constellation Proprietary)	Rev. 006
MA-AA-716-010	Maintenance Planning (Constellation Proprietary)	Rev. 33
PM Modification Request	PMMR PMRQ CTW AMP	N/A
PM Modification Request	PMMR PMRQ CTW AMP – Erosion	N/A

During the audit, the staff verified the applicant's claim that the "scope of program," "preventive actions," "parameters monitored or inspected," "detection of aging effects," "monitoring and trending," "acceptance criteria," and "corrective actions" program elements of the LRA AMP will

be consistent with the corresponding elements of the GALL-LR Report AMP after implementation of the identified enhancements.

The staff also verified the applicant's claim that aspects of the "scope of program," "parameters monitored or inspected," and "detection of aging effects" program elements not associated with the exceptions identified in the LRA during the audit are consistent with the corresponding program elements in the GALL-LR Report AMP.

The staff also audited the description of the Closed Treated Water Systems AMP provided in the FSAR supplement. The staff verified this description is consistent with the description provided in the SRP-LR.

LRA AMP B.2.1.14 Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems

Summary of Information in the Application

The LRA states that AMP B.2.1.14, "Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems," is an existing program with an enhancement that will be consistent with the program elements in GALL-LR Report AMP XI.M23, "Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems." To verify this claim of consistency, the staff audited the LRA AMP. During the audit, the staff also reviewed the enhancement associated with this AMP. The staff will document its review of the enhancements in the SE.

Audit Activities

During its audit, the staff interviewed the applicant's staff and reviewed documentation contained in the LRA and provided by the applicant via the ePortal.

For the operating experience (OE) review, the applicant made a presentation on the process used to identify and evaluate the pertinent OE. Afterwards, the staff conducted its review of the applicant's methodology and operating experience by reviewing documentation contained in the LRA and ePortal.

The table below lists documents that were reviewed by the staff and were found relevant to the program. The staff will document its review of this information in the SE.

Document	Title	Revision / Date
CL-PBD-AMP-XI.M23	AMP Basis Document: CPS, Unit 1, License Renewal Project – Inspection of Overhead Heavy Load and Light Load (related to Refueling) Handling Systems Program	Rev. 2
FSAR	CPS Final Safety Analysis Report	Rev. 23
MA-AA-716-021	Rigging and Lifting Program (Constellation Proprietary)	Rev. 36
MA-AA-716-022	Control of Heavy Loads Program (Constellation Proprietary)	Rev. 15
AR 02436853	1HC02G: 1 loose bolt found during crane inspection	01/13/2015

Document	Title	Revision / Date
AR 04282958	Minor discrepancies during refuel bridge (F15) walkdown	09/27/2019
ECR 417375	WO 1710259-01 inspection 1 loose bolt was found	01/14/2015
AR 03987841	Crane outage of MLC leaking oil	03/21/2017
AR 04209989	N and S TB overhead cranes safety mitigation	01/11/2019
AR 02436853	1HC02G: 1 loose bold found during crane inspection - bolt is located on the west site. G-104 on the crane rail upper	01/13/2015
WO 04762983	Pre-outage auxiliary platform - 1F15E005	08/23/2019
WO 04776177	Perform Fuel handling platform test	03/06/2019
WO 04996023	1HC65G CRD CART jib crane periodic inspection	09/30/2021
WO 04978705	Transfer of irradiated component	10/10/2021
WO 05233950	1HC01G annual crane/rail inspection	03/02/2023
WO 05245155	1HCO&G crane mechanical annual inspection	04/20/2023
WO 01710259	1HC02G crane mechanical inspection	11/14/2014
WO 04805147	1F15E003 outage repair fuel platform	02/27/2020
CMAA, Specification, No.70	Specification for Electric Overhead Traveling Cranes	1975
NUREG-0554	Single-Failure Proof Cranes for Nuclear Power Plants	05/1979
NUREG-0612	Control of Heavy Loads at Nuclear Power Plants	07/1980
ASME NUM-1	Rules for Construction of Cranes, Monorails, and Hoists (With ridge or Trolley or Hoist of the Underhung Type)	2016
ASME NOG-1	Rules for Construction of Overhead and Gantry Cranes (Top Running Bridge, Multiple Girder)	2015
ASME B30.2	Overhead and Gantry Cranes (Top Running Bridge, Single or Multiple Girder, Top Running Trolley Hoist)	2005
ASME B30.16	Overhead Hoists (Underhung)	2016

During the audit, the staff verified the applicant's claim that the "scope of program," "preventive actions," "parameters monitored or inspected," "detection of aging effects," "monitoring and trending," "acceptance criteria," and "corrective actions" program element(s) of the LRA AMP are consistent with the corresponding elements of the GALL-LR Report AMP or will be consistent after implementation of the identified enhancements.

During the audit the staff made the following observation:

- In LRA, AMP XI.M23 program was considered for the Table 1 Item: 3.3.1-25 (GALL #'s: VII.E4.AP-110 and –130) with Note E,1 from XI.M2, "Water Chemistry," program.

The staff also audited the description of the LRA AMP provided in the FSAR supplement in Section A.2.1.14, "Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems." The staff verified this description is consistent with the description provided in the SRP.

LRA AMP B.2.1.15, Compressed Air Monitoring

Summary of Information in the Application

The LRA states that AMP B.2.1.15, “Compressed Air Monitoring,” is an existing program with enhancement and exception that will be consistent with the program elements in GALL-LR Report AMP XI.M15, “Compressed Air Monitoring,” as modified by LR-ISG-2013-01. At the time of the audit, the applicant had not yet fully developed the documents necessary to implement this enhanced program, and the staff’s audit addressed only the program elements described in the applicant’s basis document.

Audit Activities

During its audit, the staff interviewed the applicant’s staff and reviewed documentation contained in the LRA and provided by the applicant via the ePortal.

For the operating experience (OE) review, the applicant made a presentation on the process used to identify and evaluate the pertinent OE. Afterwards, the staff conducted its review of the applicant’s methodology and operating experience by reviewing documentation contained in the LRA and ePortal.

The table below lists the documents that were reviewed by the staff and were found relevant to the program. The staff will document its review of this information in the SE.

Document	Title	Revision / Date
CL-PBD-AMP-XI.M24	Program XI.M24 Compressed Air Monitoring	Rev. 2
ER-AA-700-405	Compressed Air Monitoring Aging Management Program (Constellation Proprietary)	Rev. 2
WO 01702778	Change Oil Replace Disc Filter, Clean Inspect	03/02/2015
WO 05076637-01	Inspect Dryer Desiccant/ Replace As Necessary	02/22/2022
CPS-1820	Periodic Blowdown of the IS/SA System (Constellation Proprietary)	04/22/1996
ER-AA-2030	Conduct of Equipment Reliability Manual (Constellation Proprietary)	Rev. 29

During the audit, the staff verified the applicant’s claim that the “scope of the program,” “preventive actions,” “detection of aging effects,” and “corrective actions” program elements of the LRA AMP are consistent with the corresponding elements of the GALL-LR Report AMP after implementation of the identified enhancements.

The staff also verified the applicant’s claim that aspects of the “monitoring and trending,” program element not associated with the exception identified in the LRA or by the staff during the audit are consistent with the corresponding program elements in the GALL-LR Report AMP. The staff also audited the description of the LRA AMP “Compressed Air Monitoring” program provided in the FSAR supplement. The staff verified this description is consistent with the description provided in the SRP-LR.

LRA AMP B.2.1.16, Fire Protection Program

Summary of Information in the Application. The LRA) states that AMP B.2.1.16, "Fire Protection Program," is an existing program with enhancements that will be consistent with the program elements in GALL-LR Report AMP XI.M26, "Fire Protection." The applicant considered SLR-ISG-2021-02, "Updated Aging Management Criteria for Mechanical Portions of Subsequent License Renewal Guidance, Interim Staff Guidance" (ML20181A434), as part of operating experience. To verify this claim of consistency, the staff audited the LRA AMP. The staff's audit addressed the description of the enhancements in the LRA and the applicant's basis document, and markups of program implementation documents.

Audit Activities. The table below lists documents that were reviewed by the staff and were found relevant to the Fire Protection program. The staff will document its review of this information in the SE.

Document	Title/Description	Revision / Date
CL-PBD-AMP-XI.M26	Program Basis Document	Revision 1
CPS 3822.05	Annual Halon System Functional Test (Constellation Proprietary)	Revision 8a
CPS 3822.05C004	Aux Electrical Equipment Room Computer Panel Halon System (Constellation Proprietary)	Revision 1
CPS 9071.09	Fire Protection Diesel Generator Bay 1A CO_2 System Auto Actuation Test (Constellation Proprietary)	Revision 37a
CPS 9071.09P001	Fire Protection Diesel Generator Bay 1A CO_2 System Puff Test (Constellation Proprietary)	Revision 0
CPS 9071.25	Fire Protection CO2 Weekly Operability Check (Constellation Proprietary)	Revision 026
CPS 9476.03	MCR Halon System Operability Test and Tank Weight/Pressure Verification (Constellation Proprietary)	Revision 39a
CPS 9601.01	Fire Rated Assemblies and Penetration Sealing Devices (Constellation Proprietary)	Revision 29a
CPS 9601.01C001	Fire Rated Assembly/Penetration Seal Inspections Checklist (Constellation Proprietary)	Revision 26c
CPS 9601.01C002	Fire Damper Inspections Checklist (Constellation Proprietary)	Revision 28g
CPS 9601.01C003	10% Per 18 Month Accessible Seal Inspections Checklist (Constellation Proprietary)	Revision 27b
CPS 9601.01C005	Thermolag Cable Tray Wrap Inspections Checklist (Constellation Proprietary)	Revision 26
CPS 9601.01C006	Interam (3M) Cable Tray Wrap Inspections Checklist (Constellation Proprietary)	Revision 22a
CPS 9601.01C009	12.5% Per 24 Month Inaccessible Seal Inspections Checklist (Constellation Proprietary)	Revision 0c
CPS 9601.01C010	Fire Rated Barrier Intersections Inspection Checklist (Constellation Proprietary)	Revision 0a

Document	Title/Description	Revision / Date
CPS 9601.01C011	Structural Fireproofing Inspections Checklist (Constellation Proprietary)	Revision 0
CPS 9601.05	Visual Inspection of Closed Fire Doors (Constellation Proprietary)	Revision 25d
CPS 9601.05C001	Closed Fire Door Inspection Checklist (Constellation Proprietary)	Revision 32d
CPS 9601.06	Fire Door and Secondary Containment Doors Inspections (Constellation Proprietary)	Revision 29g
CPS 9601.06C001	Semi-Annual Fire Door Operability Checklist (Constellation Proprietary)	Revision 31b
CPS 9601.13C001	Fire damper drop test checklist (Constellation Proprietary)	Revision 20
AR02450515	Fire proofing determined degraded	February 10, 2015
AR02729945	Fire door inspection failures	October 19, 2016
AR04551278	Fire protection health red cornerstones / red overall	January 30, 2023
WO01804340	Structural fireproofing degraded	May 26, 2015
WO01930611	Fire door hardware inspections	October 17, 2016
AR02443725	Structural fireproofing degraded	January 28, 2015
AR01593901	Structural fireproofing concerns	December 6, 2013
AR02489917	Degraded Fire Barrier Walls	April 23, 2015
AR02595268	Turning vanes prevent complete inspection of fire damper	December 3, 2015
AR02658452	Deficient fire/flood seal	April 20, 2016
AR04288768	Fire seal not full depth in penetration	October 17, 2019
AR04290966	Void in fire rated concrete block wall	October 24, 2019
IR04301533	Fire Protection System and Program Health	January 17, 2020
AR04475263	Grout degraded	February 1, 2022

During the audit, the staff verified that for the program elements that the applicant declared were consistent, the “preventive actions,” “parameters monitored or inspected,” “monitoring and trending,” “acceptance criteria,” and “corrective actions” program elements of the LRA AMP are consistent with the corresponding elements of the GALL-LR Report AMP.

In addition, the staff found that for the “scope of the program” and “detection of aging effects” program elements, sufficient information was not available to determine whether they are

consistent with the corresponding program elements of the GALL-LR Report AMP. The staff will consider issuing RAIs in order to obtain the information necessary to verify whether the program elements are consistent with the corresponding program elements of the GALL-LR Report AMP.

During the audit of the "operating experience" program element, the staff reviewed a search of results of the plant-specific database to identify any previously unknown or recurring aging effects. The staff will evaluate the identified plant-specific operating experience in the SE.

The staff also audited the description of the LRA Fire Protection program provided in the FSAR supplement. The staff verified this description is consistent with the description provided in the GALL-LR Report.

LRA AMP B.2.1.17, Fire Water System Program

Summary of Information in the Application

The license renewal application (LRA) states that Aging Management Program (AMP) B.2.1.17, "Fire Water System Program," is an existing program with exceptions and enhancements that will be consistent with the program elements in GALL-LR Report AMP XI.M27, "Fire Water System," modified by LR-ISG-2012-02 and LR-ISG-2013-01. To verify this claim of consistency, the staff audited the LRA AMP. The staff's audit addressed the description of the enhancements in the LRA and the applicant's basis document, and markups of program implementation documents.

Audit Activities

The table below lists documents that were reviewed by the staff and were found relevant to the Fire Water System program. The staff will document its review of this information in the SE.

Document	Title	Revision / Date
CL-PD-AMP-XI.M27	Program Basis Document - Fire Water System	Rev. 1
1893.01	CPS Administrative Requirements for Fire Protection (Constellation Proprietary)	Rev. 23
2400.01	Circulating Water Screenhouse (CWSH) Intake Structure Inspection (Constellation Proprietary)	Rev. 9
3830.01	Traveling Screen Agitation and Differential Pressure Test (Constellation Proprietary)	Rev. 6c
9071.02	Diesel Fire Pump Capacity Checks (Constellation Proprietary)	Rev. 45c
9071.04	Fire Protection Water System Flow Test (Constellation Proprietary)	Rev. 35
9071.12	Deluge Spray Nozzle Flow Test (Constellation Proprietary)	Rev. 27d
9071.15	Fire Protection Hose Station Valve Operability Test (Constellation Proprietary)	Rev. 23f
9071.22	Fire Protection Flow Check and Visual Inspection of Fire Hydrants (Constellation Proprietary)	Rev. 27e

Document	Title	Revision / Date
9071.22C001	Fire Protection Flow Check and Visual Inspection of Fire Hydrants for the Protected Area (Constellation Proprietary)	Rev. 26a
9071.28	Fire Protection Hose Station Low Point Flow/Flush (Constellation Proprietary)	Rev. 0c
9601.10	Visual Inspection of Spray and Sprinkler System Piping and Heads (Constellation Proprietary)	Rev. 22f
NA	New Procedure Internal Inspections – Wet Pipe Pre-action Sprinklers System	Rev. 0
9071.22 PMID 00158954	PM Modification Request - One Minute Flow Duration Specification	
3213.01P002	Fire Protection Valves/Deluge/WPS/APS/MPS/Sprinkler Systems (Constellation Proprietary)	Rev. 1e
NA	New Procedure 50 year Sample Testing of Fire Water System Sprinkler Heads	Rev. 0
CC-AA-211	Fire Protection Program (Constellation Proprietary)	Rev. 9
AR 01588993	Fire Protection Piping Not Draining as Designed	11/22/2013
AR 02388125	Deluge Nozzles Clogged	09/30/2014
AR 02501642	Fire Protection Piping Degraded	05/16/2015
AR 04113292	Level 3 Operating Experience Review – Pre-Action Sprinkler System Rupture	03/09/2018
AR 04204764	Valve Internals Eroded Away	12/20/2018
AR 04480847	Fire Pump A Room Floor Covered in Water	02/26/2022
OPXR 04086744	Operating Experience Evaluation - Pre-Action Sprinkler Rupture	03/25/2019
AR 01682644	Fire Pump A Discharge Low Point Drain Clogged	07/16/2014
AR 01690868	Fire Protection Valve Could Not Be Cycled	08/09/2014
AR 02557198	Extent of Condition Walkdown of FP Piping and Hose Houses	09/18/2015
AR 02700365	Sprinkler Nozzle Obstruction	08/03/2016
AR 02720861	Hydrant Not Draining	09/27/2016
AR 03972582	Minor Damage on Traveling Screen E	02/10/2017
AR 04065373	Hydrant Valve Would Not Drain	10/21/2017
AR 04089595	Hydrant Broken Below Flange	01/03/2018

Document	Title	Revision / Date
AR 04106736	Standing Water in Fire Pump B Room	02/21/2018
AR 04209479	Excessive Buildup Inside Pipe	01/09/2019
AR 04296850	Ice Formed Inside Exterior Hose Rack at Screen House	11/13/2019
AR 04297592	Clogged Traveling Screen Trough	11/15/2019
AR 04435752	Debris at Bar Racks Caused Autostart of Traveling Screens	07/19/2021
AR 04529881	Fire Pump A Coolant System Heating Up Faster than Expected	10/17/2022
AR 04675662	Fire Pump A cooling water strainer clogged	05/04/2023
AR 04684743	Ultrasonic Testing (UT) Reading Found Below Minimum Required Thickness	06/14/2023
AR 04686005	Low UT Readings	06/21/2023
AR 01613849	Fire Suppression System Leak	01/28/2014
AR 01625219	Assessment of Leaks Associated with Fire Pump A Room	02/24/2014
AR 01649150	As Left Inspection of Failed Fire Protection Piping	04/18/2014
AR 01680386	Engine Coolant Leak on Fire Pump A Water Manifold	07/10/2014
AR 2387881	Stem Leakage on Hydrant 26	09/29/2014
AR 02556073	Walk Down of Potential Fire Protection Piping Leak South of Fuel Building	09/16/2015
AR 04686005	Low UT Readings Obtained on 12” Fire Protection Piping	06/21/2023

During the audit, the staff verified that for the program elements that the applicant declared was consistent, the “preventive actions,” “monitoring and trending,” and “corrective actions” program elements of the LRA AMP are consistent with the corresponding elements of the GALL-LR Report AMP.

The staff also verified the applicant’s claim that aspects of the “detection of aging effects” and “acceptance criteria” program elements not associated with the exception and enhancements identified in the LRA are consistent with the corresponding program elements in the GALL-LR Report AMP.

In addition, the staff found that for the “scope of the program” and “parameters monitored or inspected” program elements, sufficient information was not available to determine whether they are consistent with the corresponding program elements of the GALL-LR Report AMP. The staff will consider issuing RAIs in order to obtain the information necessary to verify whether the program elements are consistent with the corresponding program elements of the GALL-LR Report AMP.

During the audit of the “operating experience” program element, the staff reviewed a search of results of the plant-specific database to identify any previously unknown or recurring aging effects. The staff will evaluate the identified plant-specific OE in the SE.

The staff also audited the description of the LRA Fire Water System Program provided in the FSAR supplement. The staff verified this description is consistent with the description provided in the GALL-LR Report.

LRA AMP B.2.1.18, Aboveground Metallic Tanks

Summary of Information in the Application

The LRA states that AMP B.2.1.18, “Aboveground Metallic Tanks,” is a new program that will be consistent with the program elements in GALL-LR Report AMP XI.M29, “Aboveground Metallic Tanks,” as modified by LR-ISG-2012-02 and LR-ISG-2013-01. At the time of the audit, the applicant had not yet fully developed the documents necessary to implement this new program, and the staff’s audit addressed only the program elements described in the applicant’s basis document.

Audit Activities

For the operating experience (OE) review, the applicant made a presentation on the process used to identify and evaluate the pertinent OE. Afterwards, the staff conducted its review of the applicant’s methodology and operating experience by reviewing documentation contained in the LRA and ePortal.

The table below lists the documents that were reviewed by the staff and were found relevant to the Aboveground Metallic Tanks program. The staff will document its review of this information in the SE.

Document	Title	Revision / Date
CL-PBD-AMP-XI.29	Aboveground Metallics Tanks	Rev. 1
ER-AA-5400-1002	Underground Piping and Tank Examination Guide (Constellation Proprietary)	Rev. 10
JN-D51749	29’-11(1/4)” Diameter 29’-6” Hight Aluminum RCIC Storage Tank	12/17/1976
A28-1406	RCIC Storage Tank Valve Room Sections and Elevations Clinton Power Station Unit 1 Illinois Power Company Clinton, Illinois	10/04/1977
WO:01766587-01	UT Bottom of RCIC Storage Tank 1RI01T	11/27/2017
AR-04038740	Pre-Determine Next Schedule RCIC Tank Inspection Based on Wall Loss	09/29/2017
AR-01131148	Nuclear Event Report (NER) NC-10-056	01/31/2010

During the audit, the staff verified the applicant’s claim that the “scope of program,” “preventive actions,” “parameters monitored or inspected,” “detection of aging effects,” “monitoring and trending,” “acceptance criteria” and “corrective actions” program elements of the LRA AMP are consistent with the corresponding elements of the GALL-LR Report AMP.

The staff also audited the description of the LRA Aboveground Metallic Tanks program provided in the FSAR supplement. The staff verified this description is consistent with the description provided in the SRP-LR Report.

LRA AMP B.2.1.19, Fuel Oil Chemistry

Summary of Information in the Application

The LRA states that AMP B.2.1.19, "Fuel Oil Chemistry," is an existing program with enhancements that will be consistent with the program elements in GALL-LR Report AMP XI.M30, "Fuel Oil Chemistry," as modified by LR-ISG-2013-01. At the time of the audit, the applicant had not yet fully developed the documents necessary to implement this enhanced program and the staff's audit addressed only the program elements described in the applicant's basis document.

Audit Activities

During its audit, the staff reviewed documentation contained in the LRA and provided by the applicant via the ePortal.

For the operating experience (OE) review, the applicant made a presentation on the process used to identify and evaluate the pertinent OE. Afterwards, the staff conducted its review of the applicant's methodology and operating experience by reviewing documentation contained in the LRA and ePortal.

The table below lists documents that were reviewed by the staff and were found relevant to the Fuel Oil Chemistry Program. The staff will document its review of this information in the SE.

Document	Title	Revision / Date
CL-PBD-AMP-XI.M30	GALL Program XI.M30 Fuel Oil Chemistry	Rev. 2
CL-PBD-AMP-XI.M32	Program Basis Document One Time Inspection	Rev. 4
CY-AA-120-5000	Diesel Fuel Oil Program Guide (Constellation Proprietary)	Rev. 1
CY-CL-1937-01	Diesel Fuel Oil Testing Program (Constellation Proprietary)	Rev. 1
Clinton Power Station CR AR-01478359	CDBI FASA: EDG Fuel Oil Practices Procedures	07/18/2013
CY-CL-6423-02	Diesel Fuel Oil Water and Sediment Content (Constellation Proprietary)	Rev. 2
CY-CL-6423-04	Determination of Diesel Fuel Particulate Contamination by Laboratory Filtration (Constellation Proprietary)	Rev. 2
Drawing K-2842	Diesel Generator Oil Stg Tank	02/09/1982
Drawing DT-77-267	Diesel Generator Fuel Oil Day Tank	Rev. 5

During the audit, the staff verified the applicant's claim that the "scope of program," "acceptance criteria" and "corrective actions" program elements of the LRA AMP are consistent with the corresponding elements of the GALL-LR Report AMP.

During the audit, the staff verified applicant's claim that the "preventive actions," "parameters monitored or inspected" "detection of aging effects" and "monitoring and trending" program elements of the LRA AMP will be consistent after implementation of the identified enhancements with the corresponding elements of the GALL-LR Report AMP.
The staff also audited the description of the LRA AMP provided in the FSAR supplement. The staff verified this description is consistent with the description provided in the SRP-LR.

LRA AMP B.2.1.20, Reactor Vessel Surveillance

Summary of Information in the Application

The LRA states that AMP B.2.1.20, "Reactor Vessel Surveillance," is an existing program with an exception that is consistent with the program elements in GALL--LR Report AMP XI.M31, "Reactor Vessel Surveillance."

Audit Activities

In addition to the OE documentation contained in the LRA and ePortal, the staff observed the applicant's search of its operating experience database using the keyword: "embrittlement", "fluence."

The table below lists documents that were reviewed by the staff and were found relevant to the program. The staff will document its review of this information in the SE.

Document	Title	Revision / Date
CPS-PBD-AMP-XI.M31	Program Basis Document - "Reactor Vessel Surveillance"	Rev. 1
	Final Safety Analysis Report – Section 5	Rev. 21
ER-AB-331-103	BWR VESSEL INTEGRATED SURVEILLANCE PROGRAM IMPLEMENTATION (Constellation Proprietary)	Markup of Rev 006
BWRVIP-86	UPDATED BWR INTEGRATED SURVEILLANCE PROGRAM (ISP) IMPLEMENTATION PLAN	Rev. 1-A

During the audit, the staff verified the applicant's claim that the "scope of program," "preventive actions," "parameters monitored or inspected," "monitoring and trending," "acceptance criteria," and "corrective actions" program element(s) of the LRA AMP is consistent with the corresponding elements of the GALL-LR Report AMP. The staff also verified the applicant's claim that aspects of the "detection of aging effects," program element not associated with the exception identified in the LRA or by the staff during the audit are consistent with the corresponding program elements in the GALL-LR Report AMP. The staff's review of the exception to the "detection of aging effects," program element will be documented in the SE.

During the audit, the staff made the following observation:

- FSAR Section 5.3.1.6.1, Compliance with "Reactor Vessel Material Surveillance Program Requirements" indicates in 2003, the NRC approved Clinton Power Station's

participation in the BWR Vessel and Internals Project (BWRVIP) Integrated Surveillance Program (ISP) as described in BWRVIP-78 and BWRVIP-86. Additionally, the current withdrawal schedule is based on the latest NRC approved revision of BWRVIP-86, which is Revision 1-A.

The staff also audited the description of the LRA AMP provided in the FSAR supplement. The staff verified this description is consistent with the description provided in the SRP-LR.

LRA AMP B.2.1.21, One-Time Inspection

Summary of Information in the Application

The LRA states that AMP B.2.1.21, "One-Time Inspection Program," is a new program that will be consistent with the program elements in GALL-LR Report AMP XI.M32, "One-Time Program." At the time of the audit, the applicant had not yet fully developed the documents necessary to implement this new program, and the staff's audit addressed only the program elements described in the applicant's basis document.

Audit Activities

The table below lists documents that were reviewed by the staff and were found relevant to the program. The staff will document its review of this information in the SE.

Document	Title	Revision / Date
CL-PBD-AMP-XI.M32	One-Time Inspection	Rev 1
IR 04509371	Chemistry Off-Normal entered (Sulfates > AL1), Condensate Polishing	07/05/2022
IR-04509371-07 (PI-AA-125-1001)	Root Cause Report	Rev 6
IR- 04517759 (PI-AA-126-1001-F-01)	Self-Assessment-Aboveground and Underground Storage Tanks	Rev 5
IR- 04552063	Clinton Tank Self-Assessment QTR 4 2022	02/02/2023
IR- 03971733	Need Oil Changed Based on Oil Condition of The Last Sample	02/08/2017

During the audit, the staff verified the applicant's claim that the "scope of program," "preventive actions," "parameters monitored or inspected," "detection of aging effects," "monitoring and trending," "acceptance criteria," and "corrective actions" program elements of the LRA AMP are consistent with the corresponding elements of the GALL-LR Report AMP.

The staff also audited the description of the LRA provided in the FSAR supplement. The staff verified this description is consistent with the description provided in the SRP-LR.

LRA AMP B.2.1.22, Selective Leaching

Summary of Information in the Application

The LRA states that AMP B.2.1.22, "Selective Leaching," is a new program with an exception that will be consistent with the program elements in GALL-LR Report AMP XI.M33, "Selective Leaching," as modified by LR-ISG-2011-03, LR-ISG-2015-01, and LR-ISG-2012-02. At the time of the audit, the applicant had not yet fully developed the documents necessary to implement this new program, and the staff's audit addressed only the program elements described in the applicant's basis document.

Audit Activities

The table below lists documents that were reviewed by the staff and were found relevant to the program. The staff will document its review of this information in the SE.

Document	Title	Revision / Date
CL-PBD-AMP-XI.M33	Program Basis Document Selective Leaching, GALL Program XI.M33 – Selective Leaching	Rev. 1
ER-AA-700-401	Selective Leaching Aging Management (Constellation Proprietary)	Rev. 3
LR-AA-1609	Aging Management Reviews (AMR) (Constellation Proprietary)	Rev.1
CL-AMPBD-SLI	Selective Leaching Inspection Sample Basis Document	Rev. 0 and 1

During the audit, the staff verified the applicant's claim that the "preventive actions," "acceptance criteria," and "corrective actions" program elements of the LRA AMP will be consistent with the corresponding elements of the GALL-LR Report AMP. In addition, the staff found that for the "scope of program," "parameters monitored or inspected," "detection of aging effects," and "monitoring and trending" program elements, sufficient information was not available to determine whether they were consistent with the corresponding program elements of the GALL-LR Report AMP. The staff will consider issuing RAIs in order to obtain the information necessary to verify whether these program elements are consistent with the corresponding program elements of the GALL-LR Report AMP.

During the audit, the staff made the following observations:

- The staff reviewed CL-AMPBD-SLI (Revision 0) and noted that it discusses performing metallurgical analysis of components in place of visual examinations and that the sample size can be reduced by a factor of three (i.e., 6.7 percent or a maximum of nine components) if the entire material and environment population is evaluated using metallurgical analysis in lieu of visual examinations.

- The staff reviewed CL-AMPBD-SLI (Revision 1) and noted that the above discussion related to reducing sample size if metallurgical analyses are performed was removed.

The staff also audited the description of the LRA Selective Leaching program provided in the FSAR supplement. The staff found that sufficient information was not available to determine

whether the description provided in the FSAR supplement was an adequate description of the LRA Selective Leaching program. The staff will consider issuing RAIs in order to obtain the information necessary to verify the sufficiency of the FSAR supplement program description.

LRA AMP B.2.1.23, One-time Inspection of ASME Code Class 1 Small-Bore Piping

Summary of Information in the Application

The LRA states that AMP B.2.1.23, "One-time Inspection of ASME Code Class 1 Small-Bore Piping" is a new condition monitoring program that is consistent with the program elements in GALL-LR Report AMP XI.M35, "One-time Inspection of ASME Code Class 1 Small-Bore Piping." To verify this claim of consistency, the staff audited the LRA AMP.

Audit Activities

During its audit, the staff interviewed the applicant's staff, and reviewed documentation contained in the LRA and provided by the applicant via the ePortal.

For the operating experience (OE) review, the applicant provided a presentation on the process used to identify and evaluate the pertinent OE. Afterwards, the staff conducted its review of the applicant's methodology and evaluated the OE by reviewing the documentation contained in the LRA and ePortal.

The table below lists documents that were reviewed by the staff and were found relevant to the program. The staff will document its review of this information in the SE.

Document	Title	Revision / Date
CL-PBD-AMP-XI.M35	Clinton Power Station Unit 1, License Renewal Project: One-time Inspection of ASME Code Class 1 Small-Bore Piping	Rev. 1 02/29/2024
CL-C1R17-ISI Summary Report	Clinton Power Station Unit 1, Post Outage 90-Day Inservice Inspection (ISI) Summary Report– Aug 2017 Inspection Results	Rev. 0 08/2017
CL-C1R20-ISI Summary Report	Clinton Power Station Unit 1, Post Outage 90-Day Inservice Inspection (ISI) Summary Report – Jan 2022 Inspection Results	Rev. 0 01/2022
CL-C1R17-APR-02	GE Hitachi UT Examination Summary Sheet, Nozzle-to-Safe End N1B-W-1	05/23/2017
ER-AA-300	Conduct of Inservice Inspection Activities (Constellation Proprietary)	Rev. 19
AR 04012873	UT Indication in N1B-W1	05/19/2017

During the audit, the staff verified applicant's claim that the "scope of program," "preventive actions," "parameters monitored or inspected," "detection of aging effects," "monitoring and trending," "acceptance criteria," and "corrective actions" program elements of the LRA AMP are consistent with the corresponding elements of the GALL-LR Report AMP.

The staff also audited the description of the LRA AMP “One-time Inspection of ASME Code Class 1 Small-Bore Piping” provided in the FSAR Supplement. The staff verified that this description is consistent with the description provided in the SRP-LR Report.

LRA AMP B.2.1.24, External Surfaces Monitoring of Mechanical Components

Summary of Information in the Application

The LRA states that AMP B.2.1.24, “External Surfaces Monitoring of Mechanical Components,” is a new program that will be consistent with the program elements in GALL-LR Report AMP XI.M36, “External Surfaces Monitoring of Mechanical Components,” as modified by LR-ISG-2011-03 and LR-ISG-2012-02. At the time of the audit, the applicant had not yet fully developed the documents necessary to implement this new program, and the staff’s audit addressed only program elements described in the applicant’s basis document.

Audit Activities

The table below lists documents that were reviewed by the staff and were found relevant to the program. The staff will document its review of this information in the SE.

Document	Title	Revision / Date
CL-PBD-AMP-XI.M36	External surfaces Monitoring of Mechanical Components	Rev 1
AR-04281042	VP Insulation Walk Down Results	09/21/2019
AR 04352219	1VY03S RHR 1A Roomer Cooler thru leak	06/24/2020
AR 04408095	0WM118B through wall leak	03/11/2021
ER-AA-700-402	External Surfaces Monitoring of Mechanical Components Aging Management Program (Constellation Proprietary)	Rev 1
ER-CL-700-402	External Surfaces Monitoring of Mechanical Components Aging Management Program (Constellation Proprietary)	Rev 0
ER-AA-2030	Conduct of Equipment Reliability Manual (Constellation Proprietary)	Rev 27

During the audit, the staff verified the applicant’s claim that the “scope of program,” “preventive actions,” “parameters monitored or inspected,” “detection of aging effects,” “monitoring and trending,” “acceptance criteria,” and “corrective actions” program elements of the LRA AMP are consistent with the corresponding elements of the GALL-LR Report AMP.

The staff also audited the description of the LRA Section A.2.1.24, “External Surfaces Monitoring of Mechanical Components,” provided in the FSAR supplement. The staff verified this description is consistent with the description provided in the SRP-LR.

LRA AMP B.2.1.25, Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components

Summary of Information in the Application

The LRA states that AMP B.2.1.25, "Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components," is a new program that will be consistent with the program elements in GALL-LR Report AMP XI.M38, "Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components," as modified by LR-ISG-2012-02, "Aging Management of Internal Surfaces, Fire Water Systems, Atmospheric Storage Tanks, and Corrosion Under Insulation," and LR-ISG-2013-01, "Aging Management of Loss of Coating or Lining Integrity for Internal Coatings/Linings on In-Scope Piping, Piping Components, Heat Exchangers, and Tanks."

Audit Activities

The table below lists documents that were reviewed by the staff and were found relevant to the program. The staff will document its review of this information in the SE.

Document	Title	Revision / Date
CL-PBD-AMP-XI.M38	Program Basis Document - Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components	Rev. 1
ER-AA-700-403	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components Aging Management Program (Constellation Proprietary)	Rev. 3
ER-AA-2030	Conduct of Equipment Reliability Manual (Constellation Proprietary)	Rev. 29
MA-AA-716-010	Maintenance Planning (Constellation Proprietary)	Rev. 34

During the audit, the staff verified the applicant's claim that the "scope of program," "preventive actions," "parameters monitored or inspected," "detection of aging effects," "monitoring and trending," "acceptance criteria," and "corrective actions" program elements of the LRA AMP are consistent with the corresponding elements of the GALL-LR Report AMP.

The staff also audited the description of the Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components AMP provided in the FSAR supplement. The staff verified this description is consistent with the description provided in the SRP-LR.

LRA AMP B.2.1.26, Lubricating Oil Analysis

Summary of Information in the Application

The LRA states that AMP B.2.1.26, "Lubricating Oil Analysis," is an existing program with an enhancement that will be consistent with the program elements in GALL-LR Report AMP XI.M39, "Lubricating Oil Analysis." At the time of the audit, the applicant had not yet fully developed the documents necessary to implement this enhanced program, and the staff's audit addressed only the program elements described in the applicant's basis document.

Activities

During its audit, the staff reviewed documentation contained in the LRA and provided by the applicant via the ePortal. For the operating experience (OE) review, the applicant made a presentation on the process used to identify and evaluate the pertinent OE. Afterwards, the staff conducted its review of the applicant's methodology and OE by reviewing documentation contained in the LRA and ePortal. The table below lists the documents that were reviewed by the staff and were found relevant to the Lubricating Oil Analysis Program. The staff will document its review of relevant operating experience in the SE.

Document	Title	Revision / Date
CL-PBD-AMP.XI.M39	Lubricating Oil Analysis Program Basis Document	Rev. 1
Procedure CPS-8902.01	Oil Sampling	06/20/2012
Procedure MA-AA-716-230	Predictive Maintenance (Constellation Proprietary)	Rev. 12
Procedure MA-AA-716-230-1001	Oil Analysis Interpretation Guidelines (Constellation Proprietary)	Rev. 22
Procedure MA-AA-716-230-1004	Lubricating Sampling Guideline (Constellation Proprietary)	Rev. 5
NESD-S-MS-03.00	Oil Sampling and Analysis (Constellation Proprietary)	Rev. 33
WO 00157029	PMSR, Sample and Change Pump Bearing Oil 1E22C003, E:1E22C003, PMPA, P30	10/20/2020
IR-04284958	Elevated Cooper in 1B33C001B Motor Level Bearing Oil	11/03/2019
AR-0397133 Report	Need Oil Changed Based on Oil Condition of the Last Sample	03/10/2017

During the audit, the staff verified the applicant's claim that the "scope of program," "monitoring and trending," "acceptance criteria" and "corrective actions" program elements of the LRA AMP are consistent with the corresponding elements of the GALL-LR Report AMP.

During the audit, the staff verified applicant's claim that the "preventive actions," "parameters monitored or inspected" and "detection of aging effects" program elements of the LRA AMP will be consistent with the corresponding elements of the GALL-LR Report AMP after implementation of the identified enhancements.

The staff also audited the description of the LRA AMP Lubricating Oil Analysis Program provided in the FSAR supplement. The staff verified this description is consistent with the description provided in the SRP-LR Report.

LRA AMP B.2.1.27, Monitoring of Neutron-Absorbing Materials Other than Boraflex

Summary of Information in the Application

The LRA states that AMP B.2.1.27, "Monitoring of Neutron-Absorbing Materials Other than Boraflex," is an existing program with one enhancement that will be consistent with the program

elements in GALL-LR Report AMP XI.M40, “Monitoring of Neutron-Absorbing Materials Other than Boraflex.” To verify this claim of consistency, the staff audited the LRA AMP.

Audit Activities

The table below lists documents that were reviewed by the staff and were found relevant to the program. The staff will document its review of this information in the SE.

Document	Title	Revision / Date
CL-PBD-AMP-XI.M40	Clinton Power Station Unit 1 License Renewal Project Monitoring of Neutron-Absorbing Materials Other Than Boraflex	Rev.1
AR 00866262	Fuel Rack Coupon Tree Lessons Learned	01/13/2009
CPS 8118.01	Metamic Coupon Sampling and Testing Program(Constellation Proprietary)	Rev. 0c
NF-AA-600	Spent Fuel Management (Constellation Proprietary)	Rev. 9
NF-AA-610	On-Site Wet Storage of Spent Nuclear Fuel (Constellation Proprietary)	Rev. 16
WO 01046694	00179843-01, TSPR, Spent Fuel Metamic Coupon Sampling Program, W: Spent Fuel Coupons	01/30/2009
WO 01306257	00182114-02, TS, Perform Fuel Rack Coupon Sampling & Testing (2011, 1FH09J-03, E: 1FH09J, N/A,)	11/8/2011
WO 01708913	00182114-03, TS, Perform Fuel Rack Coupon Sampling & Testing (2015, 1FH09J-05, E: 1FH09J, N/A,)	10/20/2015
NET-28064-020-01	Inspection and Testing of Metamic Surveillance Coupons from Clinton Nuclear Power (Constellation Proprietary)	10/16/2019
N/A	Attachment 1 Item #8 (TRP-15) Enhancement #1 Additional Information	10/17/2024
EPRI 1021052	Overview of BORAL® Performance Based Upon Surveillance Coupon Measurements	12/2010
EPRI 1025204	Strategy for Managing the Long-Term Use of BORAL® in Spent Fuel Storage Pools	07/2012
EPRI 3002018496	Handbook of Neutron Absorber Materials for Spent Nuclear Fuel Storage and Transportation Applications, Revision 1	03/2022
HI-2033135	Criticality Safety Analysis for Clinton (Holtec Proprietary)	Rev. 5

During the audit, the staff verified the applicant’s claim that the “preventive actions,” and “corrective actions” program elements of the LRA AMP are consistent with the corresponding elements of the GALL-LR Report AMP.

In addition, the staff found that for the “scope of program,” “parameters monitored or inspected,” “detection of aging effects,” “monitoring and trending,” and “acceptance criteria,” program elements, sufficient information was not available to determine whether they will be consistent with the corresponding program elements of the GALL-LR Report AMP after implementation of the identified enhancements. The staff will consider issuing RAIs in order to obtain the information necessary to verify whether these program elements will be consistent with the corresponding program elements of the GALL-LR Report AMP after implementation of the identified enhancements.

The staff also audited the description of the Monitoring of Neutron-Absorbing Materials Other than Boraflex program provided in the FSAR supplement. The staff found that sufficient information was not available to determine whether the description provided in the FSAR supplement was an adequate description of the Monitoring of Neutron-Absorbing Materials Other than Boraflex program. The staff will consider issuing RAIs in order to obtain the information necessary to verify the sufficiency of the FSAR supplement program description.

LRA AMP B.2.1.28, Buried and Underground Piping and Tanks

Summary of Information in the Application

The LRA states that AMP B.2.1.28, “Buried and Underground Piping and Tanks,” is an existing program with enhancements and an exception that will be consistent with the program elements in GALL-LR Report AMP XI.M41, “Buried and Underground Piping and Tanks,” as modified by LR-ISG-2015-01, “Changes in Buried and Underground Piping and Tank Recommendations.” At the time of the audit, the applicant had not yet fully developed the documents necessary to implement this enhanced program, and the staff’s audit addressed only the program elements described in the applicant’s basis document.

Audit Activities

The table below lists documents that were reviewed by the staff and were found relevant to the program. The staff will document its review of this information in the SE.

Document	Title	Revision / Date
CL-PBD-AMP-XI.M41	Program Basis Document, Buried and Underground Piping and Tanks, GALL Program XI.M41 – Buried and Underground Piping and Tanks	Rev. 3
ER-AA-5400-1004	Cathodic Protection System Management Guide (Constellation Proprietary)	Rev. 2
ER-AA-5400-1002	Underground Piping and Tank Examination Guide (Constellation Proprietary)	Rev. 10
SA-AA-117	Excavation, Trenching, and Shoring (Constellation Proprietary)	Rev. 25
AR 04470591	Guided Wave Work not performed in Work Week 2201	01/04/2022
AR 01659501	UT Identifies Moderate Localized Corrosion on 1SX02AA-30	05/01/2014

Document	Title	Revision / Date
AR 04245827	1SX02AA: 100% UT Scan Needed Per BPRWCP	05/02/2019
WO 04978534	1SX02AA: 100% UT Scan Needed per BPRWCP	05/21/2020
AR 04554484	Annual Survey Report (2022) Recommendations	02/14/2023
2000604.401	CPS InTellusAS™ 2021 Annual Survey Report	03/02/2022
2200490.401	CPS InTellusAS™ 2022 Annual Survey Report	02/10/2023
ER-AA-5400	Buried Piping and Raw Water Integrity Management Programs (Constellation Proprietary)	Rev. 13
Form 276-C	Standard Specification for Protective Coatings for Buried Piping	01/20/1994
K-2942	Earthwork Clinton Power Station – Units 1 and 2 – Illinois Power Company	Amendment 10
S03-1140	Safety Related Backfill Clinton Power Station Illinois Power Company	Rev. P
CPS 3213.01	Fire Detection and Protection (Constellation Proprietary)	Rev. 33
CPS 9071.04	Fire Protection Water System Flow Test (Constellation Proprietary)	Rev. 35a
1893.01	CPS Administrative Requirements for Fire Protection (Constellation Proprietary)	Rev. 24

During the audit, the staff verified the applicant's claim that the "scope of program" and "monitoring and trending" program elements of the LRA AMP will be consistent with the corresponding elements of the GALL-LR Report AMP after implementation of the identified enhancements. In addition, the staff found that for the "preventive actions," "parameters monitored or inspected," "detection of aging effects," "acceptance criteria," and "corrective actions" program elements, sufficient information was not available to determine whether they were consistent with the corresponding program elements of the GALL-LR Report AMP. The staff will consider issuing RAIs in order to obtain the information necessary to verify whether these program elements are consistent with the corresponding program elements of the GALL-LR Report AMP.

The staff also audited the description of the LRA Buried and Underground Piping and Tanks program provided in the FSAR supplement. The staff found that sufficient information was not available to determine whether the description provided in the FSAR supplement was an adequate description of the LRA Buried and Underground Piping and Tanks program. The staff will consider issuing RAIs in order to obtain the information necessary to verify the sufficiency of the FSAR supplement program description.

LRA AMP B.2.1.29, ASME Section XI, Subsection IWE

Summary of Information in the Application

The LRA states that AMP B.2.1.29, "ASME Section XI, Subsection IWE," is an existing program which, with one enhancement, will be consistent with the program elements in GALL Report AMP XI.S1, "ASME Section XI, Subsection IWE."

Audit Activities

During its audit, the staff reviewed documentation contained in the LRA and provided by the applicant via the ePortal.

For the operating experience (OE) review, the applicant made a presentation on the process used to identify and evaluate the pertinent OE. Afterwards, the staff conducted its review of the applicant's methodology and operating experience by reviewing documentation contained in the LRA and ePortal.

The table below lists documents that were reviewed by the staff and were found relevant to the program. The staff will document its review of this information in the SE.

Document	Title	Revision / Date
CL-PBD-AMP-XI.S1	CPS Unit 1 License Renewal Project, Program Basis Document, ASME Section XI, Subsection IWE (GALL Program XI.S1)	Rev. 1
CL-AMRBD-MEAE	License Renewal Project – Materials, Environments, and Aging Effects – Aging Management Review Basis Document	Rev. 2
N/A	CPS License Renewal Application – Operating Experience Review Process Presentation	08/12/2024
N/A	Keyword Searches	04/4/2024
LR-AA-1609	Instruction – Aging Management Reviews (AMR), CPS License Renewal Project (Constellation Proprietary)	Rev. 1
LR-AA-1611	T&RM – Aging Management Program Basis Documents, CPS License Renewal Project (Constellation Proprietary)	Rev. 1
ER-AA-335-018	Procedure – Visual Examination of ASME IWE Class MC and Metallic Liners of Class CC Components (Constellation Proprietary)	Rev. 17
ER-AA-335-004	Procedure – Ultrasonic (UT) Measurement of Material Thickness and Interfering Conditions (Constellation Proprietary)	Rev. 10
ER-AA-380	Procedure – Primary Containment Leakrate Testing Program (Constellation Proprietary)	Rev. 18

Document	Title	Revision / Date
PI-AA-125	Corrective Action Program Procedure (Constellation Proprietary)	Rev. 9
PI-AA-120	Issue Identification and Screening Process (Constellation Proprietary)	Rev. 13
ER-AA-330	Procedure – Conduct of Inservice Inspection Activities (Constellation Proprietary)	Rev. 19
ER-AA-330-007	Procedure – Visual Examination of Section XI Class MC and Metallic Liners of Class CC Components (Constellation Proprietary)	Rev. 15
ER-AA-330-009	Procedure – ASME Section XI Repair/Replacement Program (Constellation Proprietary)	Rev. 18
ER-CL-330-001	Procedure – Containment IWE and IWL Inspection Acceptance Criteria (Constellation Proprietary)	Rev. 1
ISI-IWE/IWL CNTMNT INSP PROGRM	Containment Inservice Inspection (CISI) Program Plan – Third Ten-year Containment Inspection Interval, Clinton Power Station Unit 1 (09/10/18 to 09/09/28)	Rev. 8 (11/20/2018)
MA-AA-736-600	Procedure – Torquing and Tightening of Bolted Connections(Constellation Proprietary)	Rev. 14
MA-CL-736-6001	T&RM – Tightening of Flanged Connections (Constellation Proprietary)	Rev. 1
PES-S-003	Standard – In-Storage Maintenance of Nuclear Material (Constellation Proprietary)	Rev. 15
PES-S-010	Standard – Fasteners (Constellation Proprietary)	Rev. 5
AR02502259	Containment Wall Penetration Inspection Results	05/18/2015
AR02671728	NRC ISI: C1R15 Primary Containment Liner Corrosion	05/19/2016
AR 01040325	Containment Penetrations – Liner / Wall Degradation	03/09/2010
AR 02706215	NRC NCV 2016002-05 Lack of Acceptance Criteria for Containment Visual Examination	08/19/2016
AR 04077439	Evaluation of Containment Visual Inspection Indications Identified in C1R17	11/22/2017
C1R21-IWE-500A, -500B	ASME IWE (Class MC) Containment and IWL (Class CC) Metallic Liners Visual Examination NDE Report	09/21/2023
C1R21-IWE-501B, -502A, -503A, -510A, -520B, -527	ASME IWE (Class MC) Containment and IWL (Class CC) Metallic Liners Visual Examination NDE Report	09/24/2023
C1R21-IWE-502A, -503A, -508A, -509B, -512A, -513B, -	ASME IWE (Class MC) Containment and IWL (Class CC) Metallic Liners Visual Examination NDE Report	09/23/2023

Document	Title	Revision / Date
523A, -523B, -524B, -528		
C1R21-IWE-504, -505, -506, -507A, -509A,-514B, -516, -517A, -518, 519A, -520, -521, -522, -525	ASME IWE (Class MC) Containment and IWL (Class CC) Metallic Liners Visual Examination NDE Report	09/22/2023
C1R21-IWE-514B	ASME IWE (Class MC) Containment and IWL (Class CC) Metallic Liners Visual Examination NDE Report	09/27/2023
C1R21-IWE-530	ASME IWE (Class MC) Containment and IWL (Class CC) Metallic Liners Visual Examination NDE Report	10/03/2023
C1R21-IWE-531	ASME IWE (Class MC) Containment and IWL (Class CC) Metallic Liners Visual Examination NDE Report	10/04/2023
C1R19 ISI DOCS BOOK 3 Part 1, Part 2 & Part 3	ASME IWE (Class MC) Containment and IWL (Class CC) Metallic Liners Visual Examination NDE Reports for Outage C1R19	09/25/2019 – 10/14/2019

During the audit, the staff verified the applicant's claim that the "scope of program," "preventive actions," "parameters monitored or inspected," "detection of aging effects," "monitoring and trending," and "acceptance criteria" and "corrective actions" program elements of the LRA AMP are consistent, or with enhancement will be consistent, with the corresponding elements of the GALL Report AMP.

During the audit, the staff made the following observation:

- The staff reviewed Procedure ER-AA-335-018, Revision 17, Attachment 3 "ASME IWE Class MC Containment and Metallic Liners of Class CC Components Visual Examination NDE Report" and noted that it included "arc strikes" as an attribute inspected for. However, element 3 in the program basis document (PBD) CL-PBD-AMP-XI.S1, Revision 1, did not appear to include arc strikes as a parameter monitored.

The staff may consider issuing RAI(s) or use a voluntary update to the PBD offered by the applicant to address the above observation.

The staff also audited the description of the LRA AMP "ASME Section XI, Subsection IWE" provided in the FSAR supplement A.2.1.29. The staff verified this description is consistent with the description provided in the SRP-SLR.

LRA AMP B.2.1.30, ASME Section XI, Subsection IWL

Summary of Information in the Application

The LRA states that AMP B.2.1.30, "ASME Section XI, Subsection IWL," is an existing program that is consistent with the program elements in GALL-LR Report AMP XI.S2, "ASME Section XI, Subsection IWL."

Audit Activities

In addition to the OE documentation contained in the LRA and ePortal, the staff observed the applicant's search of its operating experience database using the keywords.

The table below lists documents that were reviewed by the staff and were found relevant to the program. The staff will document its review of this information in the SE.

Document	Title	Revision / Date
CL-PBD-AMP-XI.S2	Program Basis Document – ASME Section XI, Subsection IWL	Rev. 1
ER-AA-330-001	Containment IWE and IWL Inspection Acceptance Criteria (Constellation Proprietary)	Rev. 1
ER-AA-330-005	Visual Examination of Section XI Class CC Concrete Containment Structures (Constellation Proprietary)	Rev. 16
ER-AA-335-019	Visual Examination of ASME IWL Class CC Containment Components (Constellation Proprietary)	Rev. 3
WO 01703749	Need WO for C1R15 CISI Inspections	10/26/2015
AR 02502259	Containment Wall Penetration Inspections Results	05/18/2015
WO 01588367	Complete CISI Inspection Documentation Reviews	03/27/2014
WO 04835791	Perform Containment dbr Inspections	05/29/2019
AR 04175323	Containment Walkdown Deficiencies Identified	09/20/2018

During the audit, the staff verified the applicant's claim that the "scope of program," "preventive actions," "parameters monitored or inspected," "detection of aging effects," "monitoring and trending," "acceptance criteria," and "corrective actions" program elements of the LRA AMP are consistent with the corresponding elements of the GALL-LR Report AMP.

The staff also audited the description of the LRA AMP ASME Section XI, Subsection IWL program provided in the FSAR supplement. The staff verified this description is consistent with the description provided in the SRP-LR.

LRA AMP B.2.1.31, ASME Section XI, Subsection IWF

Summary of Information in the Application

The LRA states that AMP B.2.1.31 "ASME Section XI, Subsection IWF," is an existing program, with enhancements when implemented, will be consistent with the program elements in GALL-LR Report, Revision 2, AMP XI.S3, "ASME Section XI, Subsection IWF."

Audit Activities

During its audit, the staff interviewed the applicant's staff and reviewed documentation contained in the LRA and ePortal.

For the operating experience (OE) review, the applicant made a presentation on the process used to identify and evaluate the pertinent OE. Afterwards, the staff conducted its review of the applicant's methodology and OE by reviewing documentation contained in the LRA and ePortal.

The table below lists documents that were reviewed by the staff and were found relevant to the program. The staff will document its review of this information in the SE.

Document	Title	Revision/Date
CL-PBD-AMP-XI.S3	CPS Unit 1 License Renewal Project, Program Basis Document, ASME Section XI, Subsection IWF (GALL Program XI.S3)	Rev. 1
N/A	CPS License Renewal Application – Operating Experience Review Process Presentation	08/12/2024
N/A	Keyword Searches	04/04/2024
ER-AA-335-016	Procedure - VT-3 Visual Examination of Component Supports, Attachments and Interiors of Reactor Vessels (Constellation Proprietary)	Rev. 14
ER-AA-330	Procedure - Conduct of Inservice Inspection Activities (Constellation Proprietary)	Rev. 19_markup
ER-AA-330-003	Procedure – Inservice Inspection of Section XI Component Supports (Constellation Proprietary)	Rev. 17_markup
ER-CL-330-1001	ISI Program Plan – Fourth Ten-Year Inspection Interval (07/01/2020 to 06/30/2030), Clinton Power Station, Unit 1 (Constellation Proprietary)	Rev. 0_markup (06/01/2020)
ER-CL-330-1003	ISI Selection Document, Fourth Ten-Year Inspection Interval, Clinton Power Station, Unit 1 (Constellation Proprietary)	Rev. 1_markup (05/17/2023)
MA-AA-736-600	Procedure – Torquing and Tightening of Bolted Connections (Constellation Proprietary)	Rev. 14_markup
MA-CL-736-6001	T&RM – Tightening of Flanged Connections (Constellation Proprietary)	Rev. 1_markup
CC-AA-102	Design Input and Configuration Change Impact (Constellation Proprietary)	Rev. 34_markup
PES-S-003	Standard - In-Storage Maintenance of Nuclear Material (Constellation Proprietary)	Rev. 15_markup
PES-S-010	Standard – Fasteners (Constellation Proprietary)	Rev. 5_markup
AR 2741864	CIA (EN) Pre-NRC ISIS IP 71111.08G Inspection	11/16/2016
AR 2741874	Self Assessment – ISI Program Preparedness to C1R18 NRC Inspection	03/20/2018
AR 04283253	VT-3 Identified a Loose Locknut/Jam Nut on 1SX09019R	09/29/2019
AR 044492263	VT-3 Identified a Loose Jam Nut on Variable Spring Support 1H101C(A)	09/29/2021
WO 01353486	C1R13 – Perform ISI Examinations	04/26/2011

Document	Title	Revision/Date
WO 1353486-03 & WO 1353486 Supplement	RPV Support Skirt Support Components – Examination Summary, C1R13 Outage	12/06/2011
WO 05103978	C1R20 ISI Contingency Repair/Replacement/Hanger Adjustments (Tighten Jam Nut)	10/26/2022
AR 04450991	C1R20 – Hangers Setting Not Meeting Acceptance Criteria (MS Variable Component Supports 1H101A(A), 1H101C(A), 1H01C(B), 1H02C	10/05/2021
EC 0000635266	C1R20 Evaluation of VT-3 As-Found Setting for Spring Hangers (MS System 1H101A(A), 1H101C(A), 1H01C(B), 1H02C and RR System 1H305A and 1H306A	10/28/2021
AR 04451767	C1R20 –Hanger, 1SX20001V Setting Not Meeting the Criteria (Shutdown Service Water System)	10/08/2021
AR 04451783	C1R20 Hanger, 1RH07084V Setting Not Meeting the Criteria	10/08/2021
EC 0000635274	C1R20 Evaluation of VT-3 As-Found Setting for Spring Hangers 1RH07084V and 1SX20001V	10/28/2021
EC 0000639807	C1R21 Evaluation of VT-3 As-Found Setting for Spring Hangers (MS system 1H101B(B); RR system: 1H305B and 1H306B)	10/23/2023

During the audit, the staff verified the applicant's claim that the "parameters monitored or inspected," "detection of aging effects," "acceptance criteria," and "corrective actions" program elements of the LRA AMP are or will be consistent with the corresponding elements of the GALL-LR Report AMP XI.S3 after implementation of the identified enhancements.

In addition, the staff found that for the "scope of program (e.g., elastomeric vibration isolation elements)," "preventive actions," and "monitoring and trending" program elements, sufficient information was not available to determine whether they were consistent with the corresponding program elements of the GALL-LR Report AMP. The staff will consider issuing RAIs or use a voluntary LRA supplement to obtain the information necessary to verify whether these program elements are consistent with the corresponding program elements of the GALL-LR Report.

The staff also audited the AMR line items related to the ASME Section XI, Subsection IWF AMP.

During the audit, the staff made the following observations:

- The staff reviewed Engineering Change (EC) 0000635266, EC 0000635274 and EC 0000639807, and noted these ECs evaluated as-found setting of variable support spring hangers not meeting the specified tolerance criteria (5%) and determined that the as-found settings were within the working range limits specified in the manufacturer's catalog, and therefore the associated piping stress would remain within acceptable limits. The as-found setting was thus accepted without requiring corrective measures. Of the ARs reviewed, the staff did not find any instance where scope expansion was performed based on conditions found.

- The staff reviewed the IWF AMP PBD CL-PBD-AMP-XI.S3, and implementing procedures CC-AA-102 and MA-AA-736-600 and noted that high-strength bolting (HSB) in sizes greater than 1-inch nominal diameter is not and will not be used in IWF supports in the future. The staff also noted from the PBD that plant-specific OE has not identified cracking due to SCC for HSB.

- The staff reviewed implementing procedures CC-AA-102, MA-AA-736-600 and references therein and noted that the limit sulfur in chemicals such as lubricants in the plant, so that lubricants with sulfur as an ingredient are not used. However, a statement from the PBD may be needed in the LRA that structural bolting is procured with a light residual coating of oil and installed without lubricant, and that additional thread lubricant (including MoS2) is not used for IWF support structural bolting.

- The staff reviewed LRA Table 3.5.1, AMR item 3.5.1-57 and corresponding Table 2 items, and noted a lack of clarity with regard to components for the item using note E.

- The staff noted from review of the LRA that regarding Table 3.5.1 AMR line item 3.5.1- 83 and corresponding Table 2 item for structural bolting of Class 2 and 3 component supports bolting in a water-flowing environment, sufficient information was not provided of whether the component and environment is included in the selected inspection sample of the IWFAMP.

- The staff noted from review of the LRA that regarding Table 3.5.1 AMR line item 3.5.1- 84 and corresponding Table 2 item for stainless steel drywell head closure bolting with generic note E, sufficient information was not provided to justify the adequacy of the alternate One-Time Inspection AMP being used in lieu of the GALL-LR recommended AMP.

- The staff reviewed LRA Table 3.5.1, AMR item 3.5.1-94 and noted lack of clarity regarding consistency claim given that based on the PBD, there are no vibration isolation elements in CPS IWF supports.

- The staff reviewed LRA Table 3.5.1, AMR item 3.5.1-74 (TRP 89) and noted the non-applicability claim for the item was not adequately justified or not appropriate.

The staff will consider issuing RAIs or use a voluntary LRA supplement to obtain the information necessary to make its finding regarding the issues in the latter three observations above.

The staff also audited the description of the LRA AMP “ASME Section XI, Subsection IWF” provided in the FSAR supplement Section A.2.1.31. The staff found that sufficient information was not available to determine whether the description provided in the FSAR supplement was an adequate description of the LRA AMP ASME Section XI, Subsection IWF. The staff will consider issuing an RAI or use a voluntary LRA supplement in order to obtain the information necessary to verify the sufficiency of the FSAR supplement program description.

LRA AMP B.2.1.32, 10 CFR Part 50, Appendix J

Summary of Information in the Application

The LRA states that AMP B.2.1.32, "10 CFR Part 50, Appendix J," is an existing program that is consistent with the program elements in GALL-LR Report AMP XI.S4, "10 CFR Part 50, Appendix J."

Audit Activities

In addition to the OE documentation contained in the LRA and ePortal, the staff observed the applicant's search of its operating experience database using the keyword: ("leak," "equipment hatch," "pressures boundary," and "penetration.")

The table below lists documents that were reviewed by the staff and were found relevant to the program. The staff will document its review of this information in the SE.

Document	Title	Revision / Date
CL-PBD-AMP-XI.S4	Clinton Power Station, Unit 1 License Renewal Project 10 CFR Part 50, Appendix J	Rev. 1
AR 04473677-07	Clinton Power Station Appendix J FASA	Rev. 7
IR 2501534	(PSU) LLRT 1VQ006A-B AND 1VQ00A-B EXCESSIVE LEAKAGE MC102	05/12/2015
IR 4280979	C1R19 CP DELAY MSIV LEAKAGE HIGHER THAN EXPECTED	09/20/2019
ER-AA-380	Primary Containment Leakrate Testing Program (Constellation Proprietary)	Rev. 17
EC 402151	Evaluation of VQ LLRT Exceeds Evaluation Limit	05/20/2015
CPS 1305.01	Primary Containment Leak Rate Testing Program (Constellation Proprietary)	08/15/2019
CPS 9861.01	Integrated Leak Rate Test (Constellation Proprietary)	08/18/2023
CPS 9861.02	Local Leak Rate Testing Requirements and Type C(Air) Local Leak Rate Testing (Constellation Proprietary)	07/09/2012
CPS 9861.03	Type B Local Leak Rate Testing (Constellation Proprietary)	07/09/2012
CPS 9861.04	MSIV Local Leak Rate Testing (Constellation Proprietary)	07/09/2012
CPS 9861.05	Water Local Leak Rate Testing (Constellation Proprietary)	07/09/2012

During the audit, the staff verified the applicant's claim that the "scope of program," "preventive actions," "parameters monitored or inspected," "detection of aging effects," "monitoring and

trending," "acceptance criteria," and "corrective actions" program elements of the LRA AMP are consistent with the corresponding element of the GALL-LR Report AMP.

The staff also audited the description of the LRA AMP A.2.1.32, 10 CFR Part 50, Appendix J provided in the FSAR supplement. The staff verified this description is consistent with the description provided in the SRP-LR.

LRA AMP B.2.1.33 Masonry Walls

Summary of Information in the Application

The LRA states that AMP B.2.1.33, "Masonry Walls," is an existing program that is consistent with the program elements in GALL-LR Report AMP XI.S5, "Masonry Walls."

Audit Activities

In addition to the OE documentation contained in the LRA and ePortal, the staff observed the applicant's search of its operating experience database using the keywords: ("gap," "crack," "grout," "CMU," "block," and "mortar.")

The table below lists documents that were reviewed by the staff and were found relevant to the program. The staff will document its review of this information in the SE. An on-site audit was performed September 10, 2024 to September 12, 2024.

Document	Title	Revision / Date
CL-PBD-AMP-XI.S5	PROGRAM BASIS DOCUMENT, CL-PBD-AMP-XI.S5 - Masonry Walls	Rev. 2
ER-AA-450	STRUCTURES MONITORING (Constellation Proprietary)	Rev. 11
ER-CL-450-1006	CLINTON STRUCTURES MONTORING INSTRUCTIONS (Constellation Proprietary)	Rev. 2
AR 4162907	10 CFR 50.65 (a)(3) Periodic Assessment of Maintenance Rule Program	05/21/2018
AR 04287793	NOS ID GAP ID'd in wall in the Aux Electrical Equipment Room	10/14/2019
AR 00764743	EARTHQUAKE OFF-NORMAL ENTRY	04/18/2008
WO 04974611	NOS ID GAP ID'D IN WALL IN AUX ELECTRICAL EQUIPMENT ROOM	11/12/2019

During the audit, the staff verified the applicant's claim that the "scope of program," "preventive actions," "parameters monitored or inspected," "detection of aging effects," "monitoring and trending," "acceptance criteria," and "corrective actions" program elements of the LRA AMP are consistent with the corresponding elements of the GALL-LR Report AMP.

The staff also audited the description of the LRA A.2.1.33, "Masonry Walls," in the FSAR supplement. The staff verified this description is consistent with the description provided in the SRP-LR.

LRA AMP B.2.1.34, Structures Monitoring

Summary of Information in the Application

The LRA states that AMP B.2.1.34, “Structures Monitoring,” is an existing program with enhancements that will be consistent with the program elements in GALL-LR Report AMP XI.S6, “Structures Monitoring.”

Audit Activities

In addition to the OE documentation contained in the LRA and ePortal, the staff observed the applicant’s search of its operating experience database using the keywords. An on-site audit was performed from September 10, 2024 to September 12, 2024.

The table below lists documents that were reviewed by the staff and were found relevant to the program. The staff will document its review of this information in the SE.

Document	Title	Revision / Date
CL-PBD-AMP-XI.S6	Program Basis Document, GALL Program XI.S6 - Structures Monitoring	Rev. 2
AR 4162907-10	10 CFR 50.65(a)(3) Periodic Assessment of Maintenance Rule Program, Clinton Power Station, 5/30/2017 through 5/21/2018	07/18/2018
ATI 1297234-04	NRC IN 2011-20, Significance Level 3 OPEX Evaluation, “Concrete Degradation by Alkali-Silica Reaction”	02/14/2012
IR 0888041	Stairways Handrail Post Are Rusted at Connect & Weld Missing	03/03/2009
IR 1197979	IER - Flood Seals Do Not Have Periodic Inspection Program	04/05/2011
IR 1197979-02	Engineering Response for the Flood Seal Inspection Requirements	09/15/2011
IR 2404234	Trees Grown Near Diesel Generator (DG) Building Wall (Outside of DG Building)	10/31/2014
IR 3973954	NRC NCV 2016004-01 Failed to Ensure Flood Seals Controlled	02/14/2017
ER-AA-450	Structures Monitoring Procedure (Constellation Proprietary)	Rev. 11
ER-CL-450-100	Clinton Structures Monitoring Program (Constellation Proprietary)	Rev. DRAFT
ER-CL-450-1006	Clinton Structures Monitoring Instructions (Constellation Proprietary)	Rev. 1
MA-AA-736-600	Torquing and Tightening of Bolted Connections (Constellation Proprietary)	Rev. 14
PM-N/A	Ground Water Analysis and Assessment Impact of Changes on Below Grade Structures	N/A
PM 178804-01	Modify Structures Monitoring Outage PM License Renewal	N/A
PM 178804-02	Modify Structures Monitoring Online PM for License Renewal	N/A

Document	Title	Revision / Date
WO 983870-01	Perform Structures Monitoring Inspections During Plant Online	03/18/2009
Letter Y-109621	Maintenance Rule Program - Structures Monitoring Assessment	02/03/2009
WO 04829184-01	Perform Plant Structures Monitoring Inspections Online	04/26/2019
Letter Y-109831	Maintenance Rule Program - Structures Monitoring Assessment	04/26/2019
AR 04234366	ICM076 Support Members Uncoated and Rusts Observed	03/29/2019
AR 04239727	Efflorescence Built-Up on Screen House Tunnel West Wall	04/15/2019
AR 04239985	Efflorescence and Rusts Observed on Embed Plate at Fuel Building	04/16/2019
AR 04240000	Outdoor-Concrete Spalling from Foundation of Make-up Water Pump House (MWPH) Tank	04/16/2019
WO 05307812-01	Maintenance Rule Program - Structures Monitoring Assessment	04/26/2024
AR 04779087	Concrete Spalling from Firewater Storage Tank (FWST) at MWPH	06/06/2024
AR 04779092	Concrete Spalling at Exterior Screen House Deck	06/06/2024
AR 04779408	Concrete Spalling Turbine Building 781	06/07/2024
AR 04779807	Support Corrosion	06/10/2024
WO 5114395-01	Visual Inspection of Cable Trays and Supports at Vault (OSHC-1 D)	N/A

During the audit, the staff verified the applicant's claim that the "preventive actions," "monitoring and trending," and "corrective actions" program elements of the LRA AMP are consistent with the corresponding elements of the GALL-LR Report AMP. In addition, the staff found that for the "scope of program," "parameters monitored or inspected," "detection of aging effect," and "acceptance criteria" program elements, sufficient information was not available to determine whether they were consistent with the corresponding program elements of the GALL-LR Report AMP. The staff will consider issuing RAIs in order to obtain the information necessary to verify whether these program elements are consistent with the corresponding program elements of the GALL-LR Report AMP.

During the audit, the staff made the following observations:

- The staff noted in Enhancement No. 2 to the "Scope of Program" program element that several SCs identified in the LRA as within the scope of the AMP (for instance as metal decking) were not clearly identified in the Structural Commodity Group (Section 2.4.11), Table 2.4-11, and Table 3.5.2-11.

- The staff noted in Enhancements 6 and 7 to the "Acceptance Criteria" program element that the applicant did not include acceptance criteria for accessible sliding surfaces and elastomeric vibration isolators.

- The staff noted in Enhancement 8 to the “Acceptance Criteria” program element that the wording “not subject to stress corrosion cracking” used for defining high strength bolts is inconsistent with the GALL-LR XI.S6 AMP.

During the on-site audit, the staff performed walkdowns of the primary containment, control building, auxiliary building, fuel building, turbine building, screen house and yard structures. The staff made the following observations during walkdowns:

- During the walkdown of the Turbine Building and Auxiliary Building, the staff noted some vertical cracks on the inside of exterior reinforced concrete walls.

- During the walkdown of the cable tray supports within vaults, the staff noted that large amount of corrosion on the cable tray supports within vault C.

The staff also audited the description of the LRA Structures Monitoring program provided in the FSAR supplement. The staff verified this description is consistent with the description provided in the SRP-LR.

LRA AMP B.2.1.35, RG 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants

Summary of Information in the Application

The LRA states that AMP B.2.1.35, “RG 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants,” is an existing program with enhancements that will be consistent with the program elements in GALL-LR Report AMP XI.S7, “RG 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants.”

Audit Activities

In addition to the OE documentation contained in the LRA and ePortal, the staff observed the applicant’s search of its operating experience database using the keywords. An on-site audit was performed from September 10, 2024, to September 12, 2024.

The table below lists documents that were reviewed by the staff and were found relevant to the program. The staff will document its review of this information in the SE.

Document	Title	Revision / Date
CL-PBD-AMP-XI.S7	Program Basis Document, RG 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants	Rev. 2
ML24092A344	Clinton Power Station Final Safety Analysis Report	Rev. 23
AR 02405990	Clinton Ultimate Heat Sink Issue Report In Response to Braidwood Generating Station Ultimate Heat Sink Issue-Tracking Purpose	11/03/2014
AR 02446783	Technical Specification Compliance Issue Regarding Heat Sink Level	02/03/2015

Document	Title	Revision / Date
CC-AA-102	Design Input and Configuration Change Impact Screening (Constellation Proprietary)	Rev. 34
ER-AA-450	Structures Monitoring (Constellation Proprietary)	Rev. 11
ER-CL-450-100	Clinton Structures Monitoring Program (Constellation Proprietary)	Rev. DRAFT
ER-CL-450-1006	Clinton Structures Monitoring Instructions (Constellation Proprietary)	Rev. 2
ER-CL-450-2002	Ultimate Heat Sink Monitoring (Constellation Proprietary)	Rev. 1
MA-AA-736-600	Torquing and Tightening of Bolted Connections (Constellation Proprietary)	Rev. 14
PES-S-003	In-Storage of Maintenance of Nuclear Material (Constellation Proprietary)	Rev. 15
PES-S-010	Fasteners (Constellation Proprietary)	Rev. 5
WO 05011184-01	Verify Ultimate Heat Sink Monitoring Report Review	02/04/2021
WO 05130047-01	Verify Ultimate Heat Sink Monitoring Report Review	02/09/2022
S04-1094	Ultimate Heat Sink Plan	Rev. F
S04-1095	Ultimate Heat Sink Sections	Rev. D
S04-1101	Ultimate Heat Sink Dam Abutments Plan & Sections	Rev. G
S20-1117	Ultimate Heat Sink Discharge Structure Plan & Sections	Rev. C
S22-1001	Circulating Water Screen House Foundation Plan	Rev. M
S22-1012	Circulating Water Screen House Section & Details – Sheet 4	Rev. Y
C99-UHS-23(02-10) Y-109903	Submittal of 2022 Records for Ultimate Heat Sink Monitoring Program	2022
C99-UHS-24(06-13) Y-109917	Submittal of 2023 Records for Ultimate Heat Sink Monitoring Program	2023
CPS 2400.01	Circulating Water Screenhouse (CWSH) Intake Structure Inspection (Constellation Proprietary)	Rev. 9
CPS 9801.01	Ultimate Heat Sink Monitoring Report Review (Constellation Proprietary)	Rev. 24
EN-AA-405	Dike and Dam Maintenance (Constellation Proprietary)	Rev. 2
IR 04779092	Concrete Spalling at Exterior Screen House Deck	06/06/2024
IR 04239727	Efflorescence Built-Up on Screen House Tunnel West Wall	04/15/2019

During the audit, the staff verified the applicant's claim that the "scope of program," "preventive actions," and "corrective actions" program element(s) of the LRA AMP are consistent with the corresponding element(s) of the GALL-LR Report AMP. In addition, the staff found that for the "parameters monitored or inspected," "detection of aging effects," "monitoring and trending," and "acceptance criteria" program elements, sufficient information was not available to determine whether they were consistent with the corresponding program elements of the GALL-LR Report AMP. The staff will consider issuing RAI(s) in order to obtain the information necessary to verify whether these program elements are consistent with the corresponding program elements of the GALL-LR Report AMP.
During the audit, the staff made the following observations:

- The staff noted in LRA Section B.2.1.35 that inspection frequencies for the Water-Control Structures are not clearly specified.

- The staff noted in Enhancement 3 to the "Acceptance Criteria" program element that acceptance criteria for the cooling lake baffle dike are not clearly stated.

- The staff noted that it is not clarified whether Enhancement 8 in LRA Section B.2.1.34 is also applicable to the Water-Control Structures.

- The staff noted that the environments specified in Discussion for LRA Table 3.5.1, AMR item 3.5.1-83 are not consistent with those associated with Table 2 AMR items.

The staff made the following observations during walkdowns:

- During the walkdown of the Screen House, the staff did not find any significant degradations of the structure. During the discussion with Clinton Power Station (CPS) personnel after the walkdown, the staff noted that, for inspections of underwater structures, CPS ceased to employ divers and instead started using multi-beam sonar equipment in 2020. The staff reviewed color images of the underwater structures (which were generated from the multi-beam sonar inspection data) in 2023 Records for Ultimate Heat Sink Monitoring Program.

The staff also audited the description of the LRA RG 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants program provided in the FSAR supplement. The staff verified this description is consistent with the description provided in the SRP-LR.

LRA AMP B.2.1.36, Protective Coating Monitoring and Maintenance Program

Summary of Information in the Application

The LRA states that AMP B.2.1.36, "Protective Coating Monitoring and Maintenance Program," is an existing program that is consistent with the program elements in GALL-LR Report AMP XI.S8, "Protective Coating Monitoring and Maintenance Program."

Audit Activities

The table below lists documents that were reviewed by the staff and were found relevant to the program. The staff will document its review of this information in the SE.

Document	Title	Revision / Date
CL-PBD-AMP-XI.S8	Program Basis Document	Rev 1
AR 04556773	Action Request: Updated Cumulative Dose Values	02/23/23
AR 4026605-04	Coatings Program Check-In Self-Assessment	Rev 2
EC 639604	Containment Coatings ECCS Margin	Rev 0
ER-AA-330-003	Inservice Inspection of Section XI Component (Constellation Proprietary)Supports	Rev 17
ER-AA-335-001	Qualification and Certification of Nondestructive Examination (NDE) Personnel (Constellation Proprietary)	Rev 13
Y-109802	Unqualified & Degraded Field Walkdown Coatings List	05/09/17
CC-AA-205	Control of Undocumented/Unqualified Coatings Inside the Containment (Constellation Proprietary)	Rev 13
ER-AA-330-008	Safety-Related (Service Level I) Protective Coatings (Constellation Proprietary)	Rev 16
1080.01	CPS Protective Coating Program (Constellation Proprietary)	09/05/2014
8901.08	Field Coatings (Constellation Proprietary)	Rev 13A
PM 00158471-15	Containment Coatings To Be Inspected (FSAR)	N/A
PM 00158471-17	Drywell Coatings Inspection After Each Operating Cycle (FSAR)	N/A
WO 01556791	Degraded Coatings/Rusts On Liner Plates Inside Containment	12/02/2013
WO 01871985	Inspect Containment Coatings Each Operating Cycle	05/22/2017

During the audit, the staff verified the applicant's claim that the "scope of program," "preventive actions," "parameters monitored or inspected," "detection of aging effects," "monitoring and trending," "acceptance criteria," and "corrective actions" program elements of the LRA AMP are consistent with the corresponding elements of the GALL-LR Report AMP.

The staff also audited the description of the Protective Coating Monitoring and Maintenance AMP provided in the FSAR supplement. The staff verified this description is consistent with the description provided in the SRP-LR.

LRA AMP B.2.1.37, Insulation Material for Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements

Summary of Information in the Application.

The LRA notes that AMP B.2.1.37, “Insulation Material for Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements,” is a new program that will be consistent with the program elements in GALL-LR Report AMP XI.E1, “Insulation Material for Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements.” At the time of the audit, the applicant had not yet fully developed the documents necessary to implement this new program, and the staff’s audit addressed only the applicant’s basis document, available procedures, and referenced documents.

Audit Activities.

An on-site audit was performed September 10 to September 12, 2024.

The table below lists documents that were reviewed by the staff and were found relevant to the program. The staff will document its review of this information in the SE.

Document	Title	Revision / Date
CL-PBD-AMP-XI.E1	Program Basis Document	Revision 1
Markup MA-AA-723-500	Inspection of Non EQ cables and Connections For Managing Adverse Localized Environments (Constellation Proprietary)	Revision 13
Markup MA-AA-723-500	Attachment 4 Bounding Plant Location Temperature Values Table 7 (Clinton) (Constellation Proprietary)	not available
AR 1569643	IPB5199 Opened and Cables Found with Insulation Cracked	10/08/2013 (event date)
OP-AA-106-101-1006	Attachment B Issue Resolution Documentation Form (associated with IR #: 1569643) (Constellation Proprietary)	10/10/2013 (Revision 12)
NE-22-15-02	Non-EQ Insulated Cable and Connection Inspection Report	Revision 0
NE-22-15-1	Clinton Power Station Unit 1 XI.E1 Non-EQ Cable and Connection Program Preliminary Non-Outage Report	Revision 0
Enercon	Cable Tray White Paper	8-14-2017
Enercon	Cable Tray White Paper - Outage	8-14-2017
WO 01657442 Part 1	Clinton Cable Inspection	9/10/2013
WO 01657442 Part 2	Record Content Notification	not available

During the audit, the staff verified the applicant's claim that the "scope of program," "preventive actions," "parameters monitored or inspected," "detection of aging effects," "monitoring and trending," "acceptance criteria," and "corrective actions" program elements of the LRA AMP are consistent with the corresponding elements of the GALL-LR Report AMP.

During the audit, the staff made the following observations:

- During its review of CPS LRA AMP B.2.1.37, the staff identified that the program description of the AMP was not consistent with the corresponding element in GALL-SLR Report AMP XI.E5. Specifically, the program description element for AMP B.2.1.37 did not include an integrated approach for identifying adverse localized environments (ALE) at CPS. In response to the staff's breakout questions, the applicant provided a markup of the program description of LRA AMP B.2.1.37 to include CPS integrated approach for identifying ALE. The applicant will submit the revised program description of LRA AMP B.2.1.37 for consistency with GALL-LR Report AMP XI.E1 in a future supplement.

The staff also audited the description of the LRA Insulation Material for Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements provided in the FSAR supplement. The staff verified this description is consistent with the description provided in the SRP-LR.

LRA AMP B.2.1.38, Insulation Material for Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Used in Instrumentation Circuits

Summary of Information in the Application

The LRA notes that AMP B.2.1.38, "Insulation Material for Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Used in Instrumentation Circuits," is a new program that will be consistent with the program elements in GALL-LR Report AMP XI.E2, "Insulation Material for Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Used in Instrumentation Circuits." At the time of the audit, the applicant had not yet fully developed the documents necessary to implement this new program, and the staff's audit addressed only the applicant's basis document, available procedures, and referenced documents.

Audit Activities

An on-site audit was performed September 10 to September 12, 2024.

The table below lists documents that were reviewed by the staff and were found relevant to the program. The staff will document its review of this information in the SE.

Document	Title	Revision / Date
CL-PBD-AMP-XI.E2	Program Basis Document Insulation Material for Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Used in Instrumentation Circuits	Rev. 1
ER-AA-300-150	Cable Condition Monitoring Program (Markup) (Constellation Proprietary)	Rev. 8
CPS 8731.12	Neutron Monitoring Detector Testing (Markup) (Constellation Proprietary)	Rev. 11
CPS 9437.60A	Main Control Room Air Intake Radiation 1RIX-PR009A Channel Calibration (Markup) (Constellation Proprietary)	Rev.0c
CPS 9437.60B	Main Control Room Air Intake Radiation 1RIX-PR009B Channel Calibration (Markup) (Constellation Proprietary)	Rev.0e
CPS 9437.60C	Main Control Room Air Intake Radiation 1RIX-PR009C Channel Calibration (Markup) (Constellation Proprietary)	Rev. 0e
CPS 9437.60D	Main Control Room Air Intake Radiation 1RIX-PR009D Channel Calibration (Markup) (Constellation Proprietary)	Rev. 0e
CPS 9437.64A	Accident Range Stack Monitor (AXM) 0RIX-PR008 Channel Calibration (Markup) (Constellation Proprietary)	Rev. 0b
CPS 9437.64B	Accident Range Stack Monitor (AX) 0RIX-PR012 Channel Calibration (Markup) (Constellation Proprietary)	Rev. 0b
WO 01496377	IRM G Spiking	12/12/2011
WO 01773711	High Range Detector Failed PM on 0RIX-PR008	10/01/2014
WO 05223790	IRIX-PR009C Degraded Cabling	3/13/2024
IR #: 04548088	PM Modification Request (PMMR): LR AMP.XI.E2 10 Year Trend of Results	not available
IR #: 04548088	PM Modification Request (PMMR): Perform TDR, I/V Plot, and CDT on SRM Detectors	not available

During the audit, the staff verified the applicant's claim that the "scope of program," "preventive actions," "parameters monitored or inspected," "detection of aging effects," "monitoring and trending," "acceptance criteria," and "corrective actions" program elements of the LRA AMP are consistent with the corresponding elements of the GALL-LR Report AMP.

The staff also audited the description of the LRA Insulation Material for Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Used in

Instrumentation Circuits provided in the FSAR Supplement. The staff verified this description is consistent with the description provided in the SRP-LR.

LRA AMP B.2.1.39, Inaccessible Power Cables Not Subject to 10 CFR 50.49 Environmental Qualification Requirements

Summary of Information in the Application

The LRA notes that AMP B.2.1.39, "Inaccessible Power Cables Not Subject to 10 CFR 50.49 Environmental Qualification Requirements," is a new program with exception that will be consistent with the program elements in GALL-LR Report AMP XI.E3, "Inaccessible Power Cables Not Subject to 10 CFR 50.49 Environmental Qualification Requirements." At the time of the audit, the applicant had not yet fully developed the documents necessary to implement this new program, and the staff's audit addressed only the applicant's basis document, available procedures, and referenced documents.

Audit Activities

An on-site audit was performed September 10 to September 12, 2024.

The table below lists documents that were reviewed by the staff and were found relevant to the program. The staff will document its review of this information in the SE.

Document	Title	Revision / Date
CL-PBD-AMP-XI.E3	Program Basis Document: Inaccessible Power Cables Not Subject to 10 CFR 50.49 Environmental Qualification Requirements	Rev. 1
OP-AA-108-111-1001	Severe Weather and Natural Disaster Guidelines (Markup) (Constellation Proprietary)	Rev. 24
ER-AA-300-150	Cable Condition Monitoring Program (Markup) (Constellation Proprietary)	Rev. 8
MA-AA-723-330	Electrical Testing of AC Motors Using Baker Instrument Advanced Winding Analyzer (Markup) (Constellation Proprietary)	Rev. 6
AR 01056715	NER NC-10-008 Yellow Buried Cable	Printed 04/04/2024
AR 01056715 Assign #22	NER NC-008-Y Action Item 3 – Identify current inspection and/or dewatering strategy	Printed 04/04/2024
AR 00591281	NRC Generic Letter 2007-01 – Power Cable Failures	Printed 04/04/2024
AR 00591281 Assign #04	Response to GL 2007-01 Input	Printed 04/04/2024
AR 00692997	Submerged Cable Long Term Asset Management Strategy	Printed 04/04/2024
DWG E02-1AP03 Sh. 1	Electrical Loading Diagram Clinton Power Station Unit 1	Rev. AD

Document	Title	Revision / Date
DWG E-CLT6-T02-OSY01-1	Single Line Diagram 345KV Switchyard Clinton Power Station Units 1 & 2	Rev. W
WO 5119345-01	Pump Out and Inspect Safety Related Cable Vaults	04/03/2024
AR 02423635	Cable Vault 0SHA-1C High Water Level Light On	Printed 10/10/2024
AR 02595854	NCV 2015007-01 No IRS for Conditions Adverse to Quality	Printed 10/10/2024
AR 04079295	0SHC-1C High Level Light On With Vault Dry	Printed 10/10/2024
AR 04086090	Cable Vault UAT Will Not Pump	Printed 10/10/2024
AR 04464012	0SHA1B Cable Vault High Level Advisory	Printed 10/10/2024

During the audit, the staff verified the applicant's claim that the "scope of program," "parameters monitored or inspected," "detection of aging effects," "monitoring and trending," "acceptance criteria," and "corrective actions" program elements of the LRA AMP will be consistent with the corresponding elements of the GALL-LR Report AMP.

The staff also verified the applicant's claim that aspects of "preventive actions" program element not associated with the exception identified in the LRA or by the staff during the audit are consistent with the corresponding program element in the GALL-LR Report AMP.

During the audit, the staff made the following observations:

- During its review of the CPS LRA AMP, the staff identified that the applicant's planned inspection frequency of non-safety related manholes and operational testing of dewatering equipment before heavy rain/flooding was not consistent with GALL-LR. The applicant plans to revise LRA AMP B.2.1.39 to ensure consistency with GALL-LR Report AMP XI.E3 in a future supplement.

The staff also audited the description of the LRA Inaccessible Power Cables Not Subject to 10 CFR 50.49 Environmental Qualification Requirements provided in the FSAR supplement. The staff verified this description is consistent with the description provided in the SRP-LR.

LRA AMP B.2.1.40, Metal Enclosed Bus

Summary of Information in the Application

The LRA notes that AMP B.2.1.40, "Metal Enclosed Bus," is an existing program that is consistent with the program elements in GALL-LR Report AMP XI.E4, "Metal Enclosed Bus."

Audit Activities

An on-site audit was performed September 10 to September 12, 2024.

The table below lists documents that were reviewed by the staff and were found relevant to the program. The staff will document its review of this information in the SE.

Document	Title	Revision / Date
CL-PBD-AMP-XI.E4	Metal Enclosed Bus	Rev. 1
ER-AA-300-140	License Renewal Metal Enclosed Program (Constellation Proprietary)	Rev. 4
PM Modification Request (PMMR) IR #: 04548088	LR AMP.XI.E4 MEB Inspections	Not available
WO 01368885	LL – SER 5-09 Check Tightness of Bolts for 4 KV & 6.9 KV Bus	04/19/2011
WO 01471750	Create WO for SER 5-09 Non-Seg Bus Torque/DLRO Checks ERAT	10/26/2015
WO 047770333	Perform EMI Survey on UAT Non Seg Bus (POW1 C1R18)	11/12/2018
AR 01108235	LL-SER 5-09 Check Tightness of Bolts for 4 KV & 6.9 KV Bus OIO	08/31/2010 (event date)
AR 01297528	Crack ID'D on 1AT4B UAT Non-Seg Bus U-Bracket	12/03/2011 (event date)
AR 00989226	SER 5-09 Nonsegregated Bus Failure and Complicated Scram	Print date 05/29/2024
DWG E02-1AP03	Electric Loading Diagram Clinton Power Station Unit 1	Rev. AD

During the audit, the staff verified the applicant's claim that the "scope of program," "preventive actions," "parameters monitored or inspected," "detection of aging effects," "monitoring and trending," "acceptance criteria," and "corrective actions" program elements of the LRA AMP are consistent with the corresponding elements of the GALL-LR Report AMP.

The staff also audited the description of the LRA Metal Enclosed Bus provided in the FSAR supplement. The staff verified this description is consistent with the description provided in the SRP-LR.

The staff made the following observation during walkdowns:

- During the on-site audit, the staff interviewed the applicant's staff and performed a walkdown from the switchyard to the auxiliary, control, diesel generator, and turbine building. The conditions of the metal enclosed bus that were observed by the staff did not show significant signs of age-related degradation.

LRA AMP B.2.1.41, Electrical Cable Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements

Summary of Information in the Application

The LRA notes that AMP B.2.1.41, “Electrical Cable Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements,” is a new program that will be consistent with the program elements in GALL-LR Report AMP XI.E6, “Electrical Cable Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements.” At the time of the audit, the applicant had not yet fully developed the documents necessary to implement this new program, and the staff’s audit addressed only the applicant’s basis document, available procedures, and referenced documents.

Audit Activities

An on-site audit was performed September 10 to September 12, 2024.

The table below lists documents that were reviewed by the staff and were found relevant to the program. The staff will document its review of this information in the SE.

Document	Title	Revision / Date
CL-PBD-AMP-XI.E6	Program Basis Document: Electrical Cable Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements	Rev. 1
CL-AMPBD-E6	Electrical Cable Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Sample Basis Document	Rev. 0
ER-AA-300-120	Electrical Cable Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Program (Markup) (Constellation Proprietary)	Rev. 5
AR 1654494	1RP10J Increasing Thermography Trend on Fuste/Fuse Holder	Printed 05/29/2024
AR 4154359	High Delta T Observed Using Thermography on CT in RAT SVC	Printed 05/29/2024
AR 4252836	High Delta T Observed Using Thermography on 1MP04EA 52-05	Printed 05/29/2024
AR 4154359 Risk Issue CPS-1-2018-0260	RAT SVC CT Elevated Delta T	Printed 04/04/2024
AR 4154359 Risk Issue CPS-1-2018-0318	RAT SVC CT Elevated Delta T	Printed 04/04/2024
MA-AA-716-230	Predictive Maintenance Program (Markup) (Constellation Proprietary)	Rev. 11
MA-AA-716-230-1003	Thermography Program Guide (Constellation Proprietary)	Rev. 7
Engineering Technical Evaluation 20230329	New One-Time Technical Evaluation to Evaluate Thermography and Contact Resistance Testing Results	Printed 04/04/2024

Document	Title	Revision / Date
AR 01608125	Div 3 DC Possible High Resistance Control Circuit Connection	Printed 10/10/2024
AR 03984857	RA OE: Loss of Safety Function Due to Two Inoperable Standby Liquid Control Subsystems	Printed 10/10/2024
AR 04263873	Test Position Failed to Energize/Open Drain Solenoid Valve	Printed 10/10/2024

During the audit, the staff verified the applicant's claim that the "scope of program," "preventive actions," "parameters monitored or inspected," "detection of aging effects," "monitoring and trending," "acceptance criteria," and "corrective actions" program elements of the LRA AMP are consistent with the corresponding elements of the GALL-LR Report AMP.

The staff also audited the description of the LRA Electrical Cable Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements provided in the FSAR supplement. The staff verified this description is consistent with the description provided in the SRP-LR.

LRA AMP B.2.1.42, Internal Coatings/Linings for In-Scope Piping, Piping Components, Heat Exchangers, and Tanks

Summary of Information in the Application

The LRA states that AMP B.2.1.42, "Internal Coatings/Linings for In-Scope Piping, Piping Components, Heat Exchangers, and Tanks," is a new program that will be consistent with the program elements in GALL-LR Report AMP XI.M42, "Internal Coatings/Linings for In-Scope Piping, Piping Components, Heat Exchanger, and Tanks," as described in LR-ISG-2013-01, "Aging Management of Loss of Coating or Lining Integrity for Internal Coatings/Linings on In-Scope Piping, Piping Components, Heat Exchangers, and Tanks." At the time of the audit, the applicant had not yet fully developed the documents necessary to implement this new program, and the staff's audit addressed only the program elements described in the applicant's basis document.

Audit Activities

The table below lists documents that were reviewed by the staff and were found relevant to the program. The staff will document its review of this information in the SE.

Document	Title	Revision / Date
CL-PBD-AMP-XI.M42	Program Basis Document: Internal Coatings/Linings for In-Scope Piping, Piping Components, Heat Exchangers, and Tanks	Rev.1
AR 00539602	Action Request: 1DO01TA Has Small Area of Coating Peeled Off	10/03/2006
AR 01626078	Action Request: Missing Coating on 0WO02CD Condenser Water Box	02/25/2014
AR 01656705	Action Request: 1SX20AB As-Found Inspection of Coating	05/06/2014
AR 02566881	Action Request: Indications Found During Fuel Tank Inspection	10/07/2015

Document	Title	Revision / Date
EC403488	Document Acceptability of the Existing Coating Deficiency Identified Per A/R 02566881 for 1DO01TB	Rev. 0
WO 1468632	Work Order: 0WO02CD Clean Heat Exchanger, Hydrolance Tubes, Eddy	01/17/2014
ER-AA-330-014	Exelon Safety-Related (Service Level III) Coatings (Constellation Proprietary)	Rev. 5

During the audit, the staff verified the applicant's claim that the "scope of program," "preventive actions," "detection of aging effects," and "monitoring and trending" program elements of the LRA AMP are consistent with the corresponding elements of the GALL-LR Report AMP.

In addition, the staff found that for the "parameters monitored or inspected," "acceptance criteria," and "corrective actions" program elements, sufficient information was not available to verify whether they were consistent with the corresponding program elements of the GALL-LR Report AMP. The staff will consider issuing an RAI in order to obtain the information necessary to verify whether these program elements are consistent with the corresponding program elements of the GALL-LR Report AMP.

The staff also audited the description of the LRA Internal Coatings/Linings for In-Scope Piping, Piping Components, Heat Exchangers, and Tanks program provided in the FSAR supplement. The staff verified this description is consistent with the description provided in the SRP-LR.

LRA AMP B.3.1.1, Fatigue Monitoring

Summary of Information in the Application

The LRA states that aging management program (AMP) B.3.1.1, "Fatigue Monitoring," is an existing program with enhancements that is consistent with the program elements in GALL Report (Revision 2) AMP X.M1, "Fatigue Monitoring." To verify this claim of consistency, the staff audited the LRA AMP. During the audit, the staff also reviewed the enhancements associated with this AMP. The staff will document its review of the enhancements in the SE.

At the time of the audit, the applicant had not yet fully developed the documents necessary to implement this enhanced program, and the staff's audit addressed only the program elements described in the applicant's basis document. The staff will address issues identified but not resolved in this audit report in the SE.

Audit Activities

During its audit, the staff interviewed the applicant's staff and reviewed documentation contained in the LRA and provided by the applicant via the ePortal. For the operating experience (OE) review, the applicant made a presentation on the process used to identify and evaluate the pertinent OE. Afterwards, the staff conducted its review of the applicant's methodology and OE by reviewing documentation contained in the LRA and ePortal.

The table below lists documents that were reviewed by the staff and were found relevant to the program. The staff will document its review of this information in the SE.

Document	Title	Revision / Date
ER-AA-700-1003	Use of Operating Experience for License Renewal Implementation/Aging Management (Constellation Proprietary)	Rev.6
PI-AA-115	Operating Experience Program (Constellation Proprietary)	Rev. 7
CPS-PBD-AMP-X.M1	Program Basis Document Fatigue Monitoring	Rev. 3 07/23/2024
ER-AA-47	Fatigue Management Program Description (Constellation Proprietary)	Rev. 3
ER-AA-470	Fatigue and Transient Monitoring Program (Constellation Proprietary)	Rev. 10
CPS 1437.01	NSSS Transient Monitoring (Constellation Proprietary)	Rev. 2a 10/15/2014
EC 627713	CPS Fatigue Monitoring Report 2018	09/24/2019
AR 00815315	CPS Exceeded 80% of Allowable Turbine Roll Transients	09/08/2008
AR 01105330	Fatigue Monitoring Related to Turbine Roll Transients	08/24/2010
AR 00905434	Potential Issue with FatiguePro Monitoring of FW Nozzle	04/09/2009
AR 02535716	Location MS-460 Reaches 80% Cumulative Usage Factor (CUF)	07/31/2015
AR 02724948	FatiguePro Program Data Shows No Change in FW Nozzle Fatigue	10/06/2016
AR 04521325	LR – MSIV Lines EC 360654	09/08/2022
AR 04554704	2001 EPU Report Results Not Incorporated in Fatigue Program	02/15/2023

During the audit, the staff verified the applicant's claim that the "scope of program," "preventive actions," "parameters monitored or inspected," "detection of aging effects," "monitoring and trending," "acceptance criteria," and "corrective actions" program elements of the LRA AMP are consistent with the corresponding elements of the GALL Report AMP, or will be consistent after implementation of the identified enhancements.

The staff also audited the description of the LRA Fatigue Monitoring AMP provided in the FSAR supplement. The staff verified this description is consistent with the acceptance criteria provided in SRP-LR (Revision 2) Section 3.1.2.5.

LRA AMP B.3.1.2, Environmental Qualification (EQ) of Electric Components

Summary of Information in the Application

The LRA notes that AMP B.3.1.2, “Environmental Qualification (EQ) of Electric Components,” is an existing program that is consistent with the program elements in GALL-LR Report AMP X.E1, “Environmental Qualification (EQ) of Electric Components.”

Audit Activities

An on-site audit was performed September 10 to September 12, 2024.

The table below lists documents that were reviewed by the staff and were found relevant to the program. The staff will document its review of this information in the SE.

Document	Title	Revision / Date
CL-PDB-AMP-X.E1	Environmental Qualification (EQ) of Electric Components GALL PROGRAM X.E1 - Environmental Qualification (EQ) of Electric Components	Rev. 1
AR 02537305	10 CFR Part 21 NAMCO EA180 and EA170 Limit Switches	Print date 05/30/2024
AR 02541236	Part 21: NAMCO Limit Switch (EA170/EA180)	Print date 05/30/2024
AR 04431409	NOS ID: Develop work down curve for EQ Binder revisions	Print date 05/30/2024
AR 04675921	EQ Program Document Issues	Print date 05/30/2024
AR 04775740	LR: Enhance CPS EQ Program to Support 60 Year Ops	Print date 09/12/2024
AR 04776265	LR: EQ Process Radiation Monitors	Print date 09/12/2024
CC-AA-203 (Markup)	Environmental Qualification Program (Constellation Proprietary)	Rev. 17
NSED Procedure E.6	Environmental Qualification Packages (Constellation Proprietary)	Rev. 13
NSED-MEQPM-MS-02.00	Maintenance of Equipment Qualification Program Manual (Constellation Proprietary)	10/19/2018
EC 0000636711	RWCU Differential Flow modification	03/13/2024
CPS EQ Challenges (IR #: 4776265)	EQ-CL016 - Eberline SR Process Radiation Monitoring System	08/19/2024
EQ-CL003 Tab C	Analysis, Calculation, or Justification to Support Qualification	Rev. 14
EQ-CL011 Tab C	Analysis, Calculation, or Justification to Support Qualification	Rev. 22

Document	Title	Revision / Date
EQ-CL037 Tab C	Analysis, Calculation, or Justification to Support Qualification	Rev. 08
EQ-CL068 Tab C	Analysis, Calculation, or Justification to Support Qualification	Rev. 11
EQ-CL093 Tab C	Analysis, Calculation, or Justification to Support Qualification	Rev. 16
EQ-CL015 Tab C	Analysis, Calculation, or Justification to Support Qualification	Rev. 03

During the audit, the staff verified the applicant's claim that the "scope of program," "preventive actions," "parameters monitored or inspected," "detection of aging effects," "monitoring and trending," "acceptance criteria," and "corrective actions" program elements of the LRA AMP are consistent with the corresponding elements of the GALL-LR Report AMP.

The staff also audited the description of the LRA Environmental Qualification (EQ) of Electric Components provided in the FSAR supplement. The staff verified this description is consistent with the description provided in the SRP-LR Report.

The staff made the following observation during walkdowns:

- During the on-site audit, the staff interviewed the applicant's staff and performed a walkdown. During the staff interviews, the staff asked the applicant if they were aware of the latest version of the EPRI Report NP-1558, "A Review of Aging Theory and Technology," and whether they assessed its potential impact on the qualification of electrical components in the CPS EQ program. The applicant responded that they reviewed their EQ files and determined that there was only one EQ binder that used an activation energy value from EPRI Report NP-1558 and the selected activation energy remains valid in the current version of the report.

LRA TLAA Section 4.1, Identification and Evaluation of Time-Limited Aging Analyses (TLAAS)

Summary of Information in the Application

LRA Section 4.1, "Identification and Evaluation of Time-Limited Aging Analyses (TLAAS)," discusses the methodology for the identifying of TLAAs in the LRA. The staff performed an audit to verify the implementation of the applicant's methodology to identify TLAAs in accordance with 10 CFR Part 54. Issues identified but not resolved in this report will be addressed in the SE.

Audit Activities

During the audit, the staff reviewed documentation contained in the LRA and provided by the applicant via the ePortal. The table below lists documents that were reviewed by the staff and were found relevant to its review for TLAA identification. The staff will document its review of this information in the SE.

Document	Title	Revision / Date
CL-TLAABD	Time-Limited Aging Analysis (TLAA) Basis Document – Part 1 – TLAA Identification – Clinton LR Includes Attachments 1 through 13	Rev. 0
	Updated Safety Analysis Report	Rev. 23

During the audit, the staff verified that the applicant has provided its basis and methodology for identifying TLAAs, as defined in 10 CFR 54.3(a), in accordance with 10 CFR 54.21(c)(1).

During the audit, the staff made the following observations:

- The staff reviewed the CL-TLAABD, Part 1, and confirmed that current licensing basis and design basis documentation were searched to identify potential TLAAs.
    - The staff noted that specific key words were used during this search that would identify potential TLAAs. The staff noted that a comprehensive list of key words was used for this search.
    - The staff noted that keywords used were reasonable for identifying analyses associated with time-dependency and aging-related degradation.
        - Keywords included, but not limited to the following: “fluence,” “life,” “cycles,” “40-year,” “50.12,” “exemption,” “corrosion allowance”
        - Attachment 8 of CL-TLAABD, Part 1 – contained the applicant’s complete list of keywords
- The staff reviewed the CL-TLAABD, Part 1, and confirmed that each potential TLAA was reviewed against the six criteria of 10 CFR 54.3(a) and that those that met all six criteria were identified as TLAAs, which require evaluation for the period of extended operation.
    - Attachment 6 of CL-TLAABD, Part 1 – contained the applicant’s complete documentation of dispositioning any potential analyses against the six criteria of a TLAA in 10 CFR 54.3
- The staff reviewed the CL-TLAABD, Part 1, and confirmed that a search of docketed licensing correspondence, the operating license, and the FSAR identified whether there were any active exemptions currently in effect pursuant to 10 CFR 50.12.

- The staff reviewed the CL-TLAABD, Part 1, and confirmed that these exemptions were then reviewed to determine whether the exemption was based on a TLAA.

    - The staff confirmed that there are no identified 10 CFR 50.12 exemptions identified that is currently in effect that is based upon a TLAA.

LRA TLAA Section 4.2.1, Reactor Pressure Vessel and Internals Neutron Fluence Analyses

Summary of Information in the Application

LRA Section 4.2.1, "Reactor Pressure Vessel and Internals Neutron Fluence Analyses," discusses the analysis for the neutron fluence in the reactor pressure vessel (RPV) as an input to other reactor pressure vessel neutron embrittlement analyses. The applicant dispositioned the TLAA (time-limited aging analysis) in accordance with 10 CFR 54.21(c)(1)(ii). To verify that the applicant provided an acceptable basis to support its disposition of the TLAA, the staff audited the TLAA.

Audit Activities

During its audit, the staff reviewed documentation contained in the LRA and provided by the applicant via the ePortal.

The table below lists documents that were reviewed by the staff and were found relevant to the TLAA. The staff will document its review of this information in the SE.

Document	Title	Revision / Date
CL-TLAABD	TLAA Basis Document – Part 2 – TLAA Evaluation	Rev. 0
NEDC-32983P-A	Licensing Topical Report – General Electric Methodology for Reactor Pressure Vessel Fast Neutron Flux Evaluations	Rev. 2

During the audit of the TLAA, the staff verified that the applicant provided basis that supports the disposition of 10 CFR 54.21(c)(1)(ii). In addition, the staff determined that no RAI was necessary. The staff will discuss the findings of the audit in the SE.

LRA TLAA Sections 4.2.2 and 4.2.3 (Upper-Shelf Energy and Adjusted Reference Temperature)

Summary of Information in the Application

The staff's audit addresses the following TLAAs collectively due to their relationship in analyzing the reactor vessel neutron embrittlement:

- LRA Section 4.2.2, "Reactor Pressure Vessel Upper-Shelf Energy (USE) Analyses" discusses the analysis for assessing the projected reduction in the upper-shelf energy (USE) properties of RPV base metal and weld components. The applicant dispositioned the TLAA in accordance with 10 CFR 54.21(c)(1)(ii).

- LRA Section 4.2.3, “Reactor Pressure Vessel Adjusted Reference Temperature (ART) Analyses” discusses the analyses for assessing the use of adjusted reference temperature (ART) to adjust the pressure-temperature limit curves to account for irradiation effects. The applicant dispositioned the TLAA in accordance with 10 CFR 54.21(c)(1)(ii).

To verify that the applicant provided a basis to support its disposition of the TLAA, the staff audited the TLAA. The staff will address issues identified but not resolved in this audit in the SE.

Audit Activities

During its audit, the staff interviewed the applicant’s staff and reviewed documentation contained in the LRA and provided by the applicant via the ePortal. The staff conducted its review of the applicant’s methodology and OE by reviewing documentation contained in the LRA and ePortal.

The table below lists documents that were reviewed by the staff and were found relevant to the program. The staff will document its review of this information in the SE.

Document	Title	Revision / Date
CL-TLAABD	TLAA Basis Document – Part 2 – TLAA Evaluation	Rev. 0
BWRVIP-135	BWR Vessel and Internals Project: Integrated Surveillance Program (ISP) Data Source Book and Plant Evaluations	Rev. 4
BWRVIP-74-A	BWR Vessel and Internals Project: BWR Reactor Pressure Vessel Inspection and Flaw Evaluation Guidelines for License Renewal	06/2003
GEH Report 007N4076R0	License Renewal Fluence & RPV Internal Analysis	Rev. 0
GEH Report DBR-00686669	GEH Internal Design Basis Record – Design Notes	Rev. 0
GE-NE-B13-02084-00-01	Pressure-Temperature Curves For AmerGen, Clinton Power Station Using the KIC Methodology	Rev. 0
GEH Report 0000-0132-5419	GEH internal Design Basis Record – Design Notes	Rev. 1
GE, DRF No. A00-01796	GEH internal Design Basis Record – Design Notes	01/1985
	Certified Material Test Report for Heat C4209-1	
	Certified Material Test Report for Heat C4212-1	
	Certified Material Test Report for Heat C4245-1	
	Certified Material Test Report for Heat Q2QL13W	
	Certified Material Test Report for Heat Q2QL4W	
	Certified Material Test Report for Heat Q2QL8QT (N2)	
	Certified Material Test Report for Heat Q2QL8W	
	Certified Material Test Report for Heat Q2QL8QT (N6)	
	Certified Material Test Report for Heat Q2QL19QT	
	Certified Material Test Report for Heat 3P4955/3478 (Single)	

Document	Title	Revision / Date
	Certified Material Test Report for Heat 3P4955/3478 (Tandem)	
	Certified Material Test Report for Heat 3P4955/3478 (Tandem)	
	Certified Material Test Report for Heat 422P5621/L414B27AD	
	Certified Material Test Report for Heat C4320-2	

During the audit of the TLAA, the staff verified that the applicant has provided its basis that supports its disposition of 10 CFR 54.21(c)(1)(ii) for LRA Sections 4.2.2 and 4.2.3.

During the audit, the staff made the following observations:

- The staff verified that the material information (e.g., initial RTNDT, %Cu, %Ni, initial USE, margin values) for the RPV materials contained in LRA Tables 4.2.2-1, 4.2.2-2, 4.2.2-3, 4.2.2-4, 4.2.2-5, 4.2.2-6, 4.2.2-7, 4.2.3-1, 4.2.3-2, 4.2.3-3, and 4.2.3-4, except as noted below, are:
    - Consistent with the applicant's current licensing basis (e.g., FSAR, license amendments associated with power uprates or pressure-temperature limits) or NRC approved topical reports (i.e., BWRVIP-86, Rev 1-A)
    - Or based on information from certified material test reports (CMTRs) or fabrication records for the specific material or weld type

- The staff noted that the %Cu of the following RPV materials were calculated in a manner more conservative than the methodology in RG 1.99, Revision 2 (GE, DBR-0068669, Rev 0):
    - CPS Shell #3 plates contained in LRA Table 4.2.3-1 (i.e., Heat Nos. C4209-1, C4212-1 and C4245-1)
    - CPS N1 nozzle contained in LRA Tables 4.2.2-3 and 4.2.3-3 (i.e., Heat No. Q2QL13W)
    - CPS N6 nozzle, contained in LRA Tables 4.2.2-3 and 4.2.3-3 (i.e., Heat No. Q2QL8QT).

- The staff noted that for the following RPV materials, plant-specific measured values from CMTRs or fabrications records were used in lieu of best estimate data:
    - %Ni of CPS Heat No. 5P6756 contained in LRA Tables 4.2.3-1 through 4.2.3- 4 (GE, DRF No. A00-01796).
    - Initial USE for CPS Heat No. C4320-2 contained in LRA Table 4.2.2-1 (CMTR for Heat No. C4320-2).
    - Initial USE for CPS Heat No. 422P5621/L414B27AD contained in LRA Table 4.2.2-2 (CMTR for Heat No. 422P5621/L414B27AD).

- The staff noted that USE data of CPS N2 nozzles contained in LRA Tables 4.2.2-3 and 4.2.3-3 (i.e., Heat Nos. Q2QL4W, Q2QL8QT, Q2QL8W) were not available in CMTRs and were conservatively determined (i.e., lowest of all measured values for same class of material) (GEH, 0000-0132-5419, Revision 1).

- The staff confirmed that the initial RTNDT for the CPS Shell #3 plates contained in LRA Table 4.2.3-1 (i.e., Heat Nos. C4209-1, C4212-1 and C4245-1) were determined based on available information in CMTRs based on a methodology previously approved by the NRC (GE-NE-B13-02084-00-01).

- The staff noted LRA Table 4.2.3-4 discusses the applicant's adjustment for ART when considering surveillance data. The staff verified the applicant's assessment of surveillance data contained in BWRVIP-135, Revision 4 was performed in accordance with RG 1.99, Revision 2, for the following RPV material:

    - Heat No. 5P6756

The staff also audited the description of the USE and ART TLAAs in LRA Section A.4.2.2 and A.4.2.3, respectively, provided in the FSAR supplement. The staff verified this description is consistent with the description provided in the SRP-LR.

LRA TLAA Section 4.2.4, "Reactor Pressure Vessel Pressure-Temperature (P-T) Limits"

Summary of Information in the Application

LRA Section 4.2.4, Reactor Pressure Vessel Pressure-Temperature (P-T) Limits," discusses the analysis for the P-T limit curves, which specify the minimum acceptable reactor coolant temperature as a function of reactor pressure, associated with the RPV. The applicant dispositioned the TLAA in accordance with 10 CFR 54.21(c)(1)(iii).

Audit Activities

The table below lists documents that were reviewed by the staff and were found relevant to the TLAA. The staff will document its review of this information in the SE.

Document	Title	Revision / Date
	Constellation Energy Generation, LLC - Docket No. 50-461 Clinton Power Station, Unit No. 1 Facility Operating License - Technical Specifications – Section 3.4.11	Amendment No. 134
CL-TLAABD	Time-Limited Aging Analysis (TLAA) Basis Document – Part 2 – TLAA Evaluation – (Clinton LR) – Section 4.2.4	Rev. 0

During the audit of the TLAA, the staff verified that the applicant has provided its basis that supports its disposition of 10 CFR 54.21(c)(1)(iii).

During the audit, the staff made the following observations:

- Current P-T limits are contained in Technical Specification Section 3.4, "REACTOR COOLANT SYSTEM (RCS)" – Section 3.4.11 RCS Pressure and Temperature (P/T) Limits

- Current P-T limits are applicable though 32 Effective Full Power Years (EFPY)

The staff also audited the description of the LRA TLAA provided in the FSAR supplement. The staff verified this description is consistent with the description provided in the SRP-LR.

LRA TLAA Section 4.2.5, "Reactor Pressure Vessel Circumferential Weld Failure Probability Analyses"

Summary of Information in the Application

LRA Section 4.2.5, "Reactor Pressure Vessel Circumferential Weld Failure Probability Analyses" discusses the analysis for the RPV circumferential weld failure probability. The applicant dispositioned the TLAAs in accordance with 10 CFR 54.21(c)(1)(iii).

Audit Activities

In addition to the OE documentation contained in the LRA and ePortal, the staff observed the applicant's search of its operating experience database used the following relevant keywords: ("cracking", "embrittlement")

The table below lists documents that were reviewed by the staff and were found relevant to the TLAA. The staff will document its review of this information in the SE.

Document	Title	Revision / Date
CL-TLAABD	Time-Limited Aging Analysis (TLAA) Basis Document – Part 2 – TLAA Evaluation – (Clinton LR) – Section 4.2.5	Rev. 0
BWRVIP-05	BWR Vessel and Internals Project, BWR Reactor Pressure Vessel Shell Weld Inspection Recommendations (BWRVIP-05) (Proprietary)	09/1995
BWRVIP-05 SER (Final)	USNRC letter from Gus C. Lainas to Carl Terry, Niagara Mohawk Power Company, BWRVIP Chairman, Final Safety Evaluation of the BWR Vessel and Internals Project BWRVIP-05 Report, (TAC No. M93925) (Proprietary)	07/28/1998
USNRC Generic Letter 98-05,	Boiling Water Reactor Licensees Use of the BWRVIP-05 Report to Request Relief From Augmented Examination Requirements on Reactor Pressure Vessel Circumferential Shell Welds	11/10/1998
	Supplement To Final Safety Evaluation of the BWR Vessel and Internals Project BWRVIP-05 Report (TAC NO. MA3395)	03/07/2000

During the audit of the TLAA, the staff verified that the applicant has provided its basis that supports its disposition of 10 CFR 54.21(c)(1)(iii).

During the audit, the staff made the following observations:

- The staff confirmed that the RPV material identified in LRA Table 4.2.5-1 (i.e., Heat No. 76492) is the limiting RPV circumferential weld
- The staff confirmed the material property information for Heat No. 76492 is consistent with the information in FSAR Section 5.3.

The staff also audited the description of the LRA TLAA provided in the FSAR supplement. The staff verified this description is consistent with the description provided in the SRP-LR.

LRA TLAA Section 4.2.6, "Reactor Pressure Vessel Axial Weld Failure Probability Analyses"

Summary of Information in the Application

LRA Section 4.2.6, "Reactor Pressure Vessel Axial Weld Failure Probability Analyses" discusses the analysis for the reactor pressure vessel axial weld failure probability. The applicant dispositioned the TLAAs in accordance with 10 CFR 54.21(c)(1)(ii).

Audit Activities

In addition to the OE documentation contained in the LRA and ePortal, the staff observed the applicant's search of its operating experience database used the following relevant keywords: ("cracking", "embrittlement").

The table below lists documents that were reviewed by the staff and were found relevant to the TLAA. The staff will document its review of this information in the SE.

Document	Title	Revision / Date
CL-TLAABD	Time-Limited Aging Analysis (TLAA) Basis Document – Part 2 – TLAA Evaluation – (Clinton LR) – Section 4.2.6	Rev. 0
ML093640023	NRC Letter - Clinton Power Station Unit No.1 – Request For Alternative 4215 For Class 1 Reactor Vessel Circumferential Shell Welds (TAC No. ME0407)	12/30/2009
BWRVIP-74-A	BWR Vessel and Internals Project – BWR Reactor Pressure Vessel Inspection and Flaw Evaluation Guidelines for License Renewal, (Proprietary)	06/2003
	Supplement To Final Safety Evaluation of the BWR Vessel and Internals Project BWRVIP-05 Report (TAC NO. MA3395)	03/07/2000
BWRVIP-135	Integrated Surveillance Program (ISP) Data Source Book and Plant Evaluations (Proprietary)	Rev.4

During the audit of the TLAA, the staff verified that the applicant has provided its basis that supports its disposition of 10 CFR 54.21(c)(1)(ii).

During the audit, the staff made the following observations:

- The staff confirmed that the RPV material identified in LRA Table 4.2.6-1 (i.e., Heat No. 3P4955/0342) is the limiting RPV axial weld

- The staff confirmed the material property information for Heat No. 3P4955/0342 is consistent with the information in FSAR Section 5.3. The staff noted that Cu% and Ni% for this material is the BWRVIP Integrated Surveillance Program best estimate chemistry and is also contained in BWRVIP-135, Revision 4. The staff will evaluate this in its SE.

The staff also audited the description of the LRA TLAA provided in the FSAR supplement. The staff verified this description is consistent with the description provided in the SRP-LR.

LRA TLAA Section 4.2.8, Jet Pump Beam Bolts and Core Plate Bolts Preload Relaxation Analyses

Summary of Information in the Application

LRA Section 4.2.8 “Jet Pump Beam Bolts and Core Plate Bolts Preload Relaxation Analyses,” discusses the analyses for stress relaxation in important bolts that must carry a load to maintain functionality of the jet pump and the core plate. The applicant dispositioned the TLAA in accordance with 10 CFR 54.21(c)(1)(ii).

Audit Activities

The staff reviewed the OE listed in the LRA and the document portal. The table below lists documents that were reviewed by the staff and were found relevant to the TLAA. The staff will document its review of this information in the SE.

Document	Title	Revision / Date
007N3874	RPV Internals Analysis of Preloaded Joints & Core Shroud Thermal Shock Analysis (Proprietary)	Rev. 0 12/2022

During the audit of the TLAA, the staff verified that the applicant has provided its basis that supports its disposition of 10 CFR 54.21(c)(1)(ii).

During the audit, the staff made the following observations:

- General Electric Hitachi (GEH) proprietary report 007N3874 describes clamping loads relied on by the applicant, but it does not explain how those loads were determined.

- The applicant explained that GEH calculated required clamping loads based on operating conditions. Then, GEH used proprietary stress relaxation data to ensure that the end-of-life clamping loads are greater than the required loads.

The staff also audited the description of the Jet Pump Beam Bolts and Core Plate Bolts Preload Relaxation Analyses provided in the FSAR supplement. The staff verified this description is consistent with the description provided in the SRP-LR.

LRA TLAA Section 4.2.9, Core Shroud Repair Stabilizer Assembly Bracket Preload Relaxation Analysis

Summary of Information in the Application

LRA Section 4.2.9 “Core Shroud Repair Stabilizer Assembly Bracket Preload Relaxation Analyses,” discusses the analyses for stress relaxation in repair hardware for the core shroud. The applicant dispositioned the TLAA in accordance with 10 CFR 54.21(c)(1)(ii).

Audit Activities

The staff reviewed the OE listed in the LRA and the document portal. The table below lists documents that were reviewed by the staff and were found relevant to the TLAA. The staff will document its review of this information in the SE.

Document	Title	Revision / Date
007N3874	RPV Internals Analysis of Preloaded Joints & Core Shroud Thermal Shock Analysis (Proprietary)	Rev.0 12/2022

During the audit of the TLAA, the staff questioned the applicant’s basis that supports its disposition of 10 CFR 54.21(c)(1)(ii).

During the audit, the staff made the following observations:

- General Electric Hitachi (GEH) proprietary report 007N3874 describes clamping loads relied on by the applicant, but it does not explain how those loads were determined.

- The applicant explained that GEH calculated required clamping loads based on operating conditions. Then, GEH used proprietary stress relaxation data to ensure that the end of life clamping loads are greater than the required loads.

- The applicant explained that the TLAA may be more appropriately dispositioned as 10 CFR 54.21(c)(1)(i), since the clamping load analysis was not updated.

- The applicant stated that they may submit a supplement changing the proposed disposition of the TLAA.

The staff also audited the description of the Core Shroud Repair Stabilizer Assembly Bracket Preload Relaxation Analyses provided in the FSAR supplement. The staff verified this description is consistent with the description provided in the SRP-LR.

LRA TLAA Section 4.2.10, Reactor Pressure Vessel Core Support Structure Strain Evaluation

Summary of Information in the Application

LRA Section TLAA 4.2.10, “Reactor Pressure Vessel Core Support Structure Strain Evaluation,” discusses the evaluation of core support structure components: the shroud, shroud support, top guide, core plate, core plate wedges, orificed fuel support, peripheral fuel support, control rod guide tubes, and control rod housing. The applicant dispositioned the TLAA in accordance with 10 CFR 54.21(c)(1)(ii). To verify that the applicant provided an acceptable technical basis to support its disposition of the TLAA, the staff audited the TLAA.

Audit Activities

A search of the applicant’s operating experience database was conducted using keywords: “flaw evaluation,” “core support,” “stresses,” “design cycle,” “neutron fluence,” “RPV internals,” “stress analysis,” and “cracking.” No significant plantspecific operating experience associated with the LRA TLAA Section 4.2.10, was noted by the staff during its review.

During its audit, the staff interviewed the applicant’s staff and reviewed documentation provided by the applicant. The staff reviewed the following relevant documents.

Document	Title	Revision / Date
GE Hitachi, ePortal Reference 4.9.11	Clinton RPV Internals Fluence Impact Assessment	Revision 0 November 2022
GE, ePortal Reference 4.9.12	Stress Analysis report for BWR/6-218 Core Plate and Lower Shroud	Revision 0 1979
GE, ePortal Reference 4.9.93	Core Support Structure	Revision 8 8/29/1991
LRA Section 4.2.10	Reactor Pressure Vessel Core Support Structure Strain Evaluation	Revision 0 2/14/2024
LRA Section 4.2.1.2	Reactor Pressure Vessel Internals Neutron Fluence Analysis	Revision 0 2/14/2024

During the audit of the TLAA, the staff verified that the applicant has provided its technical basis that supports its disposition of 10 CFR 54.21(c)(1)(ii).

During the audit, in addition to reviewing relevant Clinton LRA sections, the staff reviewed the following three reports in the ePortal, “Clinton RPV Internals Fluence Impact Assessment,” “Stress Analysis report for BWR/6-218 Core Plate and Lower Shroud,” and “Core Support Structure.”

Based on those reports, the staff made the following observations:

- The staff noted that Clinton design specifications required calculated strain assessments of reactor core support structure components fabricated from 304, 304L, 308, and 308L austenitic stainless steels if the specified fluence thresholds in the design specifications were exceeded as discussed in ePortal reference 4.9.11, "Clinton RPV Internals Fluence Impact Assessment."

- The staff confirmed that evaluations demonstrating that the specified design criteria were met for the 40-year life of the station, were documented in the original component design stress reports as discussed in the report, "Stress Analysis report for BWR/6-218 Core Plate and Lower Shroud."

- The staff confirmed that Clinton evaluated core support structure components fabricated from austenitic stainless steels using 60-year fluence projections (52 EFPY) as discussed in the report, "Clinton RPV Internals Fluence Impact Assessment report."
    - The staff confirmed that the applicant's methodology in this updated strain assessment for 60 years is consistent with the methodology used in the original design analysis (i.e., "Stress Analysis report for BWR/6-218 Core Plate and Lower Shroud.")
    - The staff confirmed that the acceptance criteria in the applicant's updated strain assessment is consistent with those established in the original design analysis (i.e., "Stress Analysis report for BWR/6-218 Core Plate and Lower Shroud.")
    - The staff confirmed that the applicant's updated strain assessment took into consideration the neutron fluence exposure of the RPV core support structure through 60 years of operation as discussed in LRA Section 4.2.1.2, "Reactor Pressure Vessel Internals Neutron Fluence Analyses," and ePortal Reference 4.9.11, "Clinton RPV Internals Fluence Impact Assessment."
    - The staff noted that LRA Section 4.2.1.2 states that the applicant has used the NRC approved GEH DORT methodology in developing 60-year fluence projections that account for an Extended Power Uprate (EPU). These 60-year fluence projections are based on the methodology in Licensing Topical Report (LTR) NEDC-32983P-A (LRA Reference 4.8.9 or ML072480121).

The staff found that sufficient information was available to complete its review of TLAA Section 4.2.10.

During the audit of the operating experience associated with the TLAA, the staff independently searched the plant-specific database to identify any previously unknown or recurring aging effects. The staff did not identify any additional aging effects that would have an impact on the evaluation of the TLAA.

The staff also audited the summary description of the TLAA for the reactor pressure vessel core support structure strain evaluation provided in Section A.4.2.10 of the UFSAR supplement. The staff verified this summary description is consistent with the generic description provided in the SRPLR.

LRA TLAA Section 4.3.1, Transient Cycle And Cumulative Usage Projections For 60 Years

Summary of Information in the Application

LRA Section 4.3.1, "Transient Cycle And Cumulative Usage Projections For 60 Years," discusses the 60-year projections of design transient cycles and the associated cumulative usage factor (CUF) and environmentally adjusted CUF (CUF_{en}) values. The applicant did not identify these projections as a TLAA because (1) the 60-year projections are used as the input to the fatigue TLAAs in LRA Sections 4.3.2 through 4.3.7 and (2) the specific dispositions of the TLAAs are separately addressed in LRA Sections 4.3.2 through 4.3.7. To verify the adequacy of the cycle and cumulative usage projections, the staff audited the applicant's approach in LRA Section 4.3.1. The staff will address issues identified but not resolved in this audit report in the SE.

Audit Activities

During its audit, the staff interviewed the applicant's staff and reviewed documentation contained in the LRA and provided by the applicant via the ePortal. For the operating experience (OE) review, the applicant made a presentation on the process used to identify and evaluate the pertinent OE. Afterwards, the staff conducted its review of the applicant's methodology and OE by reviewing documentation contained in the LRA and ePortal.

The table below lists documents that were reviewed by the staff and were found relevant to the 60-year projections of transient cycles and the associated CUF and CUF_{en} values. The staff will document its review of this information in the SE.

Document	Title	Revision / Date
CL-TLAABD	Time-Limited Aging Analysis (TLAA) Basis Document – Part 2 – TLAA Evaluation – Clinton LR	Rev. 0 02/6/2024
Structural Integrity Associates (SIA) FP-CPS-314	Cycle, Fatigue, and Environmentally Assisted Fatigue (EAF) Projections for 60 Years	Rev. 1 12/22/2023
SIA 1701003.301	SI:FatiguePro4 Cycle and Fatigue 60-Year Projections	Rev. 0 05/04/2022

During the audit of the cycle and cumulative usage projections, the staff verified that the applicant provided its basis for the projections. However, the staff found that sufficient information was not available to complete its review of the adequacy of the 60-year projections. In order to obtain the necessary information, the staff will consider issuing RAIs. During the audit, the staff made the following observations.

LRA Table 4.3.1-1 indicates that the number of the 60-year projected occurrences (cycles) of the "design hydrostatic test" transient is 44, which is greater than the design transient cycles of 40. Similarly, LRA Table 4.3.1-1 indicates that, for the "turbine roll" transient and "hot zero power scram" transient, the number of 60-year projected cycles exceeds the number of design transient cycles.

In comparison, the applicant dispositioned the fatigue TLAAs for the following components in accordance with 10 CFR 54.21(c)(1)(i): (1) main steam isolation valves; (2) safety/relief valves; (3) recirculation system flow control valves; (4) recirculation system gate valves; (5) recirculation system pumps; (6) control rod drives; and (7) core plate stiffener to skirt weld and top guide/grid reactor vessel internal components.

Given the TLAA disposition for the components discussed above in accordance with 10 CFR 54.21(c)(1)(i) (i.e., not using cycle projections or Fatigue Monitoring AMP), the staff needs clarification on whether the 60-year projected cycles of the "design hydrostatic test," "turbine roll," and "hot zero power scram" transients, which are greater than the design cycles, may affect the validity of the TLAA disposition (e.g., resulting in the 60-year CUF values of these components exceeding the design limit).

The staff also audited the description of the 60-year cycle and cumulative usage projections. The staff verified that this description is consistent with the acceptance criteria provided in SRP-LR (Revision 2) Section 4.3.2.2.

LRA TLAA Section 4.3.2, ASME Section III, Class 1 and Environmentally Assisted Fatigue Analyses

Summary of Information in the Application

LRA Section 4.3.2, "ASME Section III, Class 1 and Environmentally Assisted Fatigue Analyses," discusses the Class 1 fatigue and environmentally assisted fatigue (EAF) TLAAs. The applicant dispositioned the TLAAs in accordance with 10 CFR 54.21(c)(1)(iii). To verify that the applicant provided a basis to support its disposition of the TLAAs, the staff audited the TLAAs. The staff will address issues identified but not resolved in this audit report in the SE.

Audit Activities

During its audit, the staff interviewed the applicant's staff and reviewed documentation contained in the LRA and provided by the applicant via the ePortal. For the operating experience (OE) review, the applicant made a presentation on the process used to identify and evaluate the pertinent OE. Afterwards, the staff conducted its review of the applicant's methodology and OE by reviewing documentation contained in the LRA and ePortal.

The table below lists documents that were reviewed by the staff and were found relevant to the Class 1 fatigue and EAF TLAAs. The staff will document its review of this information in the SE.

Document	Title	Revision / Date
CL-TLAABD	Time-Limited Aging Analysis (TLAA) Basis Document – Part 2 – TLAA Evaluation – Clinton LR	Rev. 0 02/06/2024
SIA FP-CPS-314	Cycle, Fatigue, and Environmentally Assisted Fatigue (EAF) Projections for 60 Years	Rev. 1 12/22/2023
SIA 1701003.301	SI:FatiguePro4 Cycle and Fatigue 60-Year Projections	Rev. 0 05/04/2022

Document	Title	Revision / Date
SIA 1701003.304	Environmentally Assisted Fatigue Screening for Clinton	Rev. 0 10/21/2022
SIA 1701003.305	Environmentally Assisted Fatigue Calculations for Sentinel Locations at Clinton	Rev. 0 03/17/2023
SIA FP-CPS-403	SI:FatiguePro 4.0 SBF Transfer Functions for Clinton Power Station Fatigue Monitoring System	Rev. 1 04/18/2023

During the audit of the TLAAs, the staff verified that the applicant has provided its basis that supports its disposition of 10 CFR 54.21(c)(1)(iii). However, the staff found that sufficient information was not available to complete its review of the applicant's basis for TLAA disposition. In order to obtain the necessary information, the staff will consider issuing RAIs.

During the audit, the staff made the following observations.

- LRA Section 4.3.2 indicates that the screening values of environmental fatigue correction factor (F_{en}) are based on the component material, maximum operating temperature, and bounding dissolved oxygen. The LAR also indicates that sulfur content is also an input for carbon and low alloy steels component F_{en} screening values. However, LRA Section 4.3.2 does not clearly discuss how the applicant determined conservative sulfur content (for carbon and low alloy steels) and strain rates in the screening EAF evaluations. In addition, the staff needs clarification on how the applicant removed the excessive conservatism associated with the CUF_{en} values in the detailed EAF evaluation after the screening EAF evaluation.

- LRA Section 4.3.2 addresses the EAF TLAA for Class 1 piping systems. Specifically, LRA Table 4.3.1-2 describes the 60-year projected values of environmentally adjusted cumulative usage factor (CUF_{en}) for the limiting (bounding) EAF locations. However, LRA Table 4.3.1-2 does not describe the materials of the limiting locations. The staff also needs clarification on whether the applicant eliminated certain EAF locations based on the more limiting EAF locations fabricated with a different material (e.g., a low alloy steel location was eliminated in consideration of the more limiting stainless steel location in the screening evaluation for EAF). In addition, LRA Table 4.3.1-2 does not clearly describe the specific piping systems or components (e.g., specific reactor vessel components) of the limiting EAF locations.

The staff also audited the description of the Class 1 fatigue and EAF TLAAs in the FSAR supplement. The staff verified that this description is consistent with the acceptance criteria provided in SRP-LR (Revision 2) Section 4.3.2.2.

LRA TLAA Section 4.3.3, ASME Section III, Class 1 Components

Summary of Information in the Application

LRA Section 4.3.3, "ASME Section III, Class 1 Components," discusses the Class 1 fatigue TLAAs for the following piping systems and components: (1) main steam system; (2) main steam isolation valves; (3) safety and relief valves; (4) recirculation system; (5) recirculation

system flow control valves; (6) recirculation system gate valves; (7) recirculation system pumps; and (8) control rod drives.

The applicant dispositioned the fatigue TLAAs for the main steam system and recirculation system in accordance with 10 CFR 54.21(c)(1)(iii). The applicant dispositioned the fatigue TLAAs for the valves, pumps and control rod drives discussed above in accordance with 10 CFR 54.21(c)(1)(i).

To verify that the applicant provided a basis to support its dispositions of the fatigue TLAAs, the staff audited the TLAAs. The staff will address issues identified but not resolved in this audit report in the SE.

Audit Activities

During its audit, the staff interviewed the applicant's staff and reviewed documentation contained in the LRA and provided by the applicant via the ePortal. For the operating experience (OE) review, the applicant made a presentation on the process used to identify and evaluate the pertinent OE. Afterwards, the staff conducted its review of the applicant's methodology and OE by reviewing documentation contained in the LRA and ePortal.

The table below lists documents that were reviewed by the staff and were found relevant to the fatigue TLAA for the Class 1 piping systems and components. The staff will document its review of this information in the SE.

Document	Title	Revision / Date
CL-TLAABD	Time-Limited Aging Analysis (TLAA) Basis Document – Part 2 – TLAA Evaluation – Clinton LR	Rev. 0 02/06/2024
SIA FP-CPS-314	Cycle, Fatigue, and Environmentally Assisted Fatigue (EAF) Projections for 60 Years	Rev. 1 12/22/2023
VPF3948-044	Design Report for 24" Main Steam Isolation Valve	Rev. 1 02/15/1988
VPF-5529-029	Stress Report No. G471-6/125.04.07: 8 inch-1500 Cast Carbon Steel Safety Relief Valve	Rev. 8 05/02/1979
SIR-99-055	Report on System Review and Recommendations for a Transient and Fatigue Monitoring System at the Clinton Power Station	Rev. 0 08/02/1999
VPF5521-212	Design Report #638 Design Analysis of a 20-inch Flow Control Valve	Rev. 3 08/21/1979
SQ-CL731	Dynamic Qualification of Recirculation Discharge Valve 1B33-F067A/B	Rev. 5 06/21/1990
SQ-CL620	Qualification Document for Recirculation Pumps, Tab D, Stress Analysis	Rev. 5 04/25/1983

Document	Title	Revision / Date
22A4912	Control Rod Drive	Rev. 2 02/09/1991

During the audit of the TLAAs, the staff verified that the applicant has provided its basis that supports its disposition of 10 CFR 54.21(c)(1)(iii) for the main steam system and recirculation system and its disposition of 10 CFR 54.21(c)(1)(i) for the valves, pumps and control rod drives described above. However, the staff found that sufficient information was not available to complete its review of the applicant's basis for TLAA dispositions. In order to obtain the necessary information, the staff will consider issuing RAIs.

During the audit, the staff made the following observations related to LRA Section 4.3.3. As previously discussed, the applicant dispositioned the fatigue TLAAs for the main steam system and recirculation system in accordance with 10 CFR 54.21(c)(1)(iii). The applicant also dispositioned the fatigue TLAAs for the valves, pumps and control rod drives discussed above in accordance with 10 CFR 54.21(c)(1)(i). In comparison, LRA Section 4.3.2.1 addresses the fatigue analyses for the ASME Code Section III, Class 1 RPV and piping components. The applicant dispositioned these fatigue TLAAs in accordance with 10 CFR 54.21(c)(1)(iii).

It is not clear to the staff whether some of the Class 1 piping systems and components are addressed in both of the LRA sections (i.e., LRA Sections 4.3.3 and 4.3.2.1). In addition, the staff needs clarification on whether all the piping systems and components addressed in LRA Section 4.3.3 are evaluated in the EAF analysis in LRA Section 4.3.2.2.

The staff also audited the description of the fatigue TLAAs for the Class 1 piping systems and components in the FSAR supplement. The staff verified that this description is consistent with the acceptance criteria provided in SRP-LR (Revision 2) Section 4.3.2.2.

LRA TLAA Section 4.3.4, ASME Section III, Class 1 Fatigue Exemptions

Summary of Information in the Application

LRA Section 4.3.4, "ASME Section III, Class 1 Fatigue Exemptions," discusses the fatigue exemption (waiver) TLAAs for the Class 1 components. The applicant dispositioned the fatigue exemption TLAAs in accordance with 10 CFR 54.21(c)(1)(ii).

To verify that the applicant provided a basis to support its dispositions of the fatigue exemption TLAAs, the staff audited the TLAAs. The staff will address issues identified but not resolved in this audit report in the SE.

Audit Activities

During its audit, the staff interviewed the applicant's staff and reviewed documentation contained in the LRA and provided by the applicant via the ePortal. For the operating experience (OE) review, the applicant made a presentation on the process used to identify and evaluate the pertinent OE. Afterwards, the staff conducted its review of the applicant's methodology and OE by reviewing documentation contained in the LRA and ePortal.

The table below lists documents that were reviewed by the staff and were found relevant to the fatigue exemption TLAAs for the Class 1 components. The staff will document its review of this information in the SE.

Document	Title	Revision / Date
CL-TLAABD	Time-Limited Aging Analysis (TLAA) Basis Document – Part 2 – TLAA Evaluation – Clinton LR	Rev. 0 02/06/2024
SIA 1701003.302	Fatigue Exemptions (Waivers) for Clinton Class 1 Components	Rev. 0 06/29/2022

During the audit of the TLAAs, the staff verified that the applicant has provided its basis that supports its disposition of 10 CFR 54.21(c)(1)(ii). However, the staff found that sufficient information was not available to complete its review of the applicant's basis for TLAA disposition. In order to obtain the necessary information, the staff will consider issuing RAIs.

During the audit, the staff made the following observations. LRA Section 4.3.4 indicates that the fatigue exemption (waiver) analyses are based on the 60-projected cycles of the design transients described in LRA Table 4.3.1-1. Specifically, LRA Table 4.3.4-2 indicates that, with respect to the provision of ASME Code Section III, NB-3222.4(d)(1), the number of pressure cycles from atmospheric to operating conditions and back is based on 101 cycles of the "startup" transient and 44 cycles of the "hydro test" transient, which are total 145 cycles.

In contrast, LRA Table 4.3.4-2 indicates that the number of pressure cycles evaluated in the fatigue exemption analyses in relation to NB-3222.4(d)(1) is 144 cycles, which is slightly less than 145 cycles (i.e., 60-year projected cycles). Therefore, the staff needs clarification on whether the 145 pressure cycles do not affect the validity of the fatigue exemption analyses.

The staff also audited the description of the fatigue exemption TLAAs for the Class 1 components in the FSAR supplement. The staff verified that this description is consistent with the acceptance criteria provided in SRP-LR (Revision 2) Section 4.3.2.2.

LRA TLAA Section 4.3.5, ASME Section III, Class 2, Class 3, and ANSI B31.1 Allowable Stress Analyses and Related High-Energy Line Break (HELB) Selection Analyses

Summary of Information in the Application

LRA Section 4.3.4, "ASME Section III, Class 2, Class 3, and ANSI B31.1 Allowable Stress Analyses and Related HELB Selection Analyses," discusses the allowable stress and HELB selection TLAAs for the non-Class 1 piping systems. The applicant dispositioned these TLAAs in accordance with 10 CFR 54.21(c)(1)(i).

To verify that the applicant provided a basis to support its dispositions of the allowable stress and HELB selection TLAAs, the staff audited the TLAAs. The staff will address issues identified but not resolved in this audit report in the SE.

Audit Activities

During its audit, the staff interviewed the applicant's staff and reviewed documentation contained in the LRA and provided by the applicant via the ePortal. For the operating experience (OE) review, the applicant made a presentation on the process used to identify and

evaluate the pertinent OE. Afterwards, the staff conducted its review of the applicant's methodology and OE by reviewing documentation contained in the LRA and ePortal.

The table below lists documents that were reviewed by the staff and were found relevant to the allowable stress and HELB selection TLAAs for the non-Class 1 piping systems. The staff will document its review of this information in the SE.

Document	Title	Revision / Date
CL-TLAABD	Time-Limited Aging Analysis (TLAA) Basis Document – Part 2 – TLAA Evaluation – Clinton LR	Rev. 0 02/06/2024
N/A	TLAA Pipe Segment Review	N/A

During the audit of the TLAAs, the staff verified that the applicant has provided its basis that supports its disposition of 10 CFR 54.21(c)(1)(i). However, the staff found that sufficient information was not available to complete its review of the applicant's basis for TLAA disposition. In order to obtain the necessary information, the staff will consider issuing RAIs.

During the audit, the staff made the following observations. LRA Table 4.3.5-2 describes the 60-year projected cycles for each non-Class 1 piping system to confirm that the 60-year projected cycles do not exceed 7000 cycles in the implicit fatigue analysis. However, LRA Section 4.3.5 does not clearly describe how the 60-year cycles were determined (e.g., based on piping system design information, plant operation procedures, test requirements, FSAR information and specific system-level knowledge).

The staff also audited the description of the allowable stress and HELB selection TLAAs for the non-Class 1 piping systems in the FSAR supplement. The staff verified that this description is consistent with the acceptance criteria provided in SRP-LR (Revision 2) Section 4.3.2.2.

LRA TLAA Section 4.3.6, High-Energy Line Break (HELB) Analyses Based On Cumulative Fatigue Usage

Summary of Information in the Application

LRA Section 4.3.6, "High-Energy Line Break (HELB) Analyses Based On Cumulative Fatigue Usage," discusses the HELB TLAA based on the cumulative usage factor (CUF) for the Class 1 piping systems. The applicant dispositioned these TLAA in accordance with 10 CFR 54.21(c)(1)(iii).

To verify that the applicant provided a basis to support its dispositions of the CUF-based HELB TLAA for the Class 1 piping systems, the staff audited the TLAAs. The staff will address issues identified but not resolved in this audit report in the SE.

Audit Activities

During its audit, the staff interviewed the applicant's staff and reviewed documentation contained in the LRA and provided by the applicant via the ePortal. For the operating experience (OE) review, the applicant made a presentation on the process used to identify and

evaluate the pertinent OE. Afterwards, the staff conducted its review of the applicant's methodology and OE by reviewing documentation contained in the LRA and ePortal.

The table below lists documents that were reviewed by the staff and were found relevant to the CUF-based HELB TLAA for the Class 1 piping systems. The staff will document its review of this information in the SE.

Document	Title	Revision / Date
CL-TLAABD	Time-Limited Aging Analysis (TLAA) Basis Document – Part 2 – TLAA Evaluation – Clinton LR	Rev. 0 02/06/2024
N/A	HELB Breakdown	N/A

During the audit of the TLAAs, the staff verified that the applicant has provided its basis that supports its disposition of 10 CFR 54.21(c)(1)(iii).

The staff also audited the description of the CUF-based HELB TLAA for the Class 1 components in the FSAR supplement. The staff verified that this description is consistent with the acceptance criteria provided in SRP-LR (Revision 2) Section 4.3.2.2.

LRA TLAA Section 4.3.7, Reactor Vessel Internals

Summary of Information in the Application

LRA Section 4.3.7, "Reactor Vessel Internals," discusses the fatigue TLAAs for the reactor vessel internal (RVI) components that support the reactor core.

The applicant dispositioned the fatigue TLAAs for the core plate stiffener to skirt weld and top guide/grid in accordance with 10 CFR 54.21(c)(1)(i). The applicant dispositioned the fatigue exemption TLAAs for the control rod guide tubes, peripheral fuel support and orificed fuel support in accordance with 10 CFR 54.21(c)(1)(ii). The applicant also dispositioned the fatigue TLAAs for the core shroud support structure and core shroud stabilizer assembly brackets in accordance with 10 CFR 54.21(c)(1)(ii). In addition, the applicant dispositioned the fatigue TLAAs for the jet pump riser brace and core spray piping in accordance with 10 CFR 54.21(c)(1)(iii).

To verify that the applicant provided a basis to support its dispositions of the TLAAs, the staff audited the TLAAs. The staff will address issues identified but not resolved in this audit report in the SE.

Audit Activities

During its audit, the staff interviewed the applicant's staff and reviewed documentation contained in the LRA and provided by the applicant via the ePortal. For the operating experience (OE) review, the applicant made a presentation on the process used to identify and evaluate the pertinent OE. Afterwards, the staff conducted its review of the applicant's methodology and OE by reviewing documentation contained in the LRA and ePortal.

The table below lists documents that were reviewed by the staff and were found relevant to the TLAAs for the RVI components. The staff will document its review of this information in the SE.

Document	Title	Revision / Date
CL-TLAABD	Time-Limited Aging Analysis (TLAA) Basis Document – Part 2 – TLAA Evaluation – Clinton LR	Rev. 0 02/06/2024
EPU-T0303-01	Extended Power Uprate: Task T0303, RPV Internals Structural Integrity Evaluation Core Support Structure Components (Proprietary)	Rev. 0 03/06/2002
EPU-T0303-02	Extended Power Uprate: Task T0303-02, RPV Internals Structural Integrity Evaluation Non-Core Support Structure Components (Proprietary)	Rev. 2 10/10/2018
GE 007N4023	Clinton PCR Item 2 Reactor Internals Transient Cycles Report (Proprietary)	Rev. 0 01/2023
SIA 1701003.302	Fatigue Exemptions (Waivers) for Clinton Class 1 Components	Rev. 0 06/29/2022
GE-NE-26A-6217	Shroud and Shroud Support Structure (Proprietary)	Rev. 0 03/09/2005

During the audit of the TLAAs, the staff verified that the applicant has provided its basis that supports its TLAA disposition as follows: (1) disposition of 10 CFR 54.21(c)(1)(i) for the core plate stiffener to skirt weld and top guide/grid; (2) disposition of 10 CFR 54.21(c)(1)(ii) for the control rod guide tubes, peripheral fuel support and orificed fuel support (fatigue exemption analyses); (3) disposition of 10 CFR 54.21(c)(1)(ii) for the core shroud support structure and core shroud stabilizer assembly brackets (fatigue analyses); and (4) disposition of 10 CFR 54.21(c)(1)(iii) for the jet pump riser brace and core spray piping. However, the staff found that sufficient information was not available to complete its review of the applicant's basis for TLAA dispositions. In order to obtain the necessary information, the staff will consider issuing RAIs.

During the audit, the staff made the following observations. The LRA explains that the 40-year CUF for the core shroud support plate, which is the limiting location for the core shroud support structure and core shroud stabilizer assembly, is 0.426. The LRA indicates that the CUF value is based on safety relief valve (SRV) actuation transient cycles, which are greater than 12000 cycles in the 40-yearfatigue analysis. The LRA also explains that the SRV actuation transient is the most significant contributor to fatigue in the core shroud support plate.

In contrast, the following reference indicates that the most significant contribution to the 40-year CUF is due to thermal cycles (i.e., contribution of 0.406 due to certain thermal cycles) (Reference: GE-NE-26A-6217, "Shroud and Shroud Support Structure," Section 6.2.5.2, Revision 0, March 9, 2005). The reference also indicates that the calculation of the CUF contribution (0.406) is based on the maximum usage factor in the shroud support plate for a similar standard BWR/6 plant.

The reference further explains that the 40-year CUF contribution of the SRV actuation cycles to the core shroud support plate is approximately 0.013 and the 40-year CUF contribution of other thermal transients is less than 0.01. However, the LRA does not clearly discuss whether the

transient cycles evaluated for the standard plant reasonably represent the 40-year transient cycles of the Clinton Power Station.

The staff also audited the description of the fatigue TLAAs for the RVI components in the FSAR supplement. The staff verified that this description is consistent with the acceptance criteria provided in SRP-LR (Revision 2) Section 4.3.2.2.

LRA TLAA Section 4.4, Environmental Qualification of Electric and Mechanical Equipment

Summary of Information in the Application

LRA Section 4.4, “Environmental Qualification of Electric and Mechanical Equipment,” discusses the thermal, radiation, and cyclical aging analyses for the plant electrical and mechanical components. The applicant dispositioned the TLAA in accordance with 10 CFR 54.21(c)(1)(iii).

Audit Activities

An on-site audit was performed September 10 to September 12, 2024.

The table below lists documents that were reviewed by the staff and were found relevant to the TLAA. The staff will document its review of this information in the SE.

Document	Title	Revision / Date
CL-TLAABD	4.4 Environmental Qualification of Electric and Mechanical Equipment	Rev. 0
AR 04775740	LR: Enhance CPS EQ Program to Support 60 Year Ops	Print date 09/12/2024
AR 04776265	LR: EQ Process Radiation Monitors	Print date 09/12/2024
AR 02537305	10 CFR Part 21 NAMCO EA180 and EA170 limit Switches	Print date 05/30/2024
AR 02541236	Part 21: NAMCO Limit Switch (EA170/EA180)	Print date 05/30/2024
AR 04431409	NOS ID: Develop work down curve for EQ Binder revisions	Print date 05/30/2024
AR 04675921	EQ Program Document Issues	Print date 05/30/2024
CC-AA-203 (Markup)	Environmental Qualification Program (Constellation Proprietary)	Rev. 17
NSED Procedure E.6	Environmental Qualification Packages (Constellation Proprietary)	Rev. 13
NSED-MEQPM-MS-02.00	Maintenance of Equipment Qualification Program Manual (Constellation Proprietary)	10/19/2018
EC 0000636711	RWCU Differential Flow modification	03/13/2024

Document	Title	Revision / Date
CPS EQ Challenges (IR #: 4776265)	EQ-CL016 – Eberline SR Process Radiation Monitoring System	08/19/2024
EQ-CL003 Tab C	Analysis, Calculation, or Justification to Support Qualification	Rev. 14
EQ-CL011 Tab C	Analysis, Calculation, or Justification to Support Qualification	Rev. 22
EQ-CL037 Tab C	Analysis, Calculation, or Justification to Support Qualification	Rev. 08
EQ-CL068 Tab C	Analysis, Calculation, or Justification to Support Qualification	Rev. 11
EQ-CL093 Tab C	Analysis, Calculation, or Justification to Support Qualification	Rev. 16
EQ-CL015 Tab C	Analysis, Calculation, or Justification to Support Qualification	Rev. 03

During the audit of the TLAA, the staff verified that the applicant has provided its basis that supports its disposition of 10 CFR 54.21(c)(1)(iii).

The staff also audited the description of the LRA Environmental Qualification of Electric and Mechanical Equipment provided in the FSAR supplement. The staff verified this description is consistent with the description provided in the SRP-LR.

LRA TLAA Section 4.6, Primary Containment Fatigue Analyses

Summary of Information in the Application

LRA Section 4.6.1 “Containment Class MC Mechanical Penetrations,” discusses the fatigue analyses for the Containment Class MC Mechanical Penetrations. The applicant dispositioned the TLAA in accordance with 10 CFR 54.21(c)(1)(i) for 119 of the existing 121 containment penetration fatigue evaluations and 10 CFR 54.21(c)(1)(ii) for two of the existing 121 containment penetration fatigue evaluations.

LRA Sections 4.6.2 “Containment Liner,” 4.6.3 “Suppression Pool Liner,” 4.6.4 “Containment and Drywell Equipment Hatch and Personnel Locks, and Dry well Head Fatigue Assessment,” 4.6.5 “Inclined Fuel Transfer Tube Bellows,” 4.6.6 “Refueling Bellows,” 4.6.7 “SRV X-Quenchers,” 4.6.8 “Containment/Drywell Penetration High Energy Guard Pipe Bellows,” and 4.6.11 “ECCS Suction Strainer Bellows,” discusses the fatigue analyses for the containment liner, suppression pool liner, containment and drywell equipment hatch and personnel locks, and dry well head, inclined fuel transfer tube bellows, refueling bellows, SRV X-Quenchers, containment/drywell penetration high energy guard pipe bellows, and ECCS suction strainer bellows, respectively. The applicant dispositioned the TLAA in accordance with 10 CFR 54.21(c)(1)(i).

LRA Section 4.6.9 “Containment Liner Corrosion Assessment,” discusses the fatigue analysis for the Containment Liner Corrosion. The applicant dispositioned the TLAA in accordance with 10 CFR 54.21(c)(1)(ii).

LRA Section 4.6.10 “Containment Electrical Penetration,” discusses the fatigue analysis for the Containment Electrical Penetration. The applicant dispositioned the TLAA in accordance with 10 CFR 54.21(c)(1)(iii).
To verify that the applicant provided a basis to support its disposition of the TLAAs, the staff audited the TLAAs. The staff will address issues identified but not resolved in this audit report in the SE.

Audit Activities

During its audit, the staff interviewed the applicant’s staff and reviewed documentation contained in the LRA and provided the applicant via the ePortal.

For the operating experience (OE) review, the applicant made a presentation on the process used to identify and evaluate the pertinent OE. Afterwards, the staff conducted its review of the applicant’s methodology and OE by reviewing documentation contained in the LRA and ePortal.

The table below lists documents that were reviewed by the staff and were found relevant to the TLAA. The staff will document its review of this information in the SE.

Document	Title	Revision / Date
Review of Mechanical Penetrations Assessment for 60 years	Clinton Containment Mechanical Penetrations Breakdown	05/16/2023
Penetrations Breakdown Attachment 1	Clinton Containment Mechanical Penetrations Breakdown	05/13/2023
CQD-4536-1PC0065	Penetration Stress Analysis Report – Primary Containment Penetration 1PC0065	Rev. 2
CQD-4536-1PC0064	Penetration Stress Analysis Report – Primary Containment Penetration 1PC0064	Rev. 5
CQD-4536-1PC0017	Penetration Stress Analysis Report – Primary Containment Penetration 1PC0017	Rev. 2 04/20/1990
CQD-4536-1AB0111	Penetration Stress Analysis Report – Primary Containment Penetration 1AB0111	Rev. 2
SDQ12-42DG07	Containment/Reactor Building Containment Liner Special Problems	Rev. 0 03/11/1991

Document	Title	Revision / Date
22A7000	238 Nuclear Island GESSAR II	Rev. 1
SD-Q12-42DG02	Containment/Reactor Building Containment Liner Floor Liner Design	Rev. 3 06/08/1998
EC-0000638891	Clinton Containment/Drywell Equipment Hatch, Personnel Locks, and head Fatigue Assessment	Rev. 0 06/01/2023
SQ-CL502	Containment Bellows for The Inclined Transport System	Rev. 1 02/06/1985
K-2893	Technical Specification for Refueling Bellows	Rev. 6 09/20/1982
21A2139	Design Specification for Quencher, X-Type, Pedestal Mounted	06/01/1978
Letter Dated Oct 31, 1984 (Docket No. 50-461)	Potential Deficiency 55-83-08 10CFR50.55(e) Damage to Guard Pipe Bellows Assemblies	10/31/1984
SDQ12-42DG11	Containment Liner – Corrosion of Liner	Rev. 0 12/03/1992
2201232.401.R0	Clinton Containment Liner Corrosion Rate Assessment	Rev. 0 08/09/2023
2201232.301.R0	Clinton Containment Liner Corrosion Allowance and Margin Assessment	Rev. 0 08/10/2023
CL-LR-SIA-005	Attachment 2 Clinton Containment Humidity at Elevation 735 foot	Rev. 1
SQ-CL373	Medium Voltage Electrical Penetration	Rev. 1 06/14/1985
SQ-CL433	Airlock Penetration for Lighting and Telephone Service	Rev. 4 06/13/1985
SQ-CL375	Low Voltage Power Electric Penetrations	Rev. 0 06/13/1985
SQ-CL372	Low Voltage Control and Instrumentation Penetrations	Rev. 3 06/12/1990
K-2888B	Technical Specification for ECCS Suction Strainer	Rev. 1 03/23/1998

During the audit of the TLAA, the staff verified that the applicant has provided its basis to support its dispositioning of 10 CFR 54.21(c)(1)(i), (ii) and (iii). However, the staff found that sufficient information was not available to complete its review of the applicant's basis for its TLAA disposition. In order to obtain the necessary information, the staff will consider issuing RAIs or use a voluntary LRA supplement offered by the applicant during the audit.

During the audit, the staff made the following observations:

- The staff reviewed “Review of Mechanical Penetrations Assessment for 60 years,” and noted that the LRA conservatively assumed that the RWCU heat exchangers are swapped 10 times per year for 60 years, resulting in 600 occurrences, which is significantly larger than the original assumption of 20 RWCU heat exchanger swaps over the initial 40 years as assumed in CQD-4536-1PC0064. The staff further noted that the LRA conservatively assumed that the backwash transient occurs 10 times per day for 60 years, resulting in 10,950 occurrences, which is significantly larger than the original assumption of 2,450 occurrences over the initial 40 years (once every 6 days) as assumed in CQD-4536-1PC0065.

- The staff reviewed Calculations CQD-4536-1PC0017 and CQD-4536-1AB0111 and noted that the contribution of the “Hydro Test” transient and the “Misc. Head Spray” transient to the overall Cumulative Usage Factor (CUF) is negligible.

- The staff reviewed Calculation CQD-4536-1PC0064 and noted that this calculation determined a CUF of 0.5901 (PDF page 36) assuming 1) 123 boltup transients (70 to 437), 2) 10,000 normal operation transients (SS at 437), 3) 20 RT heat exchanger swap transients (437, 260, 525, 475, 380, 430), 4) 500 filter demin off/on transients (435 to 480), and 5) 130 unbolt transients (480 to 70) – PDF 75.

- The staff reviewed Calculation CQD-4536-1PC0065 and noted that this calculation determined a CUF value of 0.01245 (PDF 34) assuming 1) 10,000 pump standby transients at 65F (SS), 2) 2450 backwash transients from 65F to 120F and back to 65F. The assumption of 2450 transients in 40 years results in a backwash transient approximately every 6 days.

- The staff reviewed Calculation SDQ12-42DG07 and noted that the containment liner and associated welds were qualified for 1948 SRV actuations over 40 years.

- The staff reviewed Calculation 22A7000 and noted that the suppression liner was qualified for 1800 SRV actuations over 40 years. The staff also reviewed SD-Q12-42DG02 and noted that the design analysis evaluated fatigue for the suppression pool floor liner by addressing the six criteria in NE-3222.4(d) assuming 1,000 SRV actuations during the 40-year life of the plant.

- The staff reviewed EC-0000638891 and noted that Constellation evaluated containment and drywell equipment hatch and personnel locks, and drywell head for 2500 occurrences in which the component experiences a temperature and pressure increase from ambient to operating temperature and pressure per the six criteria in NE-3222.4(d) and demonstrated that these five components were exempted from a more detailed fatigue evaluation in accordance with NE-3222.4(e).

- The staff reviewed Page 64 of SQ-CL502 and noted that the projected thermal cycles for 40 years of operation for the three design conditions (normal operation, upset conditions, and faulted conditions) of the inclined fuel transfer tube bellows stated in the LRA Section 4.6.5 were 150, 30, and 1, respectively. The staff further noted that the design temperature and pressure of 185 °F and 20 psig were used for the three design conditions.

- The staff reviewed Page 31 of Technical Specification K-2893 and noted that refueling bellows were qualified for a minimum of 360 occurrences of axial compression corresponding to the thermal expansion of the RPV during normal operational startups and shutdowns, three cycles of axial compression corresponding to the thermal expansion of the RPV during accident conditions and a minimum of 30 OBE and 30 SSE seismic cycles of horizontal and vertical movement.
- The staff reviewed Page 10 of 21A2139 and noted that the SRV X-Quenchers were qualified for 11,600 SRV actuations, five OBEs, and one SSE over 40 years.

- The staff reviewed Page 3 of Letter Dated Oct 31, 1984 (Docket No. 50-461), "Potential Deficiency 55-83-08 10CFR50.55(e) Damage to Guard Pipe Bellows Assemblies," and noted that the prototype assembly was tested by imposing greater than 10,000 cycles of calculated movement.

- The staff reviewed Sheet 8 of SDQ12-42DG11and noted that Constellation performed a conservative analysis to estimate the amount of corrosion on the uncoated liner surfaces under the test channel and concluded that the estimated conservative material loss over 40 years was less than the acceptance criteria. Based on its review of 2201232.301.R0, the staff verified that the total material loss estimate of 3.5 mils for carbon steel surfaces for 60 years of exposure is significantly less than the acceptance criteria of 125 mils of local thinning under the test channels. In addition, based on its review of 2201232.401.R0 and CL-LR-SIA-005, the staff verified the screening basis for galvanic corrosion for areas where carbon steel liner plates are attached to stainless steel liner plates, based on the availability of containment ventilation system maintaining containment environment temperatures above the dew point and no OE incidents of corrosion.

- The staff reviewed Section 5.6 of SQ-CL372, SQ-CL375 and SQ-CL433 and Section 7.10 of SQ-CL373 and verified that electrical penetrations were qualified for 120 startups and shutdowns in which penetration temperature was increased from ambient to 150 °F. The staff reviewed Appendix E, Page 1 of 3, of K-2888B, Revision 1 and verified that ECCS suction strainer bellows were qualified for a minimum of 12,600 occurrences of axial and lateral movements that encompassed thermal, seismic, SRV and LOCA.

The staff also audited the descriptions of the LRA TLAAs for Primary Containment Fatigue Analyses provided in the FSAR supplement in LRA Section A.4.6. The staff found that sufficient information was not available to determine whether the descriptions provided in the USAR supplement were adequate descriptions of the LRA TLAAs "Primary Containment Fatigue Analyses." The staff will consider issuing RAIs or use a voluntary supplement offered by the applicant during the audit in order to obtain the information necessary to verify the sufficiency of the FSAR supplement program descriptions.

LRA TLAA Section 4.7.1, "CPS Crane Cyclic Loading Analyses TLAA"

Summary of Information in the Application

The LRA Section 4.7.1, "CPS Crane Cyclic Loading Analyses TLAA" discusses the analyses for the Containment Polar Crane and Fuel Building Crane. The applicant dispositioned the TLAAs in accordance with 10 CFR 54.21(c)(1)(i).

To verify that the applicant provided a basis to support its disposition of the TLAA, the staff audited the TLAA.

Audit Activities

During its audit, the staff interviewed the applicant's staff and reviewed documentation contained in the LRA and provided by the applicant via the ePortal.

For the operating experience (OE) review, the applicant made a presentation on the process used to identify and evaluate the pertinent OE. Afterwards, the staff conducted its review of the applicant's methodology and operating experience by reviewing documentation contained in the LRA and ePortal.

The table below lists documents that were reviewed by the staff and were found relevant to the program. The staff will document its review of this information in the SE.

Document	Title	Revision / Date
CL-TLAABD	TLAA Basis Document: Part 2 – TLAA Evaluation – Clinton LR	Rev. 0
FSAR	CPS Final Safety Analysis Report	Rev. 23
MA-AA-716-021	Rigging and Lifting Program (Constellation Proprietary)	Rev. 36
MA-AA-716-022	Control of Heavy Loads Program (Constellation Proprietary)	Rev. 15
AR 02436853	1HC02G: 1 loose bolt found during crane inspection	01/13/2015
AR 04282958	Minor discrepancies during refuel bridge (F15) walkdown	09/27/2019
ECR 417375	WO 1710259-01 inspection 1 loose bolt was found	01/14/2015
AR 03987841	Investigate leak from crane	03/21/2017
AR 04209989	N and S TB overhead cranes safety mitigation	01/11/2019
AR 02436853	1HC02G: 1 loose bold found during crane inspection - bolt is located on the west site. G-104 on the crane rail upper	01/13/2015

During the audit of the TLAA, the staff verified that the applicant has provided its basis that supports its disposition of 10 CFR 54.21(c)(1)(i).

The staff also audited the description of the LRA provided in the FSAR supplement in Section A.2,1.14, "CPS Crane Cyclic Loading Analyses TLAA." The staff verified this description is consistent with the description provided in the SRP for TLAAs.

LRA TLAA Section 4.7.2, Main Steam Line Flow Restrictor Erosion Analysis

Summary of Information in the Application

LRA Section 4.7.2, "Main Steam Line Flow Restrictor Erosion Analysis," discusses the analysis of the main steam line flow restrictors during a main steam line break outside of primary containment. The applicant dispositioned the TLAA in accordance with 10 CFR 54.21(c)(1)(i).

Audit Activities

The table below lists documents that were reviewed by the staff and were found relevant to the TLAA. The staff will document its review of this information in the SE.

Document	Title	Revision / Date
CL-TLAABD	TLAA Basis Document – Section 4.7.2 Main Steam Line Flow Restrictors Erosion Analysis	Rev. 0
NUREG-0800	Standard Review Plan – Section 15.6.4 Radiological Consequences of Main Steam Line Failure Outside Containment (BWR)	Rev. 2

During the audit of the TLAA, the staff verified that the applicant has provided its basis that supports its disposition of 10 CFR 54.21(c)(1)(i).

The staff also audited the description of the Main Steam Line Flow Restrictors Erosion Analysis provided in the FSAR supplement. The staff verified this description is consistent with the description provided in the SRP-LR.

LRA TLAA Section 4.7.3, Generic Letter 81-11 Crack Growth Analysis to Demonstrate Conformance to the Intent of NUREG-0619

Summary of Information in the Application

LRA Section 4.7.3, “Generic Letter 81-11 Crack Growth Analysis to Demonstrate Conformance to the Intent Of NUREG-0619,” discusses the analysis related to crack growth for the feedwater nozzles of the RPV. The applicant dispositioned the TLAA in accordance with 10 CFR 54.21(c)(1)(i).

Audit Activities

The table below lists documents that were reviewed by the staff and were found relevant to the TLAA. The staff will document its review of this information in the SE.

Document	Title	Revision / Date
CL-TLAABD	Clinton Power Station License Renewal Project – TLAA Basis Document – Part 2 – TLAA Evaluation (Section 4.7 – Other Plant-Specific Time-Limited Aging Analyses)	Rev. 0
CL-TLAABD	Clinton Power Station License Renewal Project – TLAA Basis Document – Part 2 – TLAA Evaluation (Section 4.3 – Metal Fatigue Analyses)	Rev. 0
IP-M-0715	Post Power Uprate Feedwater Nozzle Fracture Mechanics Analysis to show compliance with NUREG-0619 – (DRF 000-0003-7901-01 – May 2002)	Rev.0

Document	Title	Revision / Date
FP-CPS-314	Cycle, Fatigue, and Environmentally Assisted Fatigue (EAF) Projections for 60 Years	Rev. 1
ER-AA-470	Fatigue and Transient Monitoring Program (Constellation Proprietary)	Rev. 10

During the audit of the TLAA, the staff verified that the applicant has provided its basis that supports its disposition of 10 CFR 54.21(c)(1)(i).

During the audit, the staff made the following observations:

- The staff confirmed that the applicant reassessed the plant-specific fracture mechanics analysis to account for uprated plant conditions to demonstrate continued compliance with NUREG-0619 and Generic Letter 81-11 (i.e., IP-M-0715);

- The staff confirmed that this plant-specific fracture mechanics analysis, incorporating the uprated conditions at CPS, assumed a specified number of startup, shutdown and scram occurrences intended to bound original 40-year operating period;

- The staff confirmed that the 60-year cycle projections were based on historical plant-specific operating characteristics and anticipated future operation (i.e., FP-CPS-314);

- The staff confirmed that the assumed number of transient occurrences in this plant-specific fracture mechanics analysis were considerably greater than the 60-year projections presented in LRA 4.3.1-1 for the same design transients.

The staff also audited the description of the TLAA provided in the FSAR supplement. The staff verified this description is consistent with the description provided in the SRP-LR.

LRA TLAA Section 4.7.4, Reactor Shield Wall Fluence

Summary of Information in the Application

LRA Section 4.7.4, “Reactor Shield Wall Fluence,” discusses the fluence evaluation for the reactor shield wall. The applicant dispositioned the TLAA in accordance with 10 CFR 54.21(c)(1)(i).

Audit Activities

During its audit, the staff interviewed the applicant’s staff and reviewed documentation contained in the LRA and provided by the applicant via the ePortal.

The table below lists documents that were reviewed by the staff and were found relevant to the TLAA. The staff will document its review of this information in the SE.

Document	Title	Revision / Date
GEH Report No. 007N1817 Proprietary	Constellation Energy Group—Clinton Power Station, License Renewal Application, Task T0313 RPV Flux Evaluation	Rev. 0 10/2022

Sargent & Lundy Drawing No. MO1-1112	General Arrangement, Fuel Bldg. & Containment Section “G-G” – Clinton Power Station, Unit 1	Rev. D
EPRI Report 1015078 Proprietary	Plant Support Engineering: Aging Effects for Structures and Structural Components (Structural Tools)	12/2007
Responses to breakout questions	Item #4 (TRP-116.4) and Item #18 (TRP-116.4)	N/A
CPS-FLU-001-R-003r0_RVE	Clinton Power Station Reactor Vessel Externals Radiation Evaluation with Projections to 52 EFPY – 2024 (Constellation Proprietary)	Rev. 0 03/2024

During the audit of the TLAA, the staff verified that the applicant has provided its basis that supports its disposition of 10 CFR 54.21(c)(1)(i).

During the audit, the staff made the following observations:

- Proprietary GEH Report No. 007N1817 states the 60-year projected neutron fluence value for the reactor shield wall inner surface to be below a certain value.
- Sargent & Lundy Drawing No. MO1-1112 shows no lateral connections between the Clinton Unit 1 RPV and the reactor shield wall.
- The response to the breakout question in “Item #4 (TRP-116.4)” states that the 1973 revision to Section 3.8.3.6 of the FSAR “documented a different threshold of 10E19 nvt” and that this threshold was revised to 10E22 nvt in FSAR Amendment 37. During the audit discussion regarding the response, the applicant committed to providing a supplement to revise the embrittlement threshold.
- CPS-FLU-001-R-003r0_RVE documented the methodology used to calculate the neutron fluence and gamma dose to the reactor shield wall including the steel liner and confirms the conclusions related to neutron fluence in GEH Report No. 007N1817.

The staff also audited the description of the LRA Section A.4.7.4, “Reactor Shield Wall Fluence” provided in the FSAR supplement. The staff verified this description is consistent with the description provided in the SRP-LR.

LRA TLAA Section 4.7.5, Hydraulic Control Units

Summary of Information in the Application

LRA Section 4.7.5, “Hydraulic Control Units,” discusses the fatigue TLAA for the hydraulic control units. The applicant dispositioned the TLAA in accordance with 10 CFR 54.21(c)(1)(i). To verify that the applicant provided a basis to support its disposition of the TLAA, the staff audited the TLAA. The staff will address issues identified but not resolved in this audit report in the SE.

Audit Activities

During its audit, the staff interviewed the applicant's staff and reviewed documentation contained in the LRA and provided by the applicant via the ePortal.

For the operating experience (OE) review, the applicant made a presentation on the process used to identify and evaluate the pertinent OE. Afterwards, the staff conducted its review of the applicant's methodology and OE by reviewing documentation contained in the LRA and ePortal.

The table below lists documents that were reviewed by the staff and were found relevant to the fatigue TLAA for the hydraulic control units. The staff will document its review of this information in the SE.

Document	Title	Revision / Date
CL-TLAABD	Time-Limited Aging Analysis (TLAA) Basis Document – Part 2 – TLAA Evaluation – Clinton LR	Rev. 0 2/6/2024
GE 22A4168	Hydraulic Control Unit (Proprietary)	Rev. 2 12/13/1978
GE 22A4309	Riser Assemblies (Proprietary)	Rev. 0 4/26/1976

During the audit of the TLAA, the staff verified that the applicant has provided its basis that supports its disposition of 10 CFR 54.21(c)(1)(i). However, the staff found that sufficient information was not available to complete its review of the applicant's basis for TLAA disposition. In order to obtain the necessary information, the staff will consider issuing RAIs.

During the audit, the staff made the following observations. FSAR Section 3.9.1.1.3 indicates that the following design cycles related to scrams were evaluated in the existing fatigue analysis for the HCUs: (1) 140 cycles of the "scram test" transient; (2) 160 cycles of "startup scram" transient; and (3) 300 cycles of "operational scram" transient. However, LRA Section 4.7.5 does not clearly describe the 60-year projected cycles for these scram transients compared to the transient cycles evaluated in the existing fatigue analysis.

The staff also audited the description of the fatigue TLAA for the hydraulic control units in the FSAR supplement. The staff verified that this description is consistent with the acceptance criteria provided in SRP-LR (Revision 2) Section 4.3.2.2.

LRA TLAA Section 4.7.6, Fuel Pool Storage Rack Fatigue Analysis

Summary of Information in the Application

LRA Section 4.7.6, "Fuel Pool Storage Rack Fatigue Analysis," discusses the analysis for the new fuel storage racks installed in the mid 2000's for the spent fuel pool. The applicant dispositioned the TLAA in accordance with 10 CFR 54.21(c)(1)(i).

Audit Activities

In addition to the OE documentation contained in the LRA and ePortal, the staff observed the applicant's search of its operating experience database using the keywords. An on-site audit was performed from September 10, 2024, to September 12, 2024.

The table below lists documents that were reviewed by the staff and were found relevant to the TLAA. The staff will document its review of this information in the SE.

Document	Title	Revision / Date
CL-TLAABD	Time-Limited Aging Analysis (TLAA) Basis Document – Part 2 – TLAA Evaluation – Clinton LR	Rev. 0
FSAR	Clinton Power Station Final Safety Analysis Report	Rev. 23
0000349325	Spent Fuel Storage Capacity Expansion, Phase 1 – Cask Storage Pool	Rev. 002
01FC34	Rack Fatigue Analysis for Clinton Spent Fuel Racks – Holtec Calculation HI-2033100 (Proprietary)	Rev. 001
HI-2033124	Spent Fuel Storage Expansion at Clinton Power Station – Holtec International Report No. HI-2033124 (Proprietary)	Rev. 2

During the audit of the TLAA, the staff verified that the applicant has provided its basis that supports its disposition of 10 CFR 54.21(c)(1)(i).

The staff also audited the description of the LRA TLAA “Fuel Pool Storage Rack Fatigue Analysis” provided in the FSAR supplement. The staff verified this description is consistent with the description provided in the SRP-LR.

LRA TLAA Section 4.7.7, Refueling Bulkhead Ring Flaw Evaluation

Summary of Information in the Application

LRA Section 4.7.7, “Refueling Bulkhead Ring Flaw Evaluation,” discusses the analysis for the crack indications in the weldments of the refueling bulkhead ring plates. The applicant dispositioned the TLAA in accordance with 10 CFR 54.21(c)(1)(i).

Audit Activities

In addition to the OE documentation contained in the LRA and ePortal, the staff observed the applicant’s search of its operating experience database using the keywords. An on-site audit was performed from September 10, 2024, to September 12, 2024.

The table below lists documents that were reviewed by the staff and were found relevant to the TLAA. The staff will document its review of this information in the SE.

Document	Title	Revision / Date
CL-TLAABD	Time-Limited Aging Analysis (TLAA) Basis Document – Part 2 – TLAA Evaluation – Clinton LR	Rev. 0
NRC Docket No. STN 50-461	Clinton Power Station Updated Safety Analysis Report	Rev. 23
CQD-005346	Structural Integrity of Refueling Bellows Ring Against Crack Propagation in Weldment Flaws	Rev. 0
CQD-002857	Fracture Mechanics Evaluation of Crack Propagation in Weldment Flaws in Refueling Bellows (RPV) Ring	Rev. 0

Document	Title	Revision / Date
PC-01 and PC-02	System Big Notes – Primary Containment	Rev. 1
4402.01	Emergency Operating Procedure-6 Primary Containment Control (Constellation Proprietary)	Rev. 31
5068.03	Alarm Panel 5068 Annunciators – Row 3 (Constellation Proprietary)	Rev. 26a
DC-ME-09-CP	Equipment Environmental Design Conditions Design Criteria	Rev. 13

During the audit of the TLAA, the staff verified that the applicant has provided its basis that supports its disposition of 10 CFR 54.21(c)(1)(i).

The staff also audited the description of the LRA TLAA "Refueling Bulkhead Ring Flaw Evaluation" provided in the FSAR supplement. The staff verified this description is consistent with the description provided in the SRP-LR.

LRA TLAA Section 4.7.8, Fuel Pool Cleanup System, Flow Control Valves

Summary of Information in the Application

LRA Section 4.7.8, "Fuel Pool Cleanup System, Flow Control Valves," discusses the fatigue TLAA for the flow control valves of the fuel pool cleanup system. The applicant dispositioned the TLAA in accordance with 10 CFR 54.21(c)(1)(i). To verify that the applicant provided a basis to support its disposition of the TLAA, the staff audited the TLAA. The staff will address issues identified but not resolved in this audit report in the SE.

Audit Activities

During its audit, the staff interviewed the applicant's staff and reviewed documentation contained in the LRA and provided by the applicant via the ePortal. For the operating experience (OE) review, the applicant made a presentation on the process used to identify and evaluate the pertinent OE. Afterwards, the staff conducted its review of the applicant's methodology and OE by reviewing documentation contained in the LRA and ePortal.

The table below lists documents that were reviewed by the staff and were found relevant to the fatigue TLAA for the flow control valves of the fuel pool cleanup system. The staff will document its review of this information in the SE.

Document	Title	Revision / Date
CL-TLAABD	Time-Limited Aging Analysis (TLAA) Basis Document – Part 2 – TLAA Evaluation – Clinton LR	Rev. 0 02/06/2024
Calculation CQD-025544	Fatigue Analysis of Valve Nos. 1FC004A, B	Rev. 0 11/18/1985

During the audit of the TLAA, the staff verified that the applicant has provided its basis that supports its disposition of 10 CFR 54.21(c)(1)(i). However, the staff found that sufficient information was not available to complete its review of the applicant's basis for TLAA disposition. In order to obtain the necessary information, the staff will consider issuing RAIs.

During the audit, the staff made the following observations. LRA Section 4.7.8 indicates that the fatigue analysis for the flow control valves assumed the transient cycles (occurrences) as follows: (1) 87600 cycles of operational loads; (2) 14790 cycles of SRV lifts; (3) 5 cycles of operational basis earthquake (OBE); and (4) one cycles of safe shutdown earthquake (SSE). However, the following reference indicates that 76990 cycles of operational loads were evaluated in the fatigue analysis for these valves (Reference: Calculation CQD-025544, "Fatigue Analysis of Valve Nos. 1FC004A, B," Revision 0, November 18, 1985, PDF file page 39 of 42).

Given the apparent inconsistency of the operational loading cycles between the LRA section and the reference document (i.e., 87600 and 76990 cycles), the staff needs clarification on the cycles of operational loading evaluated in the fatigue analysis for the flow control valves. In addition, LRA Section 4.7.8 indicates that LRA Table 4.3.1-1 documents 60-year cycle projections for SRV lift, OBE, and SSE transients. However, the LRA section does not clearly describe which specific transients in LRA Table 4.3.1-1 correspond to the SRV lift transient evaluated in LRA Section 4.7.8.

The staff also audited the description of the fatigue TLAA for the flow control valves in the FSAR supplement. The staff verified that this description is consistent with the acceptance criteria provided in SRP-LR (Revision 2) Section 4.3.2.2.

AMR Items Not Associated with an AMP

LRA AMR Evaluation 3.6.2.2.2, "Reduced Insulation Resistance due to Presence of Any Salt Deposits and Surface Contamination, and Loss of Material due to Mechanical Wear Caused by Wind Blowing on Transmission Conductors"

Summary of Information in the Application

During the audit, the staff reviewed plant documentation associated with the AMR discussed in LRA Section 3.6.2.2.2 and the following:

- LRA Table 3.6.1, "Summary of Aging Management Evaluations for Electrical Components," Item Number 3.6.1-2 - High-voltage insulators composed of porcelain; malleable iron; aluminum; galvanized steel; cement exposed to air – outdoor

- LRA Table 3.6,1, Item Number 3.6.1-3 - High-voltage insulators composed of porcelain; malleable iron; aluminum; galvanized steel; cement exposed to air – outdoor

Audit Activities

An on-site audit was performed September 10, 2024, to September 12, 2024.
The table below lists documents that were reviewed by the staff and were found relevant to the LRA AMR Evaluation 3.6.2.2.2, "Reduced Insulation Resistance due to Presence of Any Salt Deposits and Surface Contamination, and Loss of Material due to Mechanical Wear Caused by Wind Blowing on Transmission Conductors." The staff will document its review of this information in the SE.

Document	Title	Revision / Date
CL-AMRBD-MEAE	Materials, Environments, and Aging Effects Aging Management Review Basis Document	Rev. 2
ER-AA-700-1003	Use of Operating Experience for License renewal Implementation / Aging Management (Constellation Proprietary)	Rev. 006
WO 01775588	Need Work Order Created for SY DISC 4507 Ohio Brass Replmnt	02/09/20215
WO 01824127	EIN: 0SY4504 Degraded Ohio Brass Insulators on Disconnect	04/29/2015
AR 02386323	Track Ohio Brass Insulators in 345 KV Switchyard	05/24/2017
AR 02390377	Need Work Order created for SY DISC 4509 Ohio Brass Replmnt	10/08/2014
AR 02468347	Degraded manual disconnect 4505 insulator	04/03/2015
AR 02484441	EIN: 0SYS4504 Degraded Ohio Grass Insulators on Disconnect	04/27/2015

The staff made the following observation during walkdowns:

- During the on-site audit, the staff performed a walkdown of the SBO offsite power recovery path from the switchyard to the plant auxiliary transformers. The staff did not observe any adverse or abnormal signs of age-related degradation with in-scope high-voltage insulators.

LRA AMR Evaluation 3.6.2.2.3, "Loss of Material due to Wind-Induced Abrasion, Loss of Conductor Strength due to Corrosion, and Increased Resistance of Connection due to Oxidation or Loss of Pre-load"

Summary of Information in the Application

During the audit, the staff reviewed plant documentation associated with the AMRs discussed in LRA Sections 3.6.2.2.3 and the following:

- LRA Table 3.6.1, "Summary of Aging Management Evaluations for Electrical Components," Item Number 3.6.1-4 - Transmission conductors composed of aluminum; steel exposed to air – outdoor

- LRA Table 3.6,1, Item Number 3.6.1-5 - Transmission connectors composed of aluminum; steel exposed to air – outdoor

- LRA Table 3.6,1, Item Number 3.6.1-6 - Switchyard bus and connections composed of aluminum; copper; bronze; stainless steel; galvanized steel exposed to air – outdoor

- LRA Table 3.6,1, Item Number 3.6.1-7 - Transmission conductors composed of aluminum; steel exposed to air - outdoor

Audit Activities

An on-site audit was performed September 10, 2024, to September 12, 2024.

The table below lists documents that were reviewed by the staff and were found relevant to the LRA AMR Evaluation 3.6.2.2.3, “Loss of Material due to Wind-Induced Abrasion, Loss of Conductor Strength due to Corrosion, and Increased Resistance of Connection due to Oxidation or Loss of Pre-load.” The staff will document its review of this information in the SE.

Document	Title	Revision / Date
CL-AMRBD-MEAE	Materials, Environments, and Aging Effects Aging Management Review Basis Document	Rev.2
ER-AA-700-1003	Use of Operating Experience for License renewal Implementation / Aging Management (Constellation Proprietary)	Rev.006

The staff made the following observation during walkdowns:

- During the on-site audit, the staff performed a walkdown of the SBO offsite power recovery path from the switchyard to the plant auxiliary transformers. The staff did not observe any signs of adverse or abnormal age-related degradation with in-scope Switchyard Bus and Connections, Transmission Conductors, and Transmission Connectors.

LRA Section 3.6.2.3.1 – Fuse Holders

Summary of Information in the Application

During the audit, the staff reviewed plant documentation associated with the following:

- LRA Table 3.6.1, “Summary of Aging Management Evaluations for the Electrical Components,” Item 3.6.1-016 notes that fuse holders (not part of active equipment): metallic clamps composed of Various metals used for electrical connections exposed to air – indoor, uncontrolled have an aging effect/mechanism of increased resistance of connection due to chemical contamination, corrosion, and oxidation (in an air, indoor controlled environment, increased resistance of connection due to chemical contamination, corrosion, and oxidation do not apply); fatigue due to ohmic heating, thermal cycling, electrical transients; however, these aging effects are not applicable to CPS.

- LRA Table 3.6.1, Item 3.6.1-017 notes that fuse holders (not part of active equipment): metallic clamps composed of various metals used for electrical connections exposed to air – indoor, controlled or uncontrolled have an aging effect/mechanism of increased resistance of connection due to fatigue caused by frequent manipulation or vibration;

however, these aging effects are not applicable to CPS.

- LRA Table 3.6.1, Item 3.6.1-021 notes that fuse holders (not part of active equipment): insulation material, metal enclosed bus: external surface of enclosure assemblies composed of insulation material: bakelite; phenolic melamine or ceramic; molded polycarbonate; other, galvanized steel; aluminum, steel exposed to air – indoor, controlled or uncontrolled have no aging effect/mechanism at CPS; and therefore, no Aging Management Program is proposed.

Audit Activities

An on-site audit was performed September 10 to September 12, 2024.

The table below lists documents that were reviewed by the staff and were found relevant to the applicant's aging management evaluation of fuse holders. The staff will document its review of this information in the SE.

Document	Title	Revision / Date
CL-AMRBD-MEAE	Materials, Environments, and Aging Effects Aging Management Review Basis Document	Rev. 2
Electrical Components Grouping	On-site Power System System and Structure Scoping Report	Rev. 0
Electrical Components Grouping	Plant Lightning System System and Structure Scoping Report	Rev. 0
Electrical Components Grouping	Plant Computer System System and Structure Scoping Report	Rev. 0
Electrical Components Grouping	Miscellaneous Electrical System System and Structure Scoping Report	Rev. 0
Picture of 1E22-S301 External	Fuse JBox 1E22-S301 External	Print date 09/12/2024
Picture of 1E22-S301 Internal	Fuse JBox 1E22-S301 Internal	Print date 09/12/2024

During the audit, the staff made the following observation:

- Section 3.6.2.3.1 of the LRA noted that XI.E5, "Fuse Holders," is not applicable to CPS. The LRA also noted that fuse holders (metallic clamps) do not meet the screening criteria of NUREG-1801, Chapter XI.E5, because the metallic clamps are not subject to adverse environmental conditions that could cause an increase in electrical resistance of connection, fatigue from ohmic heating, thermal cycling, or electrical transients, or fatigue from frequent fuse removal/manipulation or vibration. As such, the applicant indicated that fuse holders (metallic clamps) are not subject to AMR. Insulating portions

of fuse holders are evaluated with insulation material for electrical cables and connections.

The staff made the following observation during walkdowns:

- During the on-site audit, the staff performed a walkdown of the plant and observed fuse holders within scope of LR. No signs of moisture intrusion, chemical contamination, oxidation, or corrosion were observed during the walkdown.

LRA Sections 3.2.2.2.3.2, 3.2.2.2.6, 3.3.2.2.3, 3.3.2.2.5, 3.4.2.2.2, and 3.4.2.2.3 - Stainless Steel

Summary of Information in the Application

The LRA addresses FE of cracking due to stress corrosion cracking, and loss of material due to pitting or crevice corrosion, of stainless steel in the Engineered Safety Features, Auxiliary, and Steam and Power Conversion Systems. The LRA sections for these FE discussions are: 3.2.2.2.3.2, 3.2.2.2.6, 3.3.2.2.3, 3.3.2.2.5, 3.4.2.2.2, and 3.4.2.2.3.

Audit Activities

During its audit, the staff interviewed the applicant's staff and reviewed documentation contained in the LRA and provided by the applicant via the ePortal. For the operating experience (OE) review, the applicant made a presentation on the process used to identify and evaluate the pertinent OE. Afterwards, the staff conducted its review of the applicant's methodology and operating experience by reviewing documentation contained in the LRA and ePortal. The staff audited this topic to determine if the information in the LRA is consistent with the FE information in the SRP-LR Report.

The staff will document its review of this information in the SE.

3. Supplements to the LRA

By letters dated November 27, 2024 (ML24332A050), December 20, 2024 (ML24355A050), and January 30, 2025 (ML25030A182), CPS voluntarily submitted Supplements 1, 2 and 3 to the LRA resulting from discussions held during the audit.

4. Audit Questions Provided to CPS

Over the course of the audit, the NRC staff provided audit questions to CPS to facilitate the audit discussions (ML25050A270 and ML25050A269), for the non-proprietary and proprietary versions, respectively.

Subject Area	Meeting Date
Breakout Session: ASME Section III, Class 1 Fatigue Exemptions	9/25/2024
Breakout Session: ASME Section III, Class 2, Class 3, and ANSI B31.1 Allowable Stress Analyses	9/25/2024
Breakout Session: Plant-Specific TLAA - Hydraulic Control Units	9/25/2024
Breakout Session: Plant-Specific TLAA - Fuel Pool Cleanup System, Flow Control Valves	9/25/2024

Subject Area	Meeting Date
Breakout Session: Internal Coatings	9/26/2024
Breakout Session: Selective Leaching	9/30/2024 10/1/2024 10/9/2024 10/18/2024 10/28/2024
Breakout Session: Buried and Underground Piping and Tanks	9/30/2024 10/9/2024 12/6/2024
Breakout Session: Inaccessible Power Cables Not Subject to 10 CFR 50.49 EQ Requirements	10/1/2024
Breakout Session: Water Chemistry	10/3/2024
Breakout Session: Fire Protection	10/7/2024
Breakout Session: Monitoring of Neutron-Absorbing Materials Other Than Boraflex	10/7/2024 10/10/2024 10/21/2024
Breakout Session: BWR Stress Corrosion Cracking	10/9/2024
Breakout Session: Structures Monitoring Program	10/10/2024 10/24/2024
Breakout Session: Plant-Specific TLAA - Reactor Shield Wall Fluence	10/10/2024
Breakout Session: RG 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants	10/11/2024 10/16/2024
Breakout Session: Concrete	10/11/2024 10/16/2024
Breakout Session: Inaccessible Areas	10/11/2024 10/16/2024 1/8/2024
Breakout Session: Settlement	10/11/2024 10/16/2024
Breakout Session: Transient Cycle and Cumulative Usage Projections for 60 Years	10/15/2024
Breakout Session: ASME Section III, Class I and Environmentally Assisted Fatigue Analyses	10/15/2024
Breakout Session: ASME Section III, Class 1 Components	10/15/2024
Breakout Session: Reactor Vessel Internals	10/15/2024 10/17/2024
Breakout Session: Closed Treated Water System	10/17/2024
Breakout Session: Containment Liner Plate, Metal Containments, and Penetrations Fatigue Analysis	10/18/2024
Breakout Session: Fire Water System	10/22/2024 10/28/2024 12/9/2024 12/13/2024
Breakout Session: Bolting Integrity	10/23/2024
Breakout Session: Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems	10/23/2024
Breakout Session: Plant-Specific TLAA - Clinton Power Station Crane Cyclic Loading Analysis	10/23/2024

Subject Area	Meeting Date
Breakout Session: Flow-Accelerated Corrosion	10/23/2024 12/13/2024 1/28/2025
Breakout Session: ASME Section XI, Subsection IWF	10/24/2024
Breakout Session: Lubrite	10/24/2024
Breakout Session: Reactor Pressure Vessel Adjusted Reference Temperature	10/31/2024
Breakout Session: Reactor Pressure Vessel Upper-Shelf Energy Analyses	10/31/2024
Breakout Session: Copper Alloy	11/14/2024
Breakout Session: Closed Treated Water	1/28/2025

5. Applicant Personnel Contacted During Audit

Name	Affiliation
Adam Andriano	Constellation
Alexander Psaros	Constellation
Bashar Jabri	Constellation
Behrooz Khorsandi	Constellation
Blake Torres	Constellation
Brandon De Graaf	Constellation
Casey Muggleston	Constellation
Christopher Pragman	Constellation
Evan Apke	Constellation
Francis McGuire	Constellation
Iba Ello Fletcher	Constellation
Jake Levea	Constellation
James Annett	Constellation
Jennifer Lytle	Constellation
Joseph Vacante	Constellation
Joshua Sarrafian	Constellation
Joy Rexshell	Constellation
Kelsi Eiane	Constellation
Kenneth Leffel	Constellation
Ketan Patel	Constellation
Kieren Kearns	Constellation
Kurt Lindeman	Constellation
Lydia Dworakowski	Constellation
Michael Smith	Constellation
Nicholas Lynch	Constellation
Patrick Lewis	Constellation
Peter Tamburro	Constellation
Peter Weidinger	Constellation
Sarah Clark	Constellation
Sarah Swienton	Constellation

Sarika Malani	Constellation
Scott Kauffman	Constellation
Sharida Ullah	Constellation
Tyler Ziegler	Constellation
William Ford	Constellation
Zachary Schwartz	Constellation
Mark Miller	Enercon
Jeff Hren	GE Verona
Name	Affiliation
Mehrdad Zoroufi	GE Verona
Shawn Kliensmith	GE Verona
Yil Kim	GE Verona
Dan Denis	Structural Integrity

6. Exit Meeting

An exit meeting was held with the applicant on February 11, 2025, to discuss the results of the regulatory audit. The staff is considering the issuance of RAIs and RCIs to support the completion of the staff's LRA review.