

AUDIT SUMMARY REGARDING THE LICENSE RENEWAL APPLICATION FOR THE WOLF CREEK GENERATING STATION

I. Introduction

By letter dated October 4, 2006, Wolf Creek Nuclear Operating Corporation (WCNOC) submitted to the U.S. Nuclear Regulatory Commission (NRC) its application for renewal of Operating License No.NPF-42 for the Wolf Creek Generating Station (WCGS). The applicant requested renewal of the operating license for an additional 20 years beyond the 40-year current license term.

In support of the staff's safety review of the LRA for the WCGS, an NRC project team from the Division of License Renewal (DLR), Engineering Review Branch 1 and 2 conducted three onsite audits at the WCGS site at Burlington, Kansas, during the weeks March 26, May 7, and July 9, 2007. The project team consisted of staff members from the NRC and contractors from Advanced Technologies and Laboratories International, Inc. (ATL). The purpose of the onsite audits was to review the aging management programs (AMPs), aging management reviews (AMRs), and time-limited aging analysis (TLAAs) assigned to the project team to ensure compliance with 10 CFR Part 54.

II. Audit and Review Scope

The project team performed its work in accordance with the requirements of 10 CFR Part 54; the guidance provided in Revision 1 of NUREG-1800, Standard Review Plan for Review of License Renewal Applications for Nuclear Power Plants (SRP-LR); and the guidance provided in Revision 1 of NUREG-1801, Generic Aging Lessons Learned (GALL) Report. Details of how the project team implemented these requirements and guidance are found in "Audit and Review Plan for Plant Aging Management Programs, Aging Management Reviews, and Time-Limited Aging Analyses," Docket No. 50-482, (Agencywide Documents Access and Management System (ADAMS), Accession No. ML070230166).

During the onsite audits, the project team reviewed the following WCGS AMPs, AMRs, and TLAAs to ensure compliance with 10 CFR Part 54.

AMPs Reviewed

AMPs That are Consistent with the GALL Report

- B2.1.9 Open-Cycle Cooling Water System
- B2.1.16 One-Time Inspection
- B2.1.18 Buried Piping and Tanks Inspection
- B2.1.20 External Surfaces Monitoring Program
- B2.1.21 Flux Thimble Tube Inspection
- B2.1.22 Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components
- B2.1.24 Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements
- B2.1.25 Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Used in Instrumentation Circuits
- B2.1.26 Inaccessible Medium Voltage Cables Not Subject to 10 CFR 50.49 Environmental Qualification Requirements

ENCLOSURE

B2.1.30 10 CFR 50, Appendix J

AMPs That Are Consistent with the GALL Report with Exceptions and/or Enhancements

- B2.1.1 ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD
- B2.1.2 Water Chemistry
- B2.1.3 Reactor Head Closure Studs
- B2.1.4 Boric Acid Corrosion
- B2.1.5 Nickel-Alloy Penetration Nozzles Welded To The Upper Reactor Vessel Closure Heads of Pressurized Water Reactors
- B2.1.6 Flow-Accelerated Corrosion
- B2.1.7 Bolting Integrity
- B2.1.8 Steam Generator Tube Integrity
- B2.1.10 Closed-Cycle Cooling Water System
- B2.1.11 Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems
- B2.1.12 Fire Protection
- B2.1.13 Fire Water System
- B2.1.14 Fuel Oil Chemistry
- B2.1.17 Selective Leaching of Materials
- B2.1.19 One-Time Inspection of ASME Code Class 1 Small-Bore Piping
- B2.1.23 Lubricating Oil Analysis
- B2.1.27 ASME Section XI, Subsection IWE
- B2.1.28 ASME Section XI, Subsection IWL
- B2.1.29 ASME Section XI, Subsection IWF
- B2.1.31 Masonry Wall Program
- B2.1.32 Structures Monitoring Program
- B2.1.33 RG 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants
- B2.1.36 Electrical Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements
- B3.1 Metal Fatigue of Reactor Coolant Pressure Boundary
- B3.2 Environmental Qualification (EQ) of Electrical Components

The following special AMPs, including two plant-specific programs were reviewed by DCI staff:

- B2.1.15 Reactor Vessel Surveillance
- B2.1.34 Nickel Alloy Aging Management Program (Plant-Specific)
- B2.1.35 Reactor Coolant System Supplement (Plant-Specific)

AMR Results Reviewed

- 3.1 Reactor Vessel, Internals, and Reactor Coolant System
- 3.2 Engineered Safety Features Systems
- 3.3 Auxiliary Systems
- 3.4 Steam and Power Conversion Systems
- 3.5 Containment, Structures, and Component Supports
- 3.6 Electrical and Instrumentation and Controls

TLAAs Reviewed

- 4.3 Metal Fatigue
- 4.4 Environmental Qualification of Electrical Components
- 4.6 Containment Liner Plate, Metal Containment, and Penetrations Fatigue Analysis
- 4.7.1 Containment Polar Crane, Fuel Building Cask Handling Crane, Spent Fuel Pool Bridge Crane, and Fuel Handling Machine CMAA-70 Load Cycle Limits
- 4.7.2 Absence of a TLAA for Reactor Vessel Underclad Cracking Analyses
- 4.7.3. Absence of a TLAA in a Reactor Coolant Pump Flywheel Fatigue Crack Growth Analysis

In addition to the above, the project team reviewed the UFSAR supplement summary descriptions that were provided in LRA, Appendix A, for the AMPs and TLAAs. The project team verified that the supplements provided a sufficient description of the AMP activities or the TLAA description in accordance with the SRP-LR and required by 10 CFR 54.21(d).

III. Summary

During the onsite audits, WCNOG representatives provided a brief presentation regarding its operating experience, design features, plant programs, bases documents, and analyses pertaining to the LRA review. The project team reviewed the LRA and various bases documents, conducted several break-out meetings and technical interviews with the WCNOG personnel, and conducted a walkdown of key plant areas.

The project team asked 225 questions. These questions and WCNOG's responses including staff's review are documented in Section VI of this audit summary. Thirty-four of the questions resulted in revisions to the LRA. The applicant submitted amended sections of the LRA in the following four letters:

- LRA Amendment 1 (TLAA-related), dated June 1, 2007
- LRA Amendment 2 (TLAA-related), dated August 9, 2007
- LRA Amendment 3 (AMP/AMR-related), dated August 31, 2007
- LRA Amendment 4 (AMP/AMR-related), dated October 11, 2007
- LRA Amendment 5 (AMP/AMR-related), dated November 16, 2007

At the conclusion of the onsite audits, the project team summarized the status of its review to the WCNOG staff and management. The project team indicated that the review was ongoing and any additional information necessary to support the review after the onsite audits would be formally requested via request for additional informations (RAIs).

In TLAA related issues, the staff asked a total of 31 questions, including follow-up questions. All of the questions except three were addressed satisfactorily by the applicant at the conclusion of the onsite audits. The three unresolved questions (TLAA002, 003, and 025) are all related to the stress-based fatigue module of the Fatigue Management Program. The staff's main concern is that the applicant has not provided an appropriate benchmarking nor an adequate justification of the validity of its software (FatiguePro) that it can accurately perform stress-based monitoring. The staff issued RAIs 4.3-1, 4.3-2, and 4.3-3 to address these concerns.

Specifically, in RAI 4.3-1, the staff requested the applicant to provide a clear definition of the 1D stress computed by FatiguePro and demonstrate how using a 1D stress can be considered to be

in compliance with the ASME Code with respect to fatigue computation. In RAI 4.3-2, the staff requested the applicant to demonstrate the validity of its FatiguePro transfer function used in the surge line pipe model stress calculations. In RAI 4.3-3, the staff requested the applicant to demonstrate the validity of using backward projection method for computing CUFs for several NUREG/CR-6260 locations.

In AMP/AMR related issues, all of the questions except three were addressed satisfactorily by the applicant at the conclusion of the onsite audits and subsequent reviews. Three Open Items are briefly discussed below:

- (1) AMP: Inaccessible Medium Voltage Cables Not Subject to 10 CFR 50.49 Environmental Qualification Requirements (OI-3.0.3.1.10-1)

In response to the question AMPA120, the staff found the applicant's response unacceptable. The staff and the applicant have different opinions on the scope of plant's system boundary of the offsite power system for the SBO restoration during extended period of operation.

- (2) AMP: Inaccessible Medium Voltage Cables Not Subject to 10 CFR 50.49 Environmental Qualification Requirements (OI-3.0.3.1.10-2)

The staff asked the applicant (question AMPA114) the corrective actions that have been taken by the applicant to address an operating event that water was found in the man-hole 119 (PIR 1998-1790). This PIR was discussed in the operating experience section of this AMP (B2.1.26 - Inaccessible Medium-Voltage Not Subject to 10 CFR 50.49 Environment Qualification Program). The applicant replied that it has initiated a preventive maintenance (PM) program to inspect applicable manholes containing medium-voltage cables. This inspection includes removal of water, if required, visual inspection for corrosion and degradation of cable tray supports and visual inspection for cable jacket degradation. However, during a regional inspection in September 2007, water was found in the emergency service water (ESW) cable manholes. These cables are within the scope of license renewal. In light of this operating experience, the staff is concerned that cables that were submerged for a period of time may not perform their intended functions during the period of extended operation. The inspection and water removal frequency of at least once every two years as proposed in the applicant's Inaccessible Medium-Voltage Not Subject to 10 CFR 50.49 Environment Qualification Program may not be adequate to detect water accumulation in the manholes.

- (3) AMP: Steam Generator Tube Integrity (OI-3.0.3.2.8)

The project team found that the steam generator inspection program may be using techniques that are not consistent with staff positions. Therefore, the project team finds that this is an open item that may be a current licensing issue. This issue has been referred to DCI for resolution. Based on the project team's input, DCI issued RAIs. The applicant modified this AMP to eliminate most of the exceptions. The resolution of this issue will be reviewed and further evaluated by DCI.

The results of the onsite audits, including resolutions of open items, will be documented in the staff's safety evaluation report related to the WCNOCLRA, currently scheduled on February 1, 2008.

IV. Documents Reviewed

The following is a list of applicant documents reviewed by the project team, including documents prepared by others for the applicant. Inclusion of a document on this list does not imply that the project team reviewed the entire document, but, rather that selected sections or portions of the documents were reviewed as part of the overall effort documented in this audit and review report. In addition, inclusion of a document in this list does not imply NRC acceptance of the document.

Applicant's Aging Management Program	GALL Aging Management Program	WCGS LRA-AMP Basis Document and Other Documents Reviewed
ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B2.1.1)	XI.M1, ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD	<p>License Renewal Program Evaluation Report – ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD, WCGS-AMP-B2.1.1, Revision 1</p> <p>ASME Code Section XI, 2001 Edition with 2002 and 2003 Addenda</p> <p>WCNOC Procedure, AP 16A-003, Revision 10, ASME Section XI Repair/Replacement Program</p> <p>WCNOC Procedure, AP 29A-002, Revision 6 Inservice Inspection Program</p> <p>WCNOC Procedure, STS PE-300, Revision 8 Inservice Inspection Examinations</p> <p>WCRE-16, Revision 0, Inservice Inspection Program Plan, Interval 3</p> <p>WCNOC Procedure, QCP-30-103, Revision 6, Qualification and Certification of Examination Personnel</p> <p>NRC Memorandum from Eugene Imbro to Pao-Tsin Kuo dated September 20, 2005, "Alternate ASME Code Editions and Addenda to those Cited in the GALL Report." ML052640091</p>
Water Chemistry (B2.1.2)	XI.M2, Water Chemistry	<p>License Renewal Program Evaluation Report - Water Chemistry, WCGS-AMP-B2.1.2, Revision 2</p> <p>EPRI TR-105714, Revision 5, Pressurized Water Reactor Primary Water Chemistry Guidelines</p> <p>EPRI TR-1008224, Revision 6, Pressurized Water Reactor Secondary Water Chemistry Guidelines</p> <p>License Renewal Aging Management PIR Operating Experience Report for AMP XI.M2, Water Chemistry, B2.1.2 PIR No. 20020270 PIR No. 20021583 PIR No.20030900</p> <p>Strategic Primary Water Chemistry Plan, Revision 3 Strategic Secondary Water Chemistry Plan, Revision 3</p>

Applicant's Aging Management Program	GALL Aging Management Program	WCGS LRA-AMP Basis Document and Other Documents Reviewed
Reactor Head Closure Studs (B2.1.3)	XI.M3, Reactor Head Closure Studs	<p>License Renewal Program Evaluation Report – Reactor Head Closure Studs, WCGS-AMP-B2.1.3, Revision 1</p> <p>ASME Code Section XI, 2001 Edition with 2002 and 2003 Addenda</p> <p>WCNOC Procedure, AP 16A-003, Revision 10, ASME Section XI Repair/Replacement Program</p> <p>WCNOC Procedure, AP 29A-002, Revision 6, Inservice Inspection Program</p> <p>WCNOC Procedure, FHP 02-009A, Revision 2, Reactor Vessel Stud Removal</p> <p>WCNOC Procedure, FHP 02-009B, Revision 2, Reactor Vessel Stud Installation</p> <p>WCNOC Procedure, FHP 02-009C, Revision 0A, Reactor Vessel Stud and Nut Cleaning</p> <p>PDI Generic Procedure, PDI-UT-5, Revision C, Straight Beam Ultrasonic Examination of Bolts and Studs, March 15, 2001</p> <p>WCNOC Procedure, QCP 20-520, Revision 6, Pressure Test Examination</p> <p>WCNOC Procedure, QCP 20-540, Revision 0, VT-1 Visual Examination</p> <p>Lambert MacGill Thomas NDE Procedure UT-11, Revision 11, Ultrasonic Examinations of Reactor Vessel Flange Stud Hole Threads</p> <p>Lambert MacGill Thomas NDE Procedure UT-97, Revision 0 Ultrasonic Examination of Bolts and Studs</p> <p>Lambert MacGill Thomas NDE Procedure UT-97, Revision 0A, Straight Beam Ultrasonic Examination of Bolts and Studs</p> <p>WCNOC Procedure, WCRE-16, Revision 0, Inservice Inspection Program Plan, Interval 3</p> <p>NRC memorandum from Eugene Imbro to Pao-Tsin Kuo dated September 20, 2005, "Alternate ASME Code Editions and Addenda to those Cited in the Gall Report" ML052640091</p> <p>Certified Material Test Reports for the Original Wolf Creek Reactor Head Studs, Nuts and Washers, prepared by the Timken Company, Steel and Tube Division.</p>

Applicant's Aging Management Program	GALL Aging Management Program	WCGS LRA-AMP Basis Document and Other Documents Reviewed
Boric Acid Corrosion (B2.1.4)	XI.M10, Boric Acid Corrosion	<p>License Renewal Program Evaluation Report – Boric Acid Corrosion, WCGS-AMP-B2.1.4, Revision 2</p> <p>Wolf Creek responses to the referenced NRC generic communications are contained in the letters referenced below. Copies of the wolf Creek letters are available on site for review or in ADAMS.</p> <p>NRC Bulletin 2002-01 “Reactor Pressure Vessel Head Degradation and Reactor Coolant Pressure Boundary Integrity”</p> <ol style="list-style-type: none"> 1. WCNOG Letter ET02-0018 dated April 03, 2002 Response to NRC Bulletin 2002-01, “Reactor Pressure Vessel Head Degradation and Reactor Coolant Pressure Boundary Integrity” 2. WCNOG Letter ET 02-0021 dated May 16, 2002 60 day response to NRC Bulletin 2002-01, “Reactor Pressure Vessel Head Degradation and Reactor Coolant Pressure Boundary Integrity” 3. WCNOG Letter ET 03-0007 dated January 31, 2003 Response to Request for Additional Information for NRC Bulletin 2002-01, “Reactor Pressure Vessel Degradation and Reactor Coolant Pressure Boundary Integrity” <p>NRC EA-03-009 “Issuance of First Revised Order (EA-03-009) Establishing Interim Inspection Requirements for Reactor Pressure Vessel Heads at Pressurized Water Reactors”</p> <ol style="list-style-type: none"> 1. WCNOG Letter WM 04-0001 dated January 22, 2004 60 Day Report for NRC Order #A-03-009, “Issuance of First Revised Order (EA-03-009) Establishing Interim Inspection Requirements for Reactor Pressure Vessel Heads at Pressurized Water Reactors” 2. WCNOG Letter WM 04-0004 dated March 04, 2004 Response to NRC Order, “Issuance of First Revised Order (EA-03-009) Establishing Interim Inspection Requirements for Reactor Pressure Vessel Heads at Pressurized Water Reactors” 3. WCNOG Letter WM 06-0051 dated December 20, 2006 60 Day Report for NRC Order EA-03-009, “Issuance of First Revised Order Establishing Interim Inspection Requirements for Reactor Pressure Vessel Heads at Pressurized Water Reactors” <p>4. Note: Additional letters relative to the Wolf Creek relaxation request are noted in the response to question A057</p>

Applicant's Aging Management Program	GALL Aging Management Program	WCGS LRA-AMP Basis Document and Other Documents Reviewed
Boric Acid Corrosion (B2.1.4) (cont.)	XI.M10, Boric Acid Corrosion	<p>NRC Bulletin 2003-02 "Leakage from Reactor Pressure Vessel Lower Head Penetrations and Reactor Pressure Boundary Integrity"</p> <p>1. WCNOC Letter WM 03-0044 dated September 19, 2003 Response to NRC Bulletin 2003-02, "Leakage from Reactor Pressure Vessel Lower Head Penetrations and Reactor Pressure Boundary Integrity"</p> <p>2. WCNOC Letter WM 04-0002 dated January 22, 2004 60 Day Report to NRC Bulletin 2003-02, "Leakage from Reactor Pressure Vessel Lower Head Penetrations and Reactor Pressure Boundary Integrity"</p> <p>3. NRC Letter 05-00051 dated January 20, 2005</p> <p>Wolf Creek Generating Station – Response to NRC Bulletin 2003-02, "Leakage From Reactor Pressure Vessel Lower Head Penetrations and Reactor Coolant Pressure Boundary Integrity"</p> <p>NRC Bulletin 2004-01 "Inspection of Alloy 82/182/600 Materials Used in the Fabrication of Pressurizer Penetrations and Steam Space Piping Connections at PWRs"</p> <p>1. WCNOC Letter ET 05-0015 dated July 14, 2005 60 Day Report for NRC Bulletin 2004-01, "Inspection of Alloy 82/182/600 Materials Used in the fabrication of Pressurizer Penetrations and Steam Space Piping Connections at PWR's"</p> <p>2. WCNOC Letter WO 04-0039 dated July 27, 2004 60 Day Response to NRC Bulletin 2004-01, "Inspection of Alloy 82/182/600 Materials Used in the Fabrication of Pressurizer Penetrations and Steam Space Piping Connections at PWR's"</p> <p>Changes to the Wolf Creek Boric Acid Control Program as a result of the reference NRC Generic Communications:</p> <p>AP 16F-001 Boric Acid Corrosion Control Program Revision 2 was approved December 18, 2000 – no change Revision 3 was approved May 5, 2005 and was a major revision that included the changes noted below Revision 4 was approved October 14, 2005 (current revision – no change) Revision 3 changes:</p> <p>1. As part of this revision two additional AI's were prepared: - AI 16F-001 Evaluation of Boric Acid Leakage - AI 16F-002 Boric Acid Leakage Management</p> <p>2. Section 6.0 was revised to identify the main elements (8) of the program and on a programmatic level, describe how the elements are to be fulfilled. Revisions also described ties to other processes and procedures which are integral to the ability of the BACC Program to meet the objectives of the program</p>

Applicant's Aging Management Program	GALL Aging Management Program	WCGS LRA-AMP Basis Document and Other Documents Reviewed
Boric Acid Corrosion (B2.1.4)(cont.)	XI.M10, Boric Acid Corrosion	<p>3. Attachment A was added to provide guidance on leakage</p> <p>4 Attachment B was added to clarify/capture frequency of program inspections/examinations (references NRC Bulletin 2002-01 & NRC Order EA-03-009 inspections)</p> <p>STN PE-040D RCS Pressure Boundary Integrity Walkdown Revision 1 was approved July 17, 2001 – No Change Revision 2 was approved May 22, 2003 is the current revision and includes the following changes:</p> <ol style="list-style-type: none"> 1. Added new sections to examine the vessel safe-end nozzles, vessel sides and bottom penetrations. 2. Added Attachment 1 for Reactor Vessel Loop Safe-Ends Inspection Results and Attachment J for Reactor Vessel Sides and Bottom Head Inspection Results. 3. Revised attachment G, Containment – Reactor Cavity Inspection Results to note that any evidence of boron leakage from above vessel may have penetrated the mirror insulation shall require a head bare metal inspection from the potentially affected areas. 4. Attachment K added to identify components/locations containing Alloy 600 materials, which have been shown to be susceptible to PWSCC.
Nickel-Alloy Penetration Nozzles Welded To The Upper Reactor Vessel Closure Heads of Pressurized Water Reactors (B2.1.5)	XI.M11A, Nickel-Alloy Penetration Nozzles Welded To The Upper Reactor Vessel Closure Heads of Pressurized Water Reactors	<p>License Renewal Program Evaluation Report – Nickel-Alloy Penetration Nozzles Welded To The Upper Reactor Vessel Closure Heads of Pressurized Water Reactors, WCGS-AMP-B2.1.5, Revision 1</p> <p>Order Establishing Interim Inspection Requirements for Reactor Pressure Vessel Heads at Pressurized Water Reactors, EA 03-009, February 11, 2003. ML030380470</p> <p>First Revised NRC Order (EA-03-009) Establishing Interim Inspection Requirements for Reactor Pressure Vessel Heads at Pressurized Water Reactors, February 20, 2004. ML040220181</p> <p>WCNOC Procedure, AP 29A-27, Revision 0, Alloy 600 Program Management</p> <p>WCNOC Procedure, STS PE-040E, Revision 0, RPV Head Bare Metal Inspection</p> <p>WCNOC Procedure, STS PE-040H, Revision 0, RPV Head NDE Examination</p> <p>WCNOC Procedure, WCRE-15, Revision 0, Program Plan for Management of Alloy 600 Components</p>

Applicant's Aging Management Program	GALL Aging Management Program	WCGS LRA-AMP Basis Document and Other Documents Reviewed
Flow-Accelerated Corrosion (B2.1.6)	XI.M17, Flow-Accelerated Corrosion	<p>WCNOC Procedure, AP 23H-002, Revision 1, Flow Accelerated Corrosion Program</p> <p>WCNOC Procedure, AI 23H-002, Revision 2, Guidelines for Implementation of the Flow Accelerated Corrosion (FAC) Program</p> <p>WCNOC Procedure, QCP 20-503, Revision 1, Ultrasonic Examination for Component Wall Thinning</p> <p>WCNOC Procedure, QCP 20-517, Revision 1, Radiographic Examination for component Wall Thinning</p> <p>WCNOC Procedure, NSAC-2-2L, Revision 3, Recommendation for an Effective Flow-Accelerated Corrosion Program</p> <p>WCNOC – 126 Revision 0, Summary of Operating Cycle 10 Flow Accelerated Corrosion small bore RT Inspection results</p> <p>WCNOC – 147, Revision 0, Summary of Evaluations of WCGS Pipe Wall Thickness, UT Inspections for RF11</p> <p>WCNOC – 152, Revision 0, Summary of Evaluations of WCGS Pipe Wall Thickness, UT Inspections for RF12</p> <p>WCNOC – 155, Revision 0, Summary of Evaluation of WCGS Pipe Wall Thickness, UT Inspections for RF/CY 13</p> <p>License Renewal Program Evaluation Report - Flow Accelerated Corrosion, WCGS-AMP-B2.1.6, Revision 2</p>
Bolting Integrity (B2.1.7)	XI.M18, Bolting Integrity	<p>License Renewal Program Evaluation Report – Bolting Integrity, WCGS-AMP-B2.1.7, Revision 1</p> <p>PIR No. 19931418</p> <p>PIR No. 19951284</p> <p>PIR No. 19962561</p> <p>PIR No. 19962916</p> <p>PIR No. 19973658</p> <p>PIR No. 19980266</p>
Steam Generator Tube Integrity (B2.1.8)	XI.M19, Steam Generator Tube Integrity	License Renewal Program Evaluation Report – Steam Generator Tube Integrity, WCGS-AMP-B2.1.8, Revision 3

Applicant's Aging Management Program	GALL Aging Management Program	WCGS LRA-AMP Basis Document and Other Documents Reviewed
Open-Cycle Cooling Water System (B2.1.9)	XI.M20, Open-Cycle Cooling Water System	<p>"Service Water System Problems Affecting Safety Related Equipment," Generic Letter 89-13, USNRC, July 18, 1989.</p> <p>"Service Water System Problems Affecting Safety Related Equipment," Generic Letter 89-13, Supplement 1, USNRC, April 4, 1990.</p> <p>NUREG-1801, Vol. 2, Revision 1, Generic Aging Lessons Learned (GALL) Report, September 2005, XI.M20 Open-Cycle Cooling Water System, pp. XI M-72 through XI M-74.</p> <p>NUREG-1800, Rev. 1, Standard Review Plan for Review of License Renewal Applications for Nuclear Power Plants, September 2005.</p> <p>WCNOC Procedure, AP 23L-001, Revision 2, Lake Water Systems Corrosion and Fouling Mitigation Program</p> <p>WCNOC Procedure, AP 23L-002, Revision 1, Heat Exchanger Program</p> <p>WCNOC Procedure, AI 07A-008, Revision 13, Lake Water Chemical Treatment Program</p> <p>WCNOC Procedure, QCP-20-518, Revision 4, Visual Examination of Heat Exchangers and Piping Components</p> <p>WCNOC Procedure, WCRE-13, Revision 2, Lake Water Systems Structural Integrity Program</p> <p>WCNOC Letter ET 90-0023, dated January 30, 1990, Response to Generic Letter 89-13</p> <p>WCNOC Letter ET 94-0012, dated February 18, 1994, Updated Response to Generic Letter 89-13</p> <p>WCNOC Letter ET 99-0042, dated November 17, 1999, Updated Response to Generic Letter 89-13</p> <p>PIR No. 2004-0688</p> <p>PIR No. 2002-0407</p> <p>License Renewal Program Evaluation Report – Open -Cycle Cooling Water System, WCGS-AMP-B2.1.9, Revision 2</p>

Applicant's Aging Management Program	GALL Aging Management Program	WCGS LRA-AMP Basis Document and Other Documents Reviewed
<p>Closed-Cycle Cooling Water System (B2.1.10)</p>	<p>XI.M21, Closed-Cycle Cooling Water System</p>	<p>License Renewal Program Evaluation Report – Closed-Cycle Cooling Water System, WCGS-AMP-B2.1.10, Revision 2</p> <p>EPRI TR-1007820, Revision 1, Closed-Cycle Cooling Water Chemistry Guidelines, Revision 1 to TR-107396</p> <p>Strategic Closed-Cycle Cooling Water Chemistry Plan, Revision 0</p> <p>Procedures STS MT-077, Revision 1, CCW Return to CCW Pumps Check Valve Inspection</p> <p>License Renewal Aging Management PIR Operating Experience Report for AMP XI.M21 Closed-Cycle Cooling Water System, B2.1.10 PIR No. 20030900 PIR No. 20020804</p>
<p>Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems (B2.1.11)</p>	<p>XI.M23, Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems</p>	<p>NUREG-1801, Vol. 2, Revision 1, Generic Aging Lessons Learned (GALL) Report, September 2005, pp. XI M-99 through XI M-101</p> <p>NUREG-1800, Revision 1, Standard Review plan for Review of License Renewal Applications for Nuclear Power Plants, September 2005</p> <p>License Renewal Program Evaluation Report – Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems, WCGS-AMP-B2.1.11, Revision 3</p> <p>MGM MOOP-012, Revision 5, Crane/Hoist Inspections</p> <p>MGM MOOP-05, Revision 11, Routine Crane and Hoist Inspections – Mechanical</p> <p>MPM C151Q-01, Revision 10, Containment Equipment Hatch Maintenance and Operation</p> <p>MPM M062-01, Revision 6, Cask handling Crane Mechanical Inspection and Lubrication</p> <p>MPM M063-01, Revision 8, Polar Crane Mechanical Inspection</p> <p>MPM M067-01, Revision 12, Spent Fuel Pool Crane Lubrication and Mechanical Inspection</p> <p>MPM M716-04, Revision 11, Manipulator Crane Inspection/Lubrication</p> <p>PM 29101, Internals Lift Rig Inspection, WO# 02-241215-000, November 4, 2005</p>

Applicant's Aging Management Program	GALL Aging Management Program	WCGS LRA-AMP Basis Document and Other Documents Reviewed
Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems (B2.1.11) (cont.)	XI.M23, Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems	<p>PM 35992, Lift Rig Inspection and Cleaning, WO# 02-241396-000, November 14, 2005</p> <p>MCNOC Procedure, AP 28A-001, Revision 26, Performance Improvement Request</p> <p>MCNOC Procedure, AP, 28-007, Revision 3A, Nonconformance Control</p> <p>MCNOC Procedure, AP, 28-011, Revision 1, Resolving Deficiencies Impacting SSCs</p>
Fire Protection (B2.1.12)	XI.M26, Fire Protection	<p>License Renewal Program Evaluation Report – Fire Protection, WCGS-AMP-B2.1.10, Revision 2</p> <p>WCNOC procedure, AP 10-100, Revision 10A, Fire Protection Program</p> <p>STN FP-225, Revision 4, Fire Barrier Inspection</p> <p>STN FP-400 series, Revision various, Halon System testing procedures</p> <p>STN FP-440, Revision 6, Fire Door Visual Inspection</p> <p>STN FP-452, Revision 4, Fire Barrier Penetration Seals Inspection for AMP XI.M26, Fire Protection, B2.1.12 PIR No. 20030900</p>
Fire Water System (B2.1.13)	XI.M27, Fire Water System	<p>License Renewal Program Evaluation Report – Fire Water System, WCGS-AMP-B2.1.13, Revision 1</p> <p>WCNOC Procedure, AP 10-100, Revision 10A, Fire Protection Program</p> <p>STN FP-209, Revision 12, Fire Pump performance and Sequential Start Test</p> <p>License Renewal Aging Management PIR Operating Experience Report for AMP XI.M27, Fire Water, B2.1.13 PIR No. 20011829</p> <p>USAR Table 9.5E-1 (Sheet 4), section III.E, Hydrostatic Hose Tests</p>

Applicant's Aging Management Program	GALL Aging Management Program	WCGS LRA-AMP Basis Document and Other Documents Reviewed
Fuel Oil Chemistry (B2.1.14)	XI.M30, Fuel Oil Chemistry	<p>NUREG-1801, Vol. 2, Revision 1, Generic Aging Lessons Learned (GALL) Report, September 2005, pp. XI M-99 through XI M-101</p> <p>NUREG-1800, Revision 1, Standard Review Plan for Review of License Renewal Applications for Nuclear Power Plants, September 2005</p> <p>Standard Test Method for Water and Sediment in Fuel Oils by the Centrifuge Method (Laboratory Procedure), ASTM D 1796</p> <p>Standard Test Method for Particulate Contaminant in Aviation fuel by Line Sampling, ASTM D 2276</p> <p>Standard Test Method for Particulate Contamination in Middle Distillate Fuels by Laboratory Filtration, ASTM D 6217</p> <p>Standard Specification for Diesel Fuel Oils, ASTM D 975</p> <p>Standard Practice for Manual Sampling of Petroleum and Petroleum Products, ASTM D 4057</p> <p>Standard Method for Water and Sediment in Middle Distillate Fuels by Centrifuge, ASTM D 2709</p> <p>Standard Test Method for Particulate Contamination in Middle Distillate Fuels by Laboratory Filtration, ASTM D 6217</p> <p>Standard Technical Specifications, Westinghouse Plants, Specifications, NUREG-1431, Vol. 1, Revision 3.0, June 2004</p> <p>Standard Technical Specifications, Westinghouse Plants, Bases, NUREG-1431, Vol. 2, Revision 3.0, June 2004</p> <p>Standby Diesel Fuel Oil Storage Tanks Drain and Clean, STN MT-002, Revision 4, May 6, 2005, Wolf Creek Nuclear Operating Corporation</p> <p>Chemistry Surveillance Program, AP 02-002, Revision 25, March 30, 2006, Section 6.40, Diesel Fuel Oil, Wolf Creek Nuclear Operating Corporation</p> <p>Chemistry Specification manual, AP 02-003, Revision 27, May 6, 2005, Section 6.43 System - Diesel Fuel Oil, Wolf Creek Nuclear Operating Corporation.</p> <p>PIR 20021679, PIR 20022901, PIR 20030177</p> <p>Missing Coating on TJE01B, CCP 10153 Revision 1, June 13, 2002</p> <p>WO No. 02-235307-000</p>

Applicant's Aging Management Program	GALL Aging Management Program	WCGS LRA-AMP Basis Document and Other Documents Reviewed
Fuel Oil Chemistry (B2.1.14) (cont.)	XI.M30, Fuel Oil Chemistry	<p>Wolf Creek Updated Safety Analysis Report (USAR), Revision 19, March 1, 2006, Sections 9.5.4.2, System Description, Section 9.5.4.3, Safety Evaluation, and Table 9.5.4-3, Comparison of the Design to Regulatory Positions of Regulatory Guide 1.137, Revision 0 Dated January 1978, "Fuel-Oil Systems for Standby Diesel Generators"</p> <p>CHS SH-D01, "Sampling Diesel Fuel", Revision 6</p> <p>CHA DF-102, "Determination of Water and Sediment in Oil (Centrifuge Method)", Revision 4 CHA DF-104, "Diesel Fuel Particulate Analysis", Revision 6</p> <p>STS CH-015, "Emergency Diesel New Fuel", Revision 21</p> <p>STN FP-600, "Fire Pump Diesel Fuel Storage Tank", Revision 8</p> <p>STN FP-211, "Diesel Fire Pump 1FP01PB Monthly Operation and Fuel Level Check", Revision 11</p> <p>CHSF SH-D01-04, "Sampling of the Fire Pump Diesel Storage Tank", Revision 0</p> <p>License Renewal Program Evaluation Report – Fuel Oil Chemistry, WCGS-AMP-B2.1.14, Revision 2</p>
Reactor Vessel Surveillance (B2.1.15)	XI.M31, Reactor Vessel Surveillance	
One-Time Inspection (B2.1.16)	XI.M32, One Time Inspection	License Renewal Program Evaluation Report – One-Time Inspection, WCGS-AMP–B2.1.16, Revision 1

Applicant's Aging Management Program	GALL Aging Management Program	WCGS LRA-AMP Basis Document and Other Documents Reviewed
Selective Leaching of Materials (B2.1.17)	XI.M33, Selective Leaching of Materials	<p>NUREG-1901, Vol.2, Revision 1, Generic Aging Lessons Learned (GALL) Report, September 2005, pp.XI M-123 through XI M-124</p> <p>NUREG-1800, Revision 1, Standard Review Plan for Review of License Renewal Applications for Nuclear Power Plants, September 2005</p> <p>License Renewal Program Evaluation Report - Selective Leaching of Materials, WCGS-AMP-B2.1.27, Revision 1</p> <p>Draft M33 Selective Leaching Inspection Program document "One-Time Inspection For Selective Leaching Degradation of Components" (Initial Draft) NEW PROCEDURE Inspection for Selective Leaching Degradation of Components</p> <p>TR-1003056 Non-Class 1 Mechanical Implementation Guideline and Mechanical Tools Revision 3, EPRI 2001</p> <p>PIR 2002-0048</p> <p>WCGS 02-00494, Evaluation of Emergency Diesel Generator Heat Exchanger Tubing from Wolf Creek Generating Station, 51-5019066-00, Final Report, Framatome ANP, June 2002</p> <p>WCGS 02-00672, Supplemental Evaluation of Emergency Diesel Generator Heat Exchanger Tubing from Wolf Creek Generating Station, 51-5021465-00, Final Report, Framatome ANP, November 2002</p>
Buried Piping and Tanks Inspection (B2.1.18)	XI.M34, Buried Piping and Tanks Inspection	License Renewal Program Evaluation Report - Buried Piping and Tanks Inspection, WCGW-AMP-B2.1.18, Revision 2
One-Time Inspection of ASME Code Class 1 Small-Bore Piping (B2.1.19)	XI.M35, One-Time Inspection of ASME Code Class 1 Small-Bore Piping	License Renewal Program Evaluation Report - One-Time Inspection of ASME Code Class 1 Small-Bore Piping, WCGS-AMP-B2.1.19, Revision 1
External Surfaces Monitoring Program (B2.1.20)	XI.M36, External Surfaces Monitoring Program	<p>WCNOC Procedure, AP 23-006, Revision 16, System Engineering Program</p> <p>WCNOC Procedure, APF 23-006-02, Revision 1, System Walkdown</p> <p>License Renewal Program Evaluation Report - External Surfaces Monitoring Program, WCGS-AMP-B2.1.20, Revision 1</p>

Applicant's Aging Management Program	GALL Aging Management Program	WCGS LRA-AMP Basis Document and Other Documents Reviewed
Flux Thimble Tube Inspections (B2.1.21)	XI.M37, Flux Thimble Tube Inspections	<p>License Renewal Program Evaluation Report – Flux Thimble Tube Inspection, WCGS-AMP-B2.1.21, Revision 2</p> <p>WCNOC Procedure, RXE 03-006, Revision 0, Incore Flux Thimble Wear Assessment,</p> <p>WCNOC Letter WM-89-0015 to the NRC, dated January 18, 1989, “Response to NRC Bulletin 88-09”</p> <p>WCGS Engineering Evaluation Request EER 88-SR-01, Revision 0, 07/20/1988; and associated Engineering Disposition TSA No. 20040-007, Revision 0, September 30, 1988</p> <p>WCNOC Procedure, QCP-20-514, Revision 5, Eddy Current Testing</p> <p>WCNPC Procedure, RXE 03-006, Revision 0, Incore Flux Thimble Wear Assessment</p> <p>WCAP-12866, “Bottom Mounted Instrumentation Flux Thimble Wear”</p>
Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B2.1.22)	XI.M38, Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components	License Renewal Program Evaluation Report – Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components, WCGS-AMP-B2.1.22, Revision 0
Lubricating Oil Analysis (B2.1.23)	XI.M39, Lubricating Oil Analysis	<p>NUREG-1801, Vol. 2, Revision 1, Generic Aging Lessons Learned (GALL) Report, September 2005, pp. XI M-123 Through XI M-124</p> <p>NUREG-1800, Revision 1, Standard Review Plan for Review of License Renewal Applications for Nuclear Power Plants, September 2005</p> <p>I-ENG-004, Revision 2, Lubricating Oil Analysis, May 30, 2002</p> <p>ASTM D2896, 2005, Standard Test Method for Base Number of Petroleum</p> <p>License Renewal Program Evaluation Report – Lubricating Oil Analysis, WCGS-AMP-B2.1.23, Revision 1</p>
Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements (B2.1.24)	XI.E1, Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements	<p>License Renewal Program Evaluation Report – Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements, WCGS-AMP-B2.1.24, Revision 0</p> <p>MPE CI-002, “Inspection of Cables and Connections Not Subject to EQ Requirements”, Revision Draft</p>

Applicant's Aging Management Program	GALL Aging Management Program	WCGS LRA-AMP Basis Document and Other Documents Reviewed
Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Used in Instrumentation Circuits (B2.1.25)	XI.E2, Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Used in Instrumentation Circuits	<p>License Renewal Program Evaluation Report – Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Used in Instrumentation Circuits, WCGS-AMP-B2.1.25, Revision 0</p> <p>STS IC-431, “Channel Calibration NIS Source Range” – 31, Revision 14</p> <p>STS IC-432, “Channel Calibration NIS Source Range” – 32, Revision 14</p> <p>STS IC-440, “Channel Calibration NIS Intermediate Range and Power Range Detector High Voltage Plateaus”, Revision 3</p>
Inaccessible Medium Voltage Cables Not Subject to 10 CFR 50.49 Environmental Qualification Requirements (B2.1.26)	XI.E3, Inaccessible Medium Voltage Cables Not Subject to 10 CFR 50.49 Environmental Qualification Requirements	<p>License Renewal Program Evaluation Report – Inaccessible Medium Voltage Cables Not Subject to 10 CFR 50.49 Environmental Qualification Requirements, WCGS-AMP-B2.1.26, Revision 1</p> <p>MPE CI-003, “Testing of Inaccessible Medium Voltage Cables Not Subject to EQ Requirements”, Draft</p> <p>MPE CI-004, “Inspection of Cable Manholes Containing Non EQ Inaccessible Medium Voltage Cables”, Draft</p> <p>License Renewal Aging Management Industry Operating Experience Report for AMP XI.E3, “Inaccessible Medium Voltage Cables Not Subject to 10 CFR 50.49 EQ Requirements”, B2.1.26</p>
Electrical Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements (B2.1.36)	XI.E6, Electrical Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements	<p>License Renewal Program Evaluation Report – Electrical Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements, WCGS-AMP-B2.1.36, Revision 0</p> <p>Operating Experience Summary Report for XI.E6, “Electrical Cable connections Not Subject to 10 CFR 50.49</p> <p>License Renewal Aging Management Work Order Operating Experience Report for AMP XI.E6, “Electrical Cable connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements”, B2.1.36</p> <p>4.1 I-ENG-005, ‘Infrared Thermography’, Revision 1</p>
ASME Section XI, Subsection IWE (B2.1.27)	XI.S1, ASME Section XI, Subsection IWE	<p>WCNOC Procedure, AP 29A-005, Revision 1A, Containment Inservice Inspection Program DC50 January 5, 2005</p> <p>WCRE-11, Revision 2, Containment Inservice Inspection Program Plan DC31 June 1, 2004</p> <p>WCNOC Procedure, QCP 20-519, Revision 6, section XI Visual Examination DC12 April 21, 2005</p> <p>License Renewal Program Evaluation Report – ASME Section XI, Subsection IWE, WCGS-AMP-B2.1.27, Revision 0</p>

Applicant's Aging Management Program	GALL Aging Management Program	WCGS LRA-AMP Basis Document and Other Documents Reviewed
ASME Section XI, Subsection IWL (B2.1.28)	XI.S2, ASME Section XI, Subsection IWL	<p>WCNOC Procedure, AP 29A-005, Revision 1A, Containment Inservice Inspection Program DC50 January 5, 2005</p> <p>WCNOC Procedure, C-158(Q), Revision 10, Technical Specification for Containment Tendon Surveillance DC4 June 14, 2005</p> <p>WCNOC Procedure, QCP 20-519, Revision 6, Section XI Visual Examination DC12 April 21, 2005</p> <p>WCNOC Procedure, STS-MT-044, Revision 7A, Containment Tendon Inspection DC38 June 14, 2005</p> <p>WCRE-11, Revision 2, Containment Inservice Inspection Program Plan DC31 June 1, 2004</p> <p>License Renewal Program Evaluation Report – ASME Section XI, Subsection IWL, WCGS-AMP-B2.1.28, Revision 0</p>
ASME Section XI, Subsection IWF (B2.1.29)	XI.S3, ASME Section XI, Subsection IWF	<p>License Renewal Program Evaluation Report – ASME Section XI, Subsection IWF, WCGS-AMP-B2.1.29, Revision 1</p> <p>WCNOC Procedure, AP 29A-002, Revision 6, Inservice Inspection Program</p> <p>WCNOC Procedure, QCP-30-103, Revision 6, Qualification and Certification of Examination Personnel</p> <p>WCNOC Procedure, QCP 20-541, Revision 0, VT-3 Visual Examination</p> <p>WCGS Inservice Inspection Program Plan, Interval 3, WCRE-16, Revision 0</p>
10 CFR 50, Appendix J (B2.1.30)	XI.S4, 10 CFR 50, Appendix J	<p>License Renewal Program Evaluation Report – CFR Part 50, Appendix J, WCGS-AMP-B2.1.30, Revision 2</p> <p>Program Plan for containment Leakage Measurement, AP 29E-001, Revision 8</p> <p>Containment Integrated Leak Rate Test, STS PE-018, Revision 7</p> <p>Containment Structure Surface Inspection, STS PE-265, Revision 2</p> <p>Industry Guideline for Performance-Based Option of 10 CFR 5, Appendix J, NEI 94-01, Revision 0</p> <p>USAR 6.2.6</p>

Applicant's Aging Management Program	GALL Aging Management Program	WCGS LRA-AMP Basis Document and Other Documents Reviewed
Masonry Wall Program (B2.1.31)	XI.S5, Masonry Wall Program	<p>WCNOC Procedure, AI 23M-007, Revision 3, Structures Monitoring Program DC38 September 6, 2006</p> <p>WCNOC Procedure, AP 23M-001, Revision 5, WCGS Maintenance Rule Program DC12 August 19, 2005</p> <p>WCNOC Procedure, EDI 23M-020, Revision 2, Engineering Desktop Instruction Determining the Safety Significance of Structures, Systems and Components Within the Scope of the Maintenance Rule March 21, 2002</p> <p>WCNOC STN FP-225, Revision 3, Fire Barrier Inspection DC38 April 20, 2006</p> <p>License Renewal Program Evaluation Report – Masonry Wall Program, WCGS-AMP-B2.1.31, Revision 1</p>
Structures Monitoring Program (B2.1.32)	XI.S6, Structures Monitoring Program	<p>WCNOC Procedure, AI 23M-007, Revision 3, Structures Monitoring Program DC38 September 6, 2006</p> <p>WCNOC Procedure, AP 23M-001, Revision 5, WCGS Maintenance Rule Program DC12 August 19, 2005</p> <p>License Renewal Program Evaluation Report – Structures Monitoring Program, WCGS-AMP-B2.1.32, Revision 1</p>
RG 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants (B2.1.33)	XI.S7, RG 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants	<p>WCNOC Procedure, AP 29D-001, UHS Monitoring Program DC50 May 21, 2004</p> <p>WCNOC Procedure, AP 29-005, Examination of Safety-Related Concrete Water Control Structures DC12 August 5, 2004</p> <p>WCGS Technical Specification C-404(Q), Revision 5, Periodic Surveillance of Safety Related Water-Control Structures and Reservoir DC2 August 21, 2003</p> <p>License Renewal Program Evaluation Report - Regulatory Guide 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants, WCGS-AMP-B2.1.33, Revision</p>
Metal Fatigue of Reactor Coolant Pressure Boundary (B3.1)	X.M1, Metal Fatigue of Reactor Coolant Pressure Boundary	<p>License Renewal Program Evaluation Report – Metal Fatigue of Reactor Coolant Pressure Boundary, WCGS-AMP-B3.1, Revision 0</p>
Environmental Qualification (EQ) of Electrical Components (B3.2)	X.E1, Environmental Qualification (EQ) of Electrical Components	<p>WCGS-AMP-B3.2, "Environmental Qualification (EQ) of Electrical Components", Revision 0</p> <p>AP 05G-01, "Equipment Qualification", Revision 0</p> <p>AP 05G-002, "Equipment Qualification Review of Electrical Equipment to 10 CFR 50.49", Revision 2</p> <p>AP 05G-004, "Equipment Qualification Summary Document", Revision 2</p> <p>License Renewal Industry Operating Experience Report for AMP X.E1, "Environmental Qualification (EQ) of Electrical Components", B3.2</p>

Applicant's Aging Management Program	GALL Aging Management Program	WCGS LRA-AMP Basis Document and Other Documents Reviewed
Concrete Containment Tendon Prestress (B3.3)	X.S1, Concrete Containment Tendon Prestress	

Applicant's Aging Management Report Section	LRA-AMR Basis Document and Other Documents Reviewed
Section 3.1 – Reactor Coolant Systems	<p>License Renewal Aging Evaluation Report, WCGS-AER-BBVI-Rev. 1-Reactor Vessel & Internals</p> <p>License Renewal Aging Evaluation Report, WCGS-AER-BB-Rev. 2-Reactor Coolant System</p> <p>License Renewal Aging Evaluation Report, WCGS-AER-SGR-Rev. 3-Steam Generators Super System</p> <p>Design Specification for Nuclear Reactor Internals-Wolf Creek Drawing M-703-00207, Revision W02.</p> <p>Certified Material Test Reports from Sandusky Foundry & Machine Company for Class 1 CASS Piping at WCGS.</p> <p>Certified Material Test Reports from Westinghouse Corporation for the Class 1 CASS Pipe Fittings at WCGS.</p>
Section 3.2 - Engineered Safety Features	<p>License Renewal Aging Evaluation Report, WCGS-AER- SJ-Rev. 1-Nuclear Sampling System</p> <p>License Renewal Aging Evaluation Report, WCGS-AER-EN-Rev. 2-Containment Spray System</p> <p>Metals Hand book, Ninth Edition, Volume 13, Corrosion, 1987</p> <p>Specification M-105B, ASME Section III, Shop Fabricated Tanks, APPENDIX-F, M-1058 Sheet F-1 of 1, Revision 8, Containment Spray Additive Tank Data Sheet.</p> <p>Safety Evaluation Report Related to the License Renewal of The Virgil C. Summer Nuclear Station, NUREG-1787, March 2004.</p> <p>The Hendrix Group Materials and Corrosion Engineers, Corrosion in Caustic solutions.</p> <p>Piping Class Summary, System EN, MS-01 Revision 33, Sheets 1 through 6.</p> <p>License Renewal Aging Evaluation Report, WCGS-AER-GP-Rev. 0-Containment Integrated Leak Rate Test System</p> <p>License Renewal Aging Evaluation Report, WCGS-AER-HD-Rev. 1-Decontamination System</p> <p>License Renewal Aging Evaluation Report, WCGS-AER-HB-Rev. 1-Liquid Radwaste System</p> <p>License Renewal Aging Evaluation Report, WCGS-AER-BL-Rev. 1-Reactor Makeup Water System</p> <p>License Renewal Aging Evaluation Report, WCGS-AER-GT-Rev. 1-Containment Purge HVAC System</p> <p>License Renewal Aging Evaluation Report, WCGS-AER-KB-Rev. 0-Breathing Air System</p> <p>License Renewal Aging Evaluation Report, WCGS-AER-GS-Rev. 1-Containment Hydrogen Control System</p> <p>License Renewal Aging Evaluation Report, WCGS-AER-EM-Rev. 2-High Pressure Coolant Injection System</p> <p>License Renewal Aging Evaluation Report, WCGS-AER-EJ-Rev. 2-Residual Heat Removal</p>

Applicant's Aging Management Report Section	LRA-AMR Basis Document and Other Documents Reviewed
Section 3.3 - Auxiliary Systems	License Renewal Aging Evaluation Report, WCGS-AER-KE-Rev. 1-Fuel Handling Fuel Storage and Reactor Vessel Service License Renewal Aging Evaluation Report, WCGS-AER-EC-Rev. 1 Fuel Pool Cooling and Cleanup System License Renewal Aging Evaluation Report, WCGS-AER-EF-Rev. 1 Essential Service Water License Renewal Aging Evaluation Report, WCGS-AER-EG-Rev. 1 -Component Cooling Water System License Renewal Aging Evaluation Report, WCGS-AER-GN-Rev. 1- Containment Cooling System License Renewal Aging Evaluation Report, WCGS-AER-KA-Rev. 1- Compressed Air System License Renewal Aging Evaluation Report, WCGS-AER-BG-Rev. 1 -Chemical & Volume Control System License Renewal Aging Evaluation Report, WCGS-AER-GL-Rev. 1- Auxiliary Building HVAC System License Renewal Aging Evaluation Report, WCGS-AER-GK-Rev. 1-Control Building HVAC System License Renewal Aging Evaluation Report, WCGS-AER-GG-Rev. 1- Fuel Building HVAC System License Renewal Aging Evaluation Report, WCGS-AER-GD-Rev. 1-Essential Service Water Pump house Bldg HVAC System License Renewal Aging Evaluation Report, WCGS-AER-GF-Rev. 1-Miscellaneous Buildings HVAC System (incl. AFW Pump Room) License Renewal Aging Evaluation Report, WCGS-AER-GM-Rev. 1-Diesel Generator Building HVAC System License Renewal Aging Evaluation Report, WCGS-AER-KC-Rev. 2-Fire Protection System (B) License Renewal Aging Evaluation Report, WCGS-AER-JE-Rev. 1- Emergency Diesel Engine Fuel Oil Storage and Transfer System License Renewal Aging Evaluation Report, WCGS-AER-KJ-Rev. 2-Standby Diesel Engine System

Applicant's Aging Management Report Section	LRA-AMR Basis Document and Other Documents Reviewed
Section 3.3 - Auxiliary Systems (cont.)	<p>License Renewal Aging Evaluation Report, WCGS-AER-EA-Rev. 0 -Service Water System</p> <p>License Renewal Aging Evaluation Report, WCGS-AER-GA-Rev. 0-Plant Heating System</p> <p>License Renewal Aging Evaluation Report, WCGS-AER-GB-Rev. 0-Central Chilled Water System</p> <p>License Renewal Aging Evaluation Report, WCGS-AER-HA-Rev. 1- Gaseous Radwaste System</p> <p>License Renewal Aging Evaluation Report, WCGS-AER-HE-Rev. 1- Boron Recycle System</p> <p>License Renewal Aging Evaluation Report, WCGS-AER-HF-Rev. 0-Secondary Liquid Waste System</p> <p>License Renewal Aging Evaluation Report, WCGS-AER-KD-Rev. 0-Domestic Water System</p> <p>License Renewal Aging Evaluation Report, WCGS-AER-KT-Rev. 0-ESWS Chemical Addition System</p> <p>License Renewal Aging Evaluation Report, WCGS-AER-LC-Rev. 1-Yard Drainage</p> <p>License Renewal Aging Evaluation Report, WCGS-AER-LD-Rev 1-Chemical and Detergent Waste System</p> <p>License Renewal Aging Evaluation Report, WCGS-AER-LF-Rev. 1-Floor & Equipment Drains System</p> <p>License Renewal Aging Evaluation Report, WCGS-AER-LE-Rev. 1-Oily Waste System</p> <p>License Renewal Aging Evaluation Report, WCGS-AER-KF-Rev. 1-Cranes Hoists & Elevators System</p> <p>License Renewal Aging Evaluation Report, WCGS-AER-GE-Rev. 1-Turbine Bldg. HVAC Air Removal</p> <p>License Renewal Aging Evaluation Report, WCGS-AER-AN-Rev. 1- Demineralized Water Makeup Storage & Transfer System</p>
Section 3.4 - Steam and Power Conversion System	<p>License Renewal Aging Evaluation Report, WCGS-AER-AC-Rev. 2-Main Turbine System</p> <p>Piping & Instrumentation Diagram- Main Turbine LC-WCGS-AC-M-12AC01, Rev. 18</p> <p>License Renewal Aging Evaluation Report, WCGS-AER-AB-Rev. 2-Main Steam System</p> <p>Piping & Instrumentation Diagram-Main Steam System, LR-WCGS-AB-M-12AB02, Rev. 08</p> <p>Piping & Instrumentation Diagram-Main Steam System, LR-WCGS-AB-M-12AB01, Rev. 09</p> <p>Piping & Instrumentation Diagram- Auxiliary Steam System, LR-WCGS-AB-M-12FB02, Rev. 12</p> <p>Piping & Instrumentation Diagram- Auxiliary Steam System, LR-WCGS-AB-M-12FB01, Rev. 14</p> <p>Piping & Instrumentation Diagram- Main Steam System, LR-WCGS-AB-M-12AB03, Rev. 16</p> <p>Wolf Creek License Renewal Position Paper No. TR-10, Rev. 0-Thermal Insulation</p>

Applicant's Aging Management Report Section	LRA-AMR Basis Document and Other Documents Reviewed
Section 3.4 – Steam and Power Conversion System (cont.)	<p>License Renewal Aging Evaluation Report, WCGS-AER-AE-Rev. 2-Feedwater System Piping & Instrumentation Diagram- Feedwater System, LR-WCGS-AE-M-12AE01, Rev. 28</p> <p>Piping & Instrumentation Diagram- Feedwater System, LR-WCGS-AE-M-12AE02, Rev. 06</p> <p>Piping & Instrumentation Diagram- Feedwater Chemical Addition System, LR-WCGS-AE-M-12AQ02, Rev. 03</p> <p>License Renewal Aging Evaluation Report, WCGS-AER-AD-Rev. 2-Condensate System</p> <p>Piping & Instrumentation Diagram- Condensate System, LR-WCGS-AD-M-12AD01, Rev. 03</p> <p>Piping & Instrumentation Diagram- Condensate System, LR-WCGS-AD-M-12AD06, Rev. 08</p> <p>Piping & Instrumentation Diagram- Condensate Storage & Transfer System, LR-WCGS-AD-M-12AP01, Rev. 06</p> <p>License Renewal Aging Evaluation Report, WCGS-AER-BM-Rev. 2-Steam Generator Blowdown System</p> <p>Piping & Instrumentation Diagram- Steam Generator Blowdown System, LR-WCGS-BM-M-12BM01 Rev. 13</p> <p>Piping & Instrumentation Diagram- Steam Generator Blowdown System, LR-WCGS-BM-M-12BM02, Rev. 08</p> <p>Piping & Instrumentation Diagram -Steam Generator Blowdown System, LR-WCGS-BM-M-12BM03, Rev. 03</p> <p>License Renewal Aging Evaluation Report, WCGS-AER-AL-Rev 2- Auxiliary Feedwater System</p> <p>Piping & Instrumentation Diagram- Auxiliary Feedwater System, LR-WCGS-AL-M-12AL01, Rev. 09</p>

Applicant's Aging Management Report Section	LRA-AMR Basis Document and Other Documents Reviewed
Section 3.5 – Structures and Component Supports	License Renewal Aging Evaluation Report, WCGS-AER-Z002-Rev. 1-Reactor Building License Renewal Aging Evaluation Report, WCGS-AER-Z003-Rev. 1-Control Building License Renewal Aging Evaluation Report, WCGS-AER-Z005-Rev. 1-Diesel Generator Building License Renewal Aging Evaluation Report, WCGS-AER-Z004-Rev. 1-Turbine Building License Renewal Aging Evaluation Report, WCGS-AER-Z001-Rev. 1-Auxiliary Building License Renewal Aging Evaluation Report, WCGS-AER-Z007-Rev. 1-Radwaste Building License Renewal Aging Evaluation Report, WCGS-AER-Z055-Rev. 0-Emergency Fuel Oil Tank Access Vaults License Renewal Aging Evaluation Report, WCGS-AER-Z065B-Rev. 1-ESW Electrical Duet Banks and Manways License Renewal Aging Evaluation Report, WCGS-AER-Z010-Rev. 1-Communications Corridor License Renewal Aging Evaluation Report, WCGS-AER-Z100C-Rev. 1-Transmission Towers License Renewal Aging Evaluation Report, WCGS-AER-Z102-Rev. 1- ESWS Access Vaults License Renewal Aging Evaluation Report, WCGS-AER-Z006-Rev. 1-Fuel Building License Renewal Aging Evaluation Report, WCGS-AER-Z018-Rev. 1-ESW Pumphouse Building License Renewal Aging Evaluation Report, WCGS-AER-Z019-Rev. 1-Circulating Water Screen House License Renewal Aging Evaluation Report, WCGS-AER-Z065-Rev. 0-Ultimae Heat Sink License Renewal Aging Evaluation Report, WCGS-AER-Z065A-Rev. 1-Essential Service Water Discharge Structure License Renewal Aging Evaluation Report, WCGS-AER-Z051-Rev. 0-Main Dam/Aux Spillway License Renewal Aging Evaluation Report, WCGS-AER-Z093-Rev. 1-ESW Valve House License Renewal Aging Evaluation Report, WCGS-AER-Z055A-Rev 1-Refueling Water Storage Tank Foundation / Valve House License Renewal Aging Evaluation Report, WCGS-AER-Z055C-Rev. 1-Condensate Storage Tank Foundation / Valve House License Renewal Aging Evaluation Report, WCGS-AER-Z057D-Rev. 1-Concrete Pads for Station Transformers (ESF, Startup, Main, Unit Aux, & Station Service) License Renewal Aging Evaluation Report, WCGS-AER-ZSUP-Rev. 1-Supports
Section 3.6 – Electrical and Instrument and Controls	License Renewal Aging Evaluation Report, WCGS-AER-Elect-Rev. 1-Electrical Report No. 108-2003, 10/23/2003, Infrared Thermography Report

Applicant's Aging Management Report Section	LRA-AMR Basis Document and Other Documents Reviewed
Section 4.3-Metal Fatigue Analysis	<p>Transient and Fatigue Cycle Monitoring Transient and Fatigue History Evaluation Report of Wolf Creek Nuclear Operating Corporation Wolf Creek Plant, April 1998, by Teresa A. Miller, Nuclear Projects Division, Westinghouse Electric Company P.O. Box 355 Pittsburg, Pennsylvania 15230 Nuclear Projects Division Design Specification 955238, Equipment- Piping Design Specification, ANS Safety Class 1 Standardized Nuclear Unit Power Plant System (SNUPPS) Revision 2, 12/8/1995</p> <p>Fatigue Pro Software User's Manual, Revision 3, Report No. SIR-96-102, May 1997</p> <p>WCAP-14173 Rev. 3- Nov. 1996 Global to Local Transformation and stress Transfer functions for pressurizer surge line, pressurizer lower head and pressurizer spray lines.</p>

V. Personnel Contacted or Attended NRC Meetings During Onsite Audits

NRC Project Team

Peter Wen, Team Leader
James Davis, Backup Team Leader
Duc Nguyen, Reviewer - Electrical
Dan Hoang, Reviewer - Civil/Structural
Robert Hsu, Reviewer - Materials
Surrinder Arora, Reviewer- Mechanical
Zhian Li, Reviewer- Mechanical
Bob Jackson, ATL - Materials
Erach Patel, ATL, - Mechanical
Wayne Pavinich, ATL - Mechanical

NRC Project Team Support

Kenneth Chang, Branch Chief, RER1
Veronica Rodriguez, Project Manager
Steve Cochrum, Senior Resident Inspector
Chris Long, Resident Inspector

Applicant Personnel

Matt Sunseri, VP Oversight, WCNO
Kevin Moles, Manager, Regulatory Affairs, WCNO
Harold Stubby, Supervisor, Chemistry, WCNO
Rick Denton, Supervisor, Chemistry, WCNO
Diane Hooper, Supervisor, Licensing, WCNO
Bill Ketchum, Supervisor, Nuclear Engineering, WCNO
Carlos Garcia, Supervisor, Systems Engineering, WCNO
Jess Suter, Supervisor, Fire Protection, WCNO
Dennis Tougaw, Coordinator, Inservice Inspection, WCNO
Dwight Christiansen, Thermographer, Maintenance, WCNO
Ervin Prather, Engineering, Flow-Accelerated Corrosion, WCNO
Elmer Lehmann, Engineering, Systems, WCNO
Rick Foust, Engineering, Mechanical, WCNO
Kevin Scherich, Engineering, Lake Water, WCNO
Terry Bussard, Engineering, Heat Exchanger, WCNO
Rick Rietmann, Engineering, Component Cooling Water, WCNO
Art Turner, Engineering, WCNO
Luis Solorio, Engineering, WCNO
Ron Traudt, Engineering, WCNO
Ron Holloway, Engineering, WCNO
Bill Muilenburg, Licensing, WCNO
Charles Mendency, Licensing, WCNO
Lucille Rockers, Licensing, WCNO
Ken Fredrickson, Licensing, WCNO
Lorrie Bell, License Renewal, WCNO
Deb Dixon, License Renewal, WCNO
Bill Selbe, License Renewal, WCNO
Crystal Woodruff, Chemistry, Master Tech, WCNO
Donald Naylor, WCNO
H.E. Dingler, WCNO
Len Parmenter, WCNO
Patrick Gucuel, WCNO
Ray Phelon, WCNO
Terry Garrett, WCNO
Paul Crawley, Manager, STARS-COB (Palo Verde)
Richard Schaller, STARS-COB (Palo Verde)
Eric Blocker, Project Manager, STARS-COB (Worley Parsons)
Donald Stevens, TLAA, STARS-COB (Worley Parsons)
Gary Warner, Engineering, Electrical, STARS-COB
Jim Johnson, Engineering, Structural, STARS-COB
Al Saunders, Engineering, Mechanical, STARS-COB
Gordon Chen, Engineering, STARS-COB

Observers

Wei-Chen Teng, AEC (Taiwan)
Philippe Soenen, Diablo Canyon Power Plant
Fred Polaski, Manager, License Renewal, Exelon

Cliff Coster, Project Manager, License Renewal, FENOC (Beaver Valley)
David Kunsemiller, FENOC (Beaver Valley)
Gene Eckholt, Licensing, NMC (Prairie Island)
Phil Lindberg, AMPs and TLAAs, NMC (Prairie Island)
Chalmer Myer, Southern Nuclear

VI. PROJECT TEAM'S AUDIT QUESTIONS AND APPLICANT'S RESPONSES

See attached Questions and Answers Database

Appendix A - TLAA Questions and Answer Database
Appendix B - AMP/AMR Questions and Answer Database