Nuclear Operating Company

South Texas Project Electric Generating Station P.O. Box 289 Wadsworth, Texas 77483

November 30, 2011
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10 CFR 54
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File: G25

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
One White Flint North
11555 Rockville Pike
Rockville, MD 20852

South Texas Project
Units 1 and 2
Docket Nos. STN 50-498, STN 50-499
Annual Update to the South Texas Project
License Renewal Application (TAC NOS. ME4936 and ME4937)

Reference: STPNOC Letter dated October 25, 2010, from G. T. Powell to NRC Document Control Desk, "License Renewal Application" (NOC-AE-10002607) (ML103010257)

By Reference 1, STP Nuclear Operating Company (STPNOC) submitted an application to the Nuclear Regulatory Commission (NRC) for the renewal of Facility Operating Licenses NPF-76 and NPF-80, for South Texas Project (STP) Units 1 and 2, respectively. The application included the License Renewal Application (LRA), and the Applicant's Environmental Report – Operating License Renewal Stage. As required by 10 CFR 54.21(b), each year following submittal of the LRA, an amendment to the LRA must be submitted that identifies any change to the current licensing basis (CLB) that materially affects the contents of the LRA, including the Updated Final Safety Analysis Report (UFSAR) supplement.

Enclosure 1 identifies STP LRA changes that are being made to: (1) reflect the CLB that materially affect the LRA; and (2) reflect completed enhancements and commitments. Enclosure 2 contains the affected LRA page with changes shown as mark-ups (deletions crossed out and insertion underlined). The LRA update covers the period from April 29, 2010 through August 31, 2011. As a reviewer aid, all pages of the Appendix B Aging Management Program are provided, including the unchanged pages, when there is a change to any of the pages for the affected program.

Changes to existing commitments are contained in the changes to LRA Table A4-1 in Enclosure 3. There are no other regulatory commitments in this letter.

Should you have any questions regarding this letter, please contact either Arden Aldridge, STP License Renewal Project Lead, at (361) 972-8243 or Ken Taplett, STP License Renewal Project regulatory point-of-contact, at (361) 972-8416.

A147
NRR

I declare under penalty of perjury that the foregoing is true and correct.

Executed on 11/30/2011.
Date

D. W. Rencurrel
Senior Vice President,
Technical Support & Oversight

KJT

Enclosure:
1. STPNOC License Renewal Application (LRA) Changes Reflected in Annual LRA Update
2. STP LRA Changes with Line-in/Line-out Annotations
3. Revised Regulatory Commitments

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Enclosure 1

STPNOC License Renewal Application (LRA)

Changes Reflected in

Annual LRA Update

STPNOC License Renewal Application (LRA)
Changes Reflected in Annual LRA Update

Following Changes Materially Affect the LRA	
Reason for Change	**Affected LRA Sections or Tables**
New Aging Management Program added to monitor and maintain protective coatings	Appendix A1.39 Appendix B2.1.39 Appendix B1.5 Section B2 includes: • editorial change of "XI.S.8" to XI.S8") • to reflect that AMP B2.1.38 is not used
The Lighting Diesel was added to the Scope of LRA	Table 2.2-1 Section 2.3.3 Section 2.3.3.28 Section 2.4.6 Table 2.4-6 Section 2.4.7 Section 3.3.1 Section 3.3.2 Section 3.3.2.1.28 Table 3.3.2-28 Section 3.5.2.1.6 Table 3.5.2-6 Appendix A1.14 Table A4-1 (See Enclosure 3) Appendix B2.1.14.
Revised Description of Metal Fatigue of Reactor Coolant Pressure Boundary Program to ensure that actual plant experience remains bounded by transients assumed by "fatigue crack growth analysis" as well as in design calculations.	Appendix A2.1
UFSAR Change Notice 2997 - revised the total number of primary side hydrostatic test cycles to a limit of 1 for Unit 1 that is now limited by the BMI half nozzle repair.	Table 4.3-2
Change in In-core Capsule testing order	A1.15 B2.1.15
Change to reflect agreement that if buried gray cast iron valves are removed from the fire protection system, then at least one of them will be evaluated to determine the extent of selective leaching of the valve.	Appendix B2.1.17

UFSAR Change Notice 3005 - revised the survey frequency of the Essential Cooling Pond sediment from every 5 years to every 10 years.	Appendix A1.33 Appendix B2.1.33 Table A4-1 (See Enclosure 3)
UFSAR Change Notice 3006 – revised the allowable material that can be used in the Reactor Coolant Pump closure bolting.	Section 3.1.2.1.2 Table 3.1.2-2
Addition of Solenoid Valves to scope of LRA	Table 2.3.3-6 Table 2.3.4-6 Section 3.4.2.1.6 Table 3.4.2-6 Section 3.3.2.1.6 Table 3.3.2-6 Table 2.3.3-19 Section 3.3.2.1.19 Table 3.3.2-19 Table 2.3.4-2 Section 3.4.2.1.2 Table 3.4.2-1 Table 3.4.2-2

Following Changes are Editorial Changes to the LRA	
Reason for Change	**Affected LRA Sections or Tables**
For the column "Aging Management Program" in the affected tables, reference to the "Nickel-Alloy Management" program corrected to read AMP "B2.1.34"."	Table 3.1.2-1
Typo in Section B2.1.13	B2.1.13
Corrected the NUREG reference number to "1171" for the 1986 Final Environmental Statement related to operation of the South Texas Project, Units 1 & 2	Environmental Report, Section 2.17 , Page 77 of 84

Enclosure 2

STP LRA Changes with Line-in/Line-out Annotations

CHANGE

NEW AGING MANAGEMENT PROGRAM ADDED TO MONITOR AND MAINTAIN PROTECTIVE COATINGS

A1.39 PROTECTIVE COATING MONITORING AND MAINTENANCE PROGRAM

The Protective Coating Monitoring and Maintenance Program manages loss of coating integrity for Service Level 1 coatings inside containment so that the intended functions of post-accident safety systems that rely on water recycled through the containment sump/drain system are maintained consistent with the current licensing basis. The program includes a visual examination of all reasonably accessible Service Level 1 coatings inside containment, including those applied to the steel containment liner, structural steel, supports, penetrations, uninsulated equipment, and concrete walls and floors receiving epoxy surface systems. This program does not include coating of surfaces that are insulated or otherwise enclosed in normal service and concrete receiving a non-film forming clear sealer coat only.

B2.1.39 Protective Coating Monitoring and Maintenance Program

Program Description

The Protective Coating Monitoring and Maintenance Program manages loss of coating integrity for Service Level 1 coatings inside containment so that the intended functions of post-accident safety systems that rely on water recycled through the containment sump/drain system are maintained consistent with the current licensing basis. The program includes a visual examination of all reasonably accessible Service Level 1 coatings inside containment, including those applied to the steel containment liner, structural steel, supports, penetrations, uninsulated equipment, and concrete walls and floors receiving epoxy surface systems. This program does not include coating of surfaces that are insulated or otherwise enclosed in normal service and concrete receiving a non-film forming clear sealer coat only.

General visual inspections of the containment building Service Level 1 coatings are conducted as part of the ASME Section XI, Subsection IWE program and the Structures Monitoring Program at intervals not exceeding five years. Additional inspections may be necessary depending on inspection results. Thorough visual inspections are performed on previously designated areas and on areas noted as deficient during the inspection. Characterization of deficient areas is performed to allow evaluation of the deficiency for future surveillance or repair, and prioritization of repairs. Characterization of blistering, cracking, flaking, peeling, de-lamination, and rusting is consistent with applicable ASTM standards. Physical testing may be performed when directed by the evaluator. Examinations are conducted by qualified personnel.

Service Level I coatings are not credited for managing loss of material of the steel containment liner.

Aging Management Program Elements

The results of an evaluation of each element against the 10 elements described in Appendix A of NUREG-1800, Standard Review Plan for Review of License Renewal Applications for Nuclear Power Plants are provided below.

Scope of Program (Element 1)

The Protective Coating Monitoring and Maintenance Program includes a visual examination of all reasonably accessible Service Level 1 coatings inside containment, including those applied to the steel containment liner, structural steel, supports, penetrations, uninsulated equipment, and concrete walls and floors receiving epoxy surface systems. This program pertains to the containment interior and equipment, structures or components which are permanently located inside containment. This program does not include coating of surfaces that are insulated or otherwise enclosed in normal service and concrete receiving a non-film forming clear sealer coat only.

Service Level I coatings are not credited for preventing loss of material due to corrosion for the steel containment liner. (See AMP XI.S1, ASME Section XI, Subsection IWE)

Preventive Actions (Element 2)

The Protective Coating Monitoring and Maintenance Program does not prevent degradation due to aging effects but provides measures for monitoring to detect the degradation prior to loss of intended function. Coatings are not credited for preventing loss of material.

Parameters Monitored or Inspected (Element 3)

The Protective Coating Monitoring and Maintenance Program inspects coated surfaces for flaking, blistering, cracking, de-lamination, peeling, or rusting. Any areas of coating discoloration or areas where corrosion has formed under the coating system are documented and evaluated.

Detection of Aging Effects (Element 4)

The South Texas Project (STP) periodically conducts condition assessments of Service Level 1 coatings inside containment as part of the ASME Section XI, Subsection IWE program and the Structures Monitoring Program at intervals not exceeding five years. Additional inspections may be necessary depending on inspection results. Visual inspection of coatings in containment is intended to characterize the condition of the coating systems. In some cases, a complete inspection is not possible due to inaccessibility. For these cases, the coating systems are characterized based on an inspection of coating systems that are reasonably accessible or based on a representative sample. If localized areas of degraded coatings are identified, those areas are evaluated and scheduled for repair/replacement, as necessary. The periodic condition assessments, and the resulting repair/replacement activities, assure that the amount of Service Level 1 coatings which may be susceptible to detachment from the substrate during a loss-of-coolant accident design basis event is minimized.

Monitoring and Trending (Element 5)

Prior to performing the inspection, the inspector reviews previous coating condition assessment reports. The inspection reports prioritize repair areas as either needing repair during the same outage or as postponed to future outages.

The containment liner plate is inspected as part of the ASME Section XI, Subsection IWE inspection program. The results of this inspection are reviewed to assist in identifying areas of degraded or damaged coating.

Acceptance Criteria (Element 6)

Potentially defective coating surfaces identified during the course of an inspection are documented, their severity is evaluated, and corrective actions are taken to ensure there is no loss of intended functions between the inspections. Defective or deficient coating surfaces are prioritized as either needing repair during the same outage or as postponed to future outages. The evaluation covers blistering, cracking, flaking, peeling, de-lamination, and rusting as specified below.

Blistering—Compare any blistering found to the blistering pictorial standards of coatings defects and record size and frequency. If the blisters are larger than those on the comparison photographs, measure, record size and extent, and photograph. Report if blistered portions are intact.

Cracking—Cracking may be limited to the one layer of coating or extend through to the substrate. Measure the length of the crack or if extensive cracking has occurred, measure the size of the area affected. Determine if the cracking is isolated or is part of a pattern. Record measurements and describe crack depth and pattern on the inspection report. Photograph the area affected.

Flaking/Peeling/De-lamination—Measure the approximate size of the degraded coating area and note the pattern formed. Carefully test to see if lifting can be easily achieved beyond the obvious peeled area. Note all observations including location of failure within the coating film, whether the failure is cohesive or adhesive, etc., on the inspection report and photograph the area affected.

Rusting—Compare with the pictorial standards to determine the degree of rusting. Try to determine the source of rusting (that is, is it surface stain caused by rusting elsewhere, or is it a failure of the coating allowing the substrate to rust). Photograph the affected area and record observations on the inspection report.

If no defects are found, mark "Coating Intact, No Defects" on the inspection report.

If portions of the coating cannot be inspected, note the specific areas on the inspection report, along with the reason why the inspection cannot be conducted.

Written or photographic documentation, or both, of coating inspection areas, failures, and defects shall be made and the process of documentation standardized by the facility owner/operator.

For coating surfaces determined to be suspect, defective, or deficient, physical tests, such as dry film thickness and adhesion may be performed when directed by the Nuclear Coating Specialist. Samples may be gathered, and the size and extent of defective patterns may be described.

Corrective Actions (Element 7)

STP site Quality Assurance (QA) procedures, review and approval process, and administrative controls are implemented in accordance with the requirements of 10 CFR 50 Appendix B and are acceptable in addressing corrective actions. The QA program includes elements of corrective action, and is applicable to the safety-related and nonsafety-related systems, structures and components that are subject to aging management review.

Confirmation Process (Element 8)

STP site QA procedures, review and approval process, and administrative controls are implemented in accordance with the requirements of 10 CFR 50 Appendix B and are acceptable in addressing confirmation processes and administrative controls. The QA program includes elements of corrective action, and is applicable to the safety-related and nonsafety-related systems, structures and components that are subject to aging management review.

Administrative Controls (Element 9)

STP site QA procedures, review and approval process, and administrative controls are implemented in accordance with the requirements of 10 CFR 50 Appendix B and are acceptable in addressing confirmation processes and administrative controls. The QA program includes elements of corrective action, and is applicable to the safety-related and nonsafety-related systems, structures and components that are subject to aging management review.

Operating Experience (Element 10)

STP has implemented controls for the procurement, application, and maintenance of Service Level 1 protective coatings used inside containment in a manner that is consistent with the licensing basis and regulatory requirements applicable to STP. The requirements of 10 CFR 50 Appendix B are implemented through specification of appropriate technical and quality requirements for the Service Level 1 coatings program which includes ongoing maintenance activities.

For STP, Service Level 1 coatings have been tested, selected, and applied to assure that they will withstand nuclear, chemical, and physical conditions of a Design Basis Accident, as required by Nuclear Regulatory Commission Regulatory Guide (RG) 1.54, Rev. 0, and ANSI N101.2- 1972. Coatings used inside the containment have been established as safety-related, thus imposing the quality assurance requirements of Appendix B to 10 CFR Part 50.

The South Texas Project periodically conducts condition assessments of Service Level 1 coatings inside containment. Coating condition assessments are conducted as part of the structures monitoring program. The structures monitoring program covers the baseline inspection and subsequent inspections that are conducted at intervals not exceeding five years.

Enhancements

None

Conclusion

The continued implementation of the Protective Coating Monitoring and Maintenance Program provides reasonable assurance that aging effects will be managed such that the systems and components within the scope of this program will continue to perform their intended functions consistent with the current licensing basis for the period of extended operation.

B1.5 AGING MANAGEMENT PROGRAMS

The following aging management programs are described in the sections listed in this appendix. The programs are either discussed in NUREG-1801 or are plant-specific.

- ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (Section B2.1.1)
- Water Chemistry (Section B2.1.2)
- Reactor Head Closure Studs (Section B2.1.3)
- Boric Acid Corrosion (Section B2.1.4)
- Nickel-Alloy Penetration Nozzles Welded To The Upper Reactor Vessel Closure Heads of Pressurized Water Reactors (Section B2.1.5)
- Flow-Accelerated Corrosion (Section B2.1.6)
- Bolting Integrity (Section B2.1.7)
- Steam Generator Tube Integrity (Section B2.1.8)
- Open-Cycle Cooling Water System (Section B2.1.9)
- Closed-Cycle Cooling Water System (Section B2.1.10)
- Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems (Section B2.1.11)
- Fire Protection (Section B2.1.12)
- Fire Water System (Section B2.1.13)
- Fuel Oil Chemistry (Section B2.1.14)
- Reactor Vessel Surveillance (Section B2.1.15)
- One-Time Inspection (Section B2.1.16)
- Selective Leaching of Materials (Section B2.1.17)
- Buried Piping and Tanks Inspection (Section B2.1.18)
- One-Time Inspection of ASME Code Class 1 Small-Bore Piping (Section B2.1.19)
- External Surfaces Monitoring Program (Section B2.1.20)
- Flux Thimble Tube Inspection (Section B2.1.21)

- Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (Section B2.1.22)
- Lubricating Oil Analysis (Section B2.1.23)
- Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements (Section B2.1.24)
- Inaccessible Medium Voltage Cables Not Subject to 10 CFR 50.49 Environmental Qualification Requirements (Section B2.1.25)
- Metal Enclosed Bus (Section B2.1.26)
- ASME Section XI, Subsection IWE (Section B2.1.27)
- ASME Section XI, Subsection IWL (Section B2.1.28)
- ASME Section XI, Subsection IWF (Section B2.1.29)
- 10 CFR 50, Appendix J (Section B2.1.30)
- Masonry Wall Program (Section B2.1.31)
- Structures Monitoring Program (Section B2.1.32)
- RG 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants (Section B2.1.33)
- Nickel-Alloy Aging Management Program (Section B2.1.34)
- PWR Reactor Internals (Section B2.1.35)
- Electrical Cable Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements (Section B2.1.36)
- Selective Leaching of Aluminum Bronze (B2.1.37)
- Protective Coating Monitoring and Maintenance Program B2.1.39

B2 AGING MANAGEMENT PROGRAMS

The correlation between NUREG-1801, Generic Aging Lessons Learned programs and STP programs is shown below. For STP programs, links to appropriate sections of this appendix are provided.

NUREG-1801 NUMBER	NUREG-1801 PROGRAM	PLANT PROGRAM	EXISTING OR NEW	APPENDIX B REFERENCE
XI.S7	RG 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants	RG 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants	Existing	B2.1.33
XI.S8	Protective Coating Monitoring and Maintenance Program	Not Credited	N/A	N/A
X.M1	Metal Fatigue of Reactor Coolant Pressure Boundary	Metal Fatigue of Reactor Coolant Pressure Boundary	Existing	B3.1
X.E1	Environmental Qualification (EQ) of Electrical Components	Environmental Qualification (EQ) of Electrical Components	Existing	B3.2
X.S1	Concrete Containment Tendon Prestress	Concrete Containment Tendon Prestress	Existing	B3.3
N/A	Plant-Specific	Nickel-Alloy Aging Management Program	Existing	B2.1.34
N/A	Plant-Specific	PWR Reactor Internals	New	B2.1.35
N/A	Plant-Specific	Selective Leaching of Aluminum Bronze	Existing	B2.1.37
N/A	Plant-Specific	Not used	N/A	B2.1.38
N/A	Plant-Specific	Protective Coating Monitoring and Maintenance Program	Existing	B2.1.39

CHANGE

THE LIGHTING DIESEL WAS ADDED TO THE SCOPE OF LRA

Table 2.2-1 STP Scoping Results

System/Structure	In-Scope	Section 2 Scoping Results
Reactor Vessel, Internals, and Reactor Coolant System		
Pressurizer	Yes	2.3.1.3
Reactor Coolant	Yes	2.3.1.2
Reactor Core	Yes	2.3.1.5
Reactor Vessel and Internals	Yes	2.3.1.1
Steam Generator also includes: Steam Generator Secondary Side	Yes	2.3.1.4
Engineered Safety Features		
Containment Spray	Yes	2.3.2.1
Integrated Leak Rate Test	Yes	2.3.2.2
Residual Heat Removal	Yes	2.3.2.3
Safety Injection	Yes	2.3.2.4
Auxiliary Systems		
Chemical and Volume Control	Yes	2.3.3.19
Chilled Water HVAC	Yes	2.3.3.9
Component Cooling Water	Yes	2.3.3.6
Compressed Air Systems also includes: Breathing Air Instrument Air Service Air	Yes	2.3.3.7
Containment Hydrogen Monitoring and Combustible Gas Control	Yes	2.3.3.16

Table 2.2-1 STP Scoping Results (Continued)

System/Structure	In-Scope	Section 2 Scoping Results
Cranes and Hoists	Yes	2.3.3.3
Nonsafety-related Diesel Generators and Auxiliary Fuel Oil, includes: BOP Diesel Auxiliary Fuel Oil	Yes	2.3.3.21
Diesel Generator Building HVAC	Yes	2.3.3.15
Electrical Auxiliary Building and Control Room HVAC	Yes	2.3.3.10
Essential Cooling Water and Essential Cooling Water Screen Wash	Yes	2.3.3.4
Fire Protection	Yes	2.3.3.17
Fuel Handling	Yes	2.3.3.1
Fuel Handling Building HVAC	Yes	2.3.3.11
Lighting Diesel Generator	Yes	2.3.3.28
Liquid Waste Processing	Yes	2.3.3.22
Mechanical Auxiliary Building HVAC	Yes	2.3.3.12
Miscellaneous HVAC, includes: Essential Cooling Water Intake Structure Fire Pump House	Yes	2.3.3.13
Miscellaneous systems in-scope ONLY for Criterion a(2) Includes: Boron Recycling Condensate Storage Condensate includes: - BOP Chemical Feed - Condensate Polisher - Condenser Air Removal Essential Cooling Pond Makeup Gaseous Waste Processing Low Pressure Nitrogen MAB Plant Vent Header (Radioactive) Nonradioactive Chemical Waste Open Loop Auxiliary Cooling Potable Water and Well Water Secondary Process Sampling Solid Waste Processing Turbine Vents and Drains	Yes	2.3.3.27
Nonradioactive Waste Plumbing Drains and Sumps	Yes	2.3.3.24
Oily Waste	Yes	2.3.3.25

Table 2.2-1 STP Scoping Results (Continued)

System/Structure	In-Scope	Section 2 Scoping Results
Primary Process Sampling also includes: Post Accident Sampling	Yes	2.3.3.8
Radiation Monitoring (area and process) Mechanical	Yes	2.3.3.26
Radioactive Vents and Drains	Yes	2.3.3.23
Reactor Containment Building HVAC	Yes	2.3.3.14
Reactor Makeup Water	Yes	2.3.3.5
Spent Fuel Pool Cooling and Cleanup	Yes	2.3.3.2
Standby Diesel Generator and Auxiliaries also includes: Standby Diesel Generator Air Intake Standby Diesel Generator Exhaust Standby Diesel Jacket Water Standby Diesel Generator Lube Oil Standby Diesel Generator Starting Air	Yes	2.3.3.20
Standby Diesel Generator Fuel Oil Storage and Transfer	Yes	2.3.3.18
Chemical Injection Monitoring and Control	No	N/A
Closed Loop Auxiliary Cooling Water	No	N/A
Fresh Water and Service Water Supply also includes: Sodium Hypochlorite Fresh Water Service Water	No	N/A
Circulating Water also includes: Seal Water and Priming (Circulating Water) Circulating Water Screen Wash	No	N/A
Turbine Generator Building HVAC	No	N/A
Gas Storage and Supply includes: Gas CO_2 Storage Gas H_2 Storage Gas N_2 High Pressure Supply	No	N/A
Miscellaneous HVAC (Not In Scope)	No	N/A
Nonradioactive Waste also includes: Sewage Treatment	No	N/A
Reservoir Makeup and Blowdown also includes: Reservoir Makeup Pumping RMPF Seal Water RMPF Screen Wash Cooling Water Reservoir Spillway Gates and Blowdown Facilities	No	N/A
Water Processing also includes: Acid Storage and Transfer Caustic Storage and Transfer	No	N/A

Table 2.2-1 STP Scoping Results (Continued)

System/Structure	In-Scope	Section 2 Scoping Results
Steam and Power Conversion System		
Auxiliary Feedwater	Yes	2.3.4.6
Auxiliary Steam System and Boilers	Yes	2.3.4.2
Demineralizer Water (Make-up)	Yes	2.3.4.4
Electrohydraulic Control	Yes	2.3.4.7
Feedwater	Yes	2.3.4.3
Main Steam also includes: Main Steam Vents and Drains Header Drain Downstream -	Yes	2.3.4.1
Steam Generator Blowdown also includes: Steam Generator Sludge Lancing and Chemical Cleaning	Yes	2.3.4.5
Feed Pump Turbine Lube Oil	No	N/A
Lube Oil Purification Storage and Transfer also includes: Lube Oil Conditioner	No	N/A
Main Turbine	No	N/A
Turbine/Generator Auxiliaries also includes: Extraction Steam Stator Cooling Water Generator CO_2 and H_2 Turbine Gland Seal Heater Drip Heater Vent Main Turbine Lube Oil Turbine Vents and Drains Generator Hydrogen Seal Oil	No	N/A
Containments, Structures, and Component Supports		
Auxiliary Feedwater Storage Tank Foundation and Shell	Yes	2.4.10
Containment Building	Yes	2.4.1
Control Room	Yes	2.4.2
Diesel Generator Building	Yes	2.4.3
Electrical Foundations and Structures	Yes	2.4.7
Essential Cooling Water Structures also includes: Essential Cooling Water Intake Structure Essential Cooling Pond and ECW Discharge	Yes	2.4.9
Fuel Handling Building	Yes	2.4.8

Table 2.2-1 STP Scoping Results (Continued)

System/Structure	In-Scope	Section 2 Scoping Results
Mechanical-Electrical Auxiliary Building (MEAB) also includes: Electrical Auxiliary Building Mechanical Auxiliary Building Isolation Valve Cubicle (Building)	Yes	2.4.5
Miscellaneous Yard Areas and Buildings (In-Scope) also includes: East Gate House Fire pump house Fire water storage tanks foundations Fire water valve structures Lighting Diesel Generator Building and tank building	Yes	2.4.6
Supports	Yes	2.4.11
Turbine Generator Building	Yes	2.4.4

Table 2.2-1 STP Scoping Results (Continued)

System/Structure	In-Scope	Section 2 Scoping Results
Miscellaneous Structures includes: Administration Building Ambulance Building Aux Fuel Oil Transfer Pump Station, tank foundation, and dike Bulk Gas Storage Facility Chemical and Gas Storage Circulating Water Intake Structure Circulating Water Discharge Structure Cold Chemistry Lab ~~East Gate House~~ Electrical Load Center Buildings Emergency Operations Facility Foam Equipment House Fuel Storage Facility Guard Facility, Gates, and Fences Hot Shop and Decontamination Facility Hypochlorination Building Inverter Building ~~Lighting Diesel Generator Building~~ Machine Shop Main Cooling Reservoir Maintenance Coatings Storage Structure Maintenance Lubrication Storage Structure Maintenance Operations Facility Makeup Demineralizer Building Microwave Building NPMM Product Staging Structure North Gate House Nuclear Training Facility (Training and Simulator Building) Old Reactor Vessel Head Storage Building Old Steam Generator Storage Facility On-Site Staging Facility Refueling Equipment Building (Cement Unloading Building) Sewage Treatment Building Spillway and Blowdown Facilities Storm Water Drainage System (Including the roof drains) TSC Diesel Generator Building Temporary Gate House Unit 1 Stop Shop Unit 2 Change Facility Unit 2 Stop Shop Warehouse Annex Warehouse No. 29 (Includes Outage Facility West Gate House	No	N/A
Electrical and Instrumentation and Controls		
120 VAC Class 1E Vital	Yes	N/A
120 VAC Non-1E Vital	Yes	N/A

Table 2.2-1 STP Scoping Results (Continued)

System/Structure	In-Scope	Section 2 Scoping Results
125 VDC Class 1E	Yes	N/A
125 VDC Non-Class 1E	Yes	N/A
480 VAC Non-1E Load Centers	Yes	N/A
480 VAC Class 1E Load Centers	Yes	N/A
480 VAC Class 1E MCC and Distribution Panels	Yes	N/A
480 VAC Non-1E MCC and Distribution Panels	Yes	N/A
4K VAC 1E Power	Yes	N/A
13.8K VAC Aux Power	Yes	N/A
7300 Processor Support	Yes	N/A
Communication	Yes	N/A
Emergency AC Lighting	Yes	N/A
Emergency DC Lighting	Yes	N/A
Engineered Safety Features Actuation	Yes	N/A
Fire Alarm and Detection	Yes	N/A
Incore Instrumentation	Yes	N/A
Main and Auxiliary Transformers	Yes	N/A
Nuclear Instrumentation	Yes	N/A
Panels and Cabinets	Yes	N/A
Post Accident Monitoring	Yes	N/A
Radiation Monitoring (Area and Process)	Yes	N/A
Rod Control	Yes	N/A
Solid State Protection	Yes	N/A
Standby Transformer (Startup)	Yes	N/A
Switchyard	Yes	N/A
208/120 VAC Non Class 1E Non-Vital System -	No	N/A

Table 2.2-1 STP Scoping Results (Continued)

System/Structure	In-Scope	Section 2 Scoping Results
250 VDC Non-Class 1E	No	N/A
48 VDC Non-Class 1E	No	N/A
4K VAC Non-class 1E Power	No	N/A
13.8K V Emergency Power	No	N/A
Annunciator	No	N/A
Cathodic Protection	No	N/A
~~Diesel Generator (Lighting)~~	~~No~~	~~N/A~~
Electrical Miscellaneous.	No	N/A
Emergency Transformer	No	N/A
Environmental (Meteorological Tower)	No	N/A
ESF Status Monitoring	No	N/A
Freeze Protection	No	N/A
Generator Isophase Bus and Aux	No	N/A
Grounding and Lightning Protection	No	N/A
Integrated Computer	No	N/A
Loose Parts Monitoring	No	N/A
Main Generator (w/o Aux)	No	N/A
Main Generator Exciter	No	N/A
Normal AC Lighting	No	N/A
Plant Computer	No	N/A
River Services, Transformer and Switchgear	No	N/A
Rod Position Indicator	No	N/A
Seismic Monitoring	No	N/A
Vibration Monitoring	No	N/A

2.3.3 Auxiliary Systems

This section addresses scoping and screening results for the following systems:

- Fuel handling (Section 2.3.3.1)
- Spent fuel pool cooling and cleanup (Section 2.3.3.2)
- Cranes and hoists (Section 2.3.3.3)
- Essential cooling water and ECW screen wash (Section 2.3.3.4)
- Reactor makeup water (Section 2.3.3.5)
- Component cooling water (Section 2.3.3.6)
- Compressed air (Section 2.3.3.7)
- Primary process sampling (Section 2.3.3.8)
- Chilled water HVAC (Section 2.3.3.9)
- Electrical auxiliary building and control room HVAC (Section 2.3.3.10)
- Fuel handling building HVAC (Section 2.3.3.11)
- Mechanical auxiliary building HVAC (Section 2.3.3.12)
- Miscellaneous HVAC (In Scope) (Section 2.3.3.13)
- Reactor containment building HVAC (Section 2.3.3.14)
- Standby diesel generator building HVAC (Section 2.3.3.15)
- Containment hydrogen monitoring and combustible gas control (Section 2.3.3.16)
- Fire protection (Section 2.3.3.17)
- Standby diesel generator fuel oil storage and transfer (Section 2.3.3.18)
- Chemical and volume control (Section 2.3.3.19)
- Standby diesel generator and auxiliaries (Section 2.3.3.20)
- Nonsafety-related diesel generators and auxiliary fuel oil (Section 2.3.3.21)
- Liquid waste processing (Section 2.3.3.22)
- Radioactive vents and drains (Section 2.3.3.23)
- Nonradioactive waste plumbing drains and sumps (Section 2.3.3.24)
- Oily waste (Section 2.3.3.25)
- Radiation monitoring (area and process) mechanical (Section 2.3.3.26)
- Miscellaneous systems in-scope ONLY for Criterion a(2) (Section 2.3.3.27)
  Includes:
  Boron recycling
  Condensate storage
  Condensate, also includes:
  - BOP chemical feed
  - Condensate polisher
  - Condenser air removal

  Essential cooling pond makeup
  Gaseous waste processing
  Low pressure nitrogen
  MAB plant vent header (radioactive)
  Nonradioactive chemical waste
  Open loop auxiliary cooling
  Potable water and well water
  Secondary process sampling
  Solid waste processing

Turbine vents and drains

- Lighting diesel generator (Section 2.3.3.28)

2.3.3.28 Lighting Diesel Generator System

System Description

The purpose of the lighting diesel generator system is to provide lighting to operator access routes to various safe shutdown components requiring travel outside of buildings. This lighting is powered from the lighting diesel generator during loss of offsite power.

The lighting diesel generator system consists of piping, tanks, and valves.

System Intended Functions

Portions of the lighting diesel generator system are within the scope of license renewal to support fire protection requirements based upon criteria of 10 CFR 54.4(a)(3).

STP UFSAR References

None

License Renewal Boundary Drawings

The license renewal drawing for the lighting diesel generator system is listed below:

LR-STP-DB-6Q170F00011-1

Component-Function Relationship Table

The component types subject to aging management review are indicated in Table 2.3.3-28 – Lighting Diesel Generator System.

Table 2.3.3-28 Lighting Diesel Generator System

Component Type	Intended Function
Closure Bolting	Pressure Boundary
Flame Arrestor	Pressure Boundary
Flexible Hoses	Pressure Boundary
Piping	Pressure Boundary
Silencer	Pressure Boundary
Tank	Pressure Boundary
Tubing	Pressure Boundary
Valve	Pressure Boundary

The AMR results for these component types are provided in Table 3.3.2-28, Auxiliary Systems – Summary of Aging Management Evaluation – Lighting Diesel Generator System.

2.4.6 Miscellaneous Yard Areas and Buildings (In Scope)

Structure Description

The miscellaneous yard areas and buildings (in scope) include the following structures:

- east gate house
- fire pump house
- fire water storage tanks foundations
- fire water valve structures
- lighting diesel generator building and tank building

The east gate house is a steel-framed building with a metal roof and a concrete foundation. It houses administrative offices and various mechanical and electrical support systems.

The fire pump house is a metal building with a sheet metal roof on a concrete foundation housing three fire pumps, each separated by reinforced concrete walls. The structure is common to both Units 1 and 2.

The fire water storage tanks foundations are reinforced concrete ring foundations. The fire water storage tanks are evaluated separately with their respective system. These two foundations are common to both Units 1 and 2.

The fire water valve structures are metal buildings with sheet metal roofing on a concrete foundation. There are three valve structures per unit.

The lighting diesel generator building and tank building are masonry buildings with metal roofs and concrete foundations. They house the lighting diesel generator, the diesel fuel supply tank, and various mechanical and electrical support systems.

Structure Intended Function

The miscellaneous yard areas and buildings (in scope) shelter and protect nonsafety-related SSCs whose failure could prevent performance of a safety-related function. Therefore, the miscellaneous yard areas and buildings (in scope) are within the scope of license renewal based on the criterion of 10 CFR 54.4(a)(2).

The fire pump house provides fire barriers and structural support for fire suppression components. The fire water storage tank foundations and fire water valve structures provide structural support and shelter/protection for fire protection components. The lighting diesel generator building, the tank building, and the east gate house provide structural support and shelter/protection for SSCs required to meet fire protection commitments. Therefore, these structures are within the scope of license renewal based on the criteria of 10 CFR 54.4(a)(3).

STP UFSAR References

Additional details of the miscellaneous yard areas and buildings (In Scope) are included in UFSAR Sections 9.5.1.2.1, 9.5.1.2.17.2 and Tables 1.1-3, 3.2.A-1.

Component-Functional Relationship Table

The components types subject to aging management review are indicated in Table 2.4-6 0 Miscellaneous Yard Areas and Buildings (In Scope)

Table 2.4-6 Miscellaneous Yard Areas and Buildings (In Scope)

Component Type	Intended Function
Caulking and Sealant	Flood Barrier Shelter, Protection
Compressible Joints and Seals	Shelter, Protection
Concrete Block (Masonry Walls)	Shelter, Protection Structural Support
Concrete Elements	Fire Barrier Flood Barrier Missile Barrier Shelter, Protection Structural Support
Doors	Shelter, Protection
Fire Barrier Doors	Fire Barrier Shelter, Protection
Fire Barrier Seals	Fire Barrier
Gypsum and Plaster Barrier	Shelter, Protection
Metal Siding	Shelter, Protection
Penetrations Electrical	Structural Support
Penetrations Mechanical	Structural Support
Structural Metals	Shelter, Protection Structural Support
Structural Steel	Shelter, Protection Structural Support

The AMR results for these components types are provided in Table 3.5.2-6, Containments, Structures, and Component Supports – Summary of Aging Management Evaluation-Miscellaneous Yard Areas and Buildings (In Scope).

2.4.7 Electrical Foundations and Structures

Structure Description

The foundations for the main, auxiliary, and standby transformers are reinforced concrete pads founded on undisturbed soil and/or engineered structural backfill. All oil-filled transformers are provided with pits to catch any transformer oil which may be released due to a leak or rupture.

Outdoor switchgear, in the 345 kV switchyard, and all equipment from the main and standby transformers up to the first circuit breakers in the 345 kV switchyard, are supported on reinforced concrete pads founded on undisturbed soil and/or engineered structural backfill.

The switchyard control building is a single story metal-sided structure with a sheet metal roof. The building is supported by a reinforced concrete foundation on structural backfill. The switchyard control building houses equipment required by SBO requirements.

All of the transmission towers up to the first circuit breakers in the 345 kV switchyard are steel towers. The transmission towers are founded on reinforced concrete bases supported on undisturbed soil and/or engineered structural backfill.

The yard lighting is mounted on high mast steel poles founded on reinforced concrete bases supported on undisturbed soil and/or engineered structural backfill.

The Class 1E underground electrical raceway system provides electrical distribution from the MEAB to the essential cooling water intake structure. The raceway system consists of banks of PVC conduits in a spaced arrangement encased in reinforced concrete. Manholes are provided along these duct banks for cable installation and access.

The main and auxiliary transformers are separated by concrete fire barrier walls.

Structure Intended Function

The Class 1E underground electrical raceway system provides structural support and shelter/protection of components relied upon to provide the capability to shutdown the reactor and maintain it in a safe shutdown condition. Therefore, it is within the scope of license renewal based on the criteria of 10 CFR 54.4(a)(1).

The concrete pads for the main transformers, auxiliary transformers, standby transformers, the concrete pads for the outdoor switchgear, the switchyard control building, and concrete bases for the transmission towers, provide structural support for SSCs required for station blackout recovery. The concrete fire barrier walls separating the main and auxiliary transformers provide spatial separation and fire barriers to meet the requirements for fire protection. The concrete duct banks and manholes provide structural support, shelter and protection for SSCs required for fire protection. The high mast yard lighting poles provide structural support for SSCs required to meet fire protection commitments. Therefore, they are within the scope of license renewal based on the criteria of 10 CFR 54.4(a)(3).

3.3 AGING MANAGEMENT OF AUXILIARY SYSTEMS

3.3.1 Introduction

Section 3.3 provides the results of the aging management reviews (AMRs) for those component types identified in Section 2.3.3, Auxiliary Systems, subject to AMR. These systems are described in the following sections:

- Fuel handling system (Section 2.3.3.1)
- Spent fuel pool cooling and cleanup system (Section 2.3.3.2)
- Cranes and hoists (Section 2.3.3.3)
- Essential cooling water and ECW screen wash system (Section 2.3.3.4)
- Reactor makeup water system (Section 2.3.3.5)
- Component cooling water system (Section 2.3.3.6)
- Compressed air system (Section 2.3.3.7)
- Primary process sampling system (Section 2.3.3.8)
- Chilled water HVAC system (Section 2.3.3.9)
- Electrical auxiliary building and control room HVAC system (Section 2.3.3.10)
- Fuel handling building HVAC system (Section 2.3.3.11)
- Mechanical auxiliary building HVAC system (Section 2.3.3.12)
- Miscellaneous HVAC systems (In Scope) (Section 2.3.3.13)
- Containment building HVAC system (Section 2.3.3.14)
- Standby diesel generator building HVAC system (Section 2.3.3.15)
- Containment hydrogen monitoring and combustible gas control system (Section 2.3.3.16)
- Fire protection system (Section 2.3.3.17)
- Standby diesel generator fuel oil storage and transfer system (Section 2.3.3.18)
- Chemical and volume control system (Section 2.3.3.19)
- Standby diesel generator and auxiliaries system (Section 2.3.3.20)
- Nonsafety-related diesel generators and auxiliary fuel oil system (Section 2.3.3.21)
- Liquid waste processing system (Section 2.3.3.22)
- Radioactive vents and drains system (Section 2.3.3.23)
- Nonradioactive waste plumbing drains and sumps system (Section 2.3.3.24)

- Oily waste system (Section 2.3.3.25)
- Radiation monitoring (area and process) mechanical system (Section 2.3.3.26)
- Miscellaneous Systems in scope ONLY for Criterion 10 CFR 54.4(a)(2) (Section 2.3.3.27) includes:
  Boron recycling
  Condensate storage
  Condensate
  Essential cooling pond makeup
  Gaseous waste processing
  Low pressure nitrogen
  MAB plant vent header (radioactive)
  Nonradioactive chemical waste
  Open loop auxiliary cooling
  Potable water and well water
  Secondary process sampling
  Solid waste processing
  Turbine vents and drains
- Lighting diesel generator system (Section 2.3.3.28)

Table 3.3.1, Summary of Aging Management Evaluations in Chapter VII of NUREG-1801 for Auxiliary Systems, provides the summary of the programs evaluated in NUREG-1801 that are applicable to the component types in this section. Table 3.3.1 uses the format of Table 1 described in Section 3.0.

3.3.2 Results

The following tables summarize the results of the AMR for the systems in the Auxiliary Systems area:

- Table 3.3.2-1 Auxiliary Systems – Summary of Aging Management Evaluation – Fuel Handling System
- Table 3.3.2-2 Auxiliary Systems – Summary of Aging Management Evaluation – Spent Fuel Pool Cooling and Cleanup System
- Table 3.3.2-3 Auxiliary Systems – Summary of Aging Management Evaluation – Cranes and Hoists
- Table 3.3.2-4 Auxiliary Systems – Summary of Aging Management Evaluation – Essential Cooling Water and ECW Screen Wash System
- Table 3.3.2-5 Auxiliary Systems – Summary of Aging Management Evaluation – Reactor Makeup Water System
- Table 3.3.2-6 Auxiliary Systems – Summary of Aging Management Evaluation – Component Cooling Water System
- Table 3.3.2-7 Auxiliary Systems – Summary of Aging Management Evaluation – Compressed Air System

- Table 3.3.2-8 Auxiliary Systems – Summary of Aging Management Evaluation – Primary Process Sampling System
- Table 3.3.2-9 Auxiliary Systems – Summary of Aging Management Evaluation – Chilled Water HVAC System
- Table 3.3.2-10 Auxiliary Systems – Summary of Aging Management Evaluation – Electrical Auxiliary Building and Control Room HVAC System
- Table 3.3.2-11 Auxiliary Systems – Summary of Aging Management Evaluation – Fuel Handling Building HVAC System
- Table 3.3.2-12 Auxiliary Systems – Summary of Aging Management Evaluation – Mechanical Auxiliary Building HVAC System
- Table 3.3.2-13 Auxiliary Systems – Summary of Aging Management Evaluation – Miscellaneous HVAC Systems (In Scope)
- Table 3.3.2-14 Auxiliary Systems – Summary of Aging Management Evaluation – Containment Building HVAC System
- Table 3.3.2-15 Auxiliary Systems – Summary of Aging Management Evaluation – Standby Diesel Generator Building HVAC System
- Table 3.3.2-16 Auxiliary Systems – Summary of Aging Management Evaluation – Containment Hydrogen Monitoring and Combustible Gas Control System
- Table 3.3.2-17 Auxiliary Systems – Summary of Aging Management Evaluation – Fire Protection System
- Table 3.3.2-18 Auxiliary Systems – Summary of Aging Management Evaluation – Standby Diesel Generator Fuel Oil Storage and Transfer System
- Table 3.3.2-19 Auxiliary Systems – Summary of Aging Management Evaluation – Chemical and Volume Control System
- Table 3.3.2-20 Auxiliary Systems – Summary of Aging Management Evaluation – Standby Diesel Generator and Auxiliaries System
- Table 3.3.2-21 Auxiliary Systems – Summary of Aging Management Evaluation – Nonsafety-related Diesel Generators and Auxiliary Fuel Oil System
- Table 3.3.2-22 Auxiliary Systems – Summary of Aging Management Evaluation – Liquid Waste Processing System
- Table 3.3.2-23 Auxiliary Systems – Summary of Aging Management Evaluation – Radioactive Vents and Drains System
- Table 3.3.2-24 Auxiliary Systems – Summary of Aging Management Evaluation – Nonradioactive Waste Plumbing Drains and Sump System
- Table 3.3.2-25 Auxiliary Systems – Summary of Aging Management Evaluation – Oily Waste System
- Table 3.3.2-26 Auxiliary Systems – Summary of Aging Management Evaluation – Radiation Monitoring (area and process) Mechanical System
- Table 3.3.2-27 Auxiliary Systems – Summary of Aging Management Evaluation – Miscellaneous Systems in scope ONLY for Criterion 10 CFR 54.4(a)(2)

- Table 3.3.2-28 Auxiliary Systems – Summary of Aging Management Evaluation – Lighting Diesel Generator System

These tables use the format of Table 2 discussed in Section 3.0.

3.3.2.1.28 Lighting Diesel Generator

Materials

The materials of construction for the lighting diesel generator component types are:

- Carbon Steel
- Copper Alloy (> 15% Zinc)
- Elastomer
- Stainless Steel

Environment

The lighting diesel generator component types are exposed to the following environments:

- Atmosphere/ Weather
- Buried
- Closed Cycle Cooling Water
- Diesel Exhaust
- Fuel Oil
- Lubricating Oil
- Plant Indoor Air

Aging Effects Requiring Management

The following lighting diesel generator aging effects require management:

- Cracking
- Hardening and loss of strength
- Loss of material
- Loss of preload

Aging Management Programs

The following aging management programs manage the aging effects for the lighting diesel generator component types:

- Bolting Integrity (B2.1.7)

- Buried Piping and Tanks Inspection (B2.1.18)
- Closed-Cycle Cooling Water System (B2.1.10)
- External Surfaces Monitoring Program (B2.1.20)
- Fuel Oil Chemistry (B2.1.14)
- Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B2.1.22)
- Lubricating Oil Analysis (B2.1.23)
- One-Time Inspection (B2.1.16)
- Selective Leaching of Materials (B2.1.17)

Table 3.3.2-28 Auxiliary Systems – Summary of Aging Management Evaluation – Lighting Diesel Generator System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG 1801 Vol 2 Item	Table 1 Item	Notes
Closure Bolting	PB	Carbon Steel	Atmosphere/ Weather (Ext)	Loss of preload	Bolting Integrity (B2.1.7)	None	None	H, 1
Closure Bolting	PB	Carbon Steel	Atmosphere/ Weather (Ext)	Loss of material	Bolting Integrity (B2.1.7)	VII.I-1	3.3.1.43	B
Closure Bolting	PB	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	Bolting Integrity (B2.1.7)	VII.I-4	3.3.1.43	B
Closure Bolting	PB	Carbon Steel	Plant Indoor Air (Ext)	Loss of preload	Bolting Integrity (B2.1.7)	VII.I-5	3.3.1.45	B
Flame Arrestor	PB	Carbon Steel	Fuel Oil (Int)	Loss of material	Fuel Oil Chemistry (B2.1.14) and One-Time Inspection (B2.1.16)	VII.H1-10	3.3.1.20	B
Flame Arrestor	PB	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.I-8	3.3.1.58	B
Flexible Hoses	PB	Elastomer	Lubricating Oil (Int)	None	None	None	None	G, 2
Flexible Hoses	PB	Elastomer	Plant Indoor Air (Ext)	Hardening and loss of strength	External Surfaces Monitoring Program (B2.1.20)	VII.F1-7	3.3.1.11	E
Piping	PB	Carbon Steel	Atmosphere/ Weather (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.H1-8	3.3.1.60	B
Piping	PB	Carbon Steel	Buried (Ext)	Loss of material	Buried Piping and Tanks Inspection (B2.1.18)	VII.H1-9	3.3.1.19	B
Piping	PB	Carbon Steel	Diesel Exhaust (Int)	Loss of material	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B2.1.22)	VII.H2-2	3.3.1.18	E

Table 3.3.2-28 Auxiliary Systems – Summary of Aging Management Evaluation – Lighting Diesel Generator System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG 1801 Vol 2 Item	Table 1 Item	Notes
Piping	PB	Carbon Steel	Fuel Oil (Int)	Loss of material	Fuel Oil Chemistry (B2.1.14) and One-Time Inspection (B2.1.16)	VII.H1-10	3.3.1.20	B
Piping	PB	Carbon Steel	Lubricating Oil (Int)	Loss of material	Lubricating Oil Analysis (B2.1.23) and One-Time Inspection (B2.1.16)	VII.H2-20	3.3.1.14	B
Piping	PB	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.I-8	3.3.1.58	B
Piping	PB	Stainless Steel	Diesel Exhaust (Int)	Cracking	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B2.1.22)	VII.H2-1	3.3.1.06	E
Piping	PB	Stainless Steel	Diesel Exhaust (Int)	Loss of material	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B2.1.22)	VII.H2-2	3.3.1.18	E
Piping	PB	Stainless Steel	Plant Indoor Air (Ext)	None	None	VII.J-15	3.3.1.94	A
Silencer	PB	Carbon Steel	Atmosphere/ Weather (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.I-9	3.3.1.58	B
Silencer	PB	Carbon Steel	Diesel Exhaust (Int)	Loss of material	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B2.1.22)	VII.H2-2	3.3.1.18	E

Table 3.3.2-28 Auxiliary Systems – Summary of Aging Management Evaluation – Lighting Diesel Generator System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG 1801 Vol 2 Item	Table 1 Item	Notes
Tank	PB	Carbon Steel	Fuel Oil (Int)	Loss of material	Fuel Oil Chemistry (B2.1.14) and One-Time Inspection (B2.1.16)	VII.H1-10	3.3.1.20	B
Tank	PB	Carbon Steel	Lubricating Oil (Int)	Loss of material	Lubricating Oil Analysis (B2.1.23) and One-Time Inspection (B2.1.16)	VII.H2-20	3.3.1.14	B
Tank	PB	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.I-8	3.3.1.58	B
Tank	PB	Carbon Steel	Plant Indoor Air (Int)	Loss of material	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B2.1.22)	VII.H2-21	3.3.1.71	B
Tubing	PB	Stainless Steel	Fuel Oil (Int)	Loss of material	Fuel Oil Chemistry (B2.1.14) and One-Time Inspection (B2.1.16)	VII.H2-16	3.3.1.32	B
Tubing	PB	Stainless Steel	Plant Indoor Air (Ext)	None	None	VII.J-15	3.3.1.94	A
Valve	PB	Carbon Steel	Fuel Oil (Int)	Loss of material	Fuel Oil Chemistry (B2.1.14) and One-Time Inspection (B2.1.16)	VII.H1-10	3.3.1.20	B
Valve	PB	Carbon Steel	Lubricating Oil (Int)	Loss of material	Lubricating Oil Analysis (B2.1.23) and One-Time Inspection (B2.1.16)	VII.H2-20	3.3.1.14	B
Valve	PB	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.I-8	3.3.1.58	B

Table 3.3.2-28 Auxiliary Systems – Summary of Aging Management Evaluation – Lighting Diesel Generator System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG 1801 Vol 2 Item	Table 1 Item	Notes
Valve	PB	Carbon Steel	Plant Indoor Air (Int)	Loss of material	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B2.1.22)	VII.H2-21	3.3.1.71	B
Valve	PB	Copper Alloy (> 15% Zinc)	Closed Cycle Cooling Water (Int)	Loss of material	Closed-Cycle Cooling Water System (B2.1.10)	VII.F1-15	3.3.1.51	B
Valve	PB	Copper Alloy (> 15% Zinc)	Closed Cycle Cooling Water (Int)	Loss of material	Selective Leaching of Materials (B2.1.17)	VII.H1-4	3.3.1.84	B
Valve	PB	Copper Alloy (> 15% Zinc)	Lubricating Oil (Int)	Loss of material	Lubricating Oil Analysis (B2.1.23) and One-Time Inspection (B2.1.16)	VII.H2-10	3.3.1.26	B
Valve	PB	Copper Alloy (> 15% Zinc)	Plant Indoor Air (Ext)	None	None	VIII.I-2	3.4.1.41	A

Notes for Table 3.3.2-28

Standard Notes

A Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.

B Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.

E Consistent with NUREG-1801 for material, environment, and aging effect, but a different aging management program is credited or NUREG-1801 identifies a plant-specific aging management program.

G Environment not in NUREG-1801 for this component and material.

H Aging effect not in NUREG-1801 for this component, material and environment combination.

Plant Specific Notes

1 Loss of Preload is conservatively considered to be applicable for all closure bolting.

2 This non NUREG-1801 line item was created because there is no line item for a component made of elastomer with a lubricating oil internal environment.

3.5.2.1.6 Miscellaneous Yard Areas and Buildings (In Scope)

Materials

The materials of construction for the miscellaneous yard areas and buildings component types are:

- Aluminum
- Carbon Steel
- Concrete
- Concrete Block (Masonry Walls)
- Elastomer
- Gypsum/Plaster

Environment

The miscellaneous yard areas and buildings component types are exposed to the following environments:

- Atmosphere/ Weather (Structural)
- Buried (Structural)
- Encased in Concrete
- Plant Indoor Air (Structural)

Aging Effects Requiring Management

The following miscellaneous yard areas and buildings aging effects require management:

- Concrete cracking and spalling
- Cracking
- Cracking due to expansion
- Cracking, loss of bond, and loss of material (spalling, scaling)
- Cracks and distortion
- Increase in porosity and permeability, cracking, loss of material (spalling, scaling)
- Increased hardness, shrinkage and loss of strength
- Loss of material
- Loss of material (spalling, scaling) and cracking
- Loss of sealing

Aging Management Programs

The following aging management programs manage the aging effects for the miscellaneous yard areas and buildings component types:

- Fire Protection (B2.1.12)
- Masonry Wall Program (B2.1.31)
- Structures Monitoring Program (B2.1.32)

Table 3.5.2-6 Containments, Structures, and Component Supports – Summary of Aging Management Evaluation – Miscellaneous Yard Areas and Buildings

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Caulking and Sealant	FLB, SH	Elastomer	Atmosphere/ Weather (Structural) (Ext)	Loss of sealing	Structures Monitoring Program (B2.1.32)	III.A6-12	3.5.1.44	A
Caulking and Sealant	FLB, SH	Elastomer	Plant Indoor Air (Structural) (Ext)	Loss of sealing	Structures Monitoring Program (B2.1.32)	III.A6-12	3.5.1.44	A
Compressible Joints and Seals	SH	Elastomer	Plant Indoor Air (Structural) (Ext)	Loss of sealing	Structures Monitoring Program (B2.1.32)	III.A6-12	3.5.1.44	A
Concrete Block (Masonry Walls)	SH, SS	Concrete Block (Masonry Walls)	Atmosphere/ Weather (Structural) (Ext)	Cracking	Masonry Wall Program (B2.1.31)	III.A3-11	3.5.1.43	A
Concrete Block (Masonry Walls)	SH, SS	Concrete Block (Masonry Walls)	Plant Indoor Air (Structural) (Ext)	Cracking	Masonry Wall Program (B2.1.31)	III.A3-11	3.5.1.43	A
Concrete Elements	FB, MB, SH, SS	Concrete	Atmosphere/ Weather (Structural) (Ext)	Cracking due to expansion	Structures Monitoring Program (B2.1.32)	III.A3-2	3.5.1.27	A

A1.14 FUEL OIL CHEMISTRY

The Fuel Oil Chemistry program manages loss of material on the internal surface of components in the standby diesel generator (SDG) fuel oil storage and transfer system, diesel fire pump fuel oil system, lighting diesel generator system, and balance of plant (BOP) fuel oil system. The program includes (a) surveillance and monitoring procedures for maintaining fuel oil quality by controlling contaminants in accordance with the Technical Specifications and applicable ASTM Standards, (b) periodic draining of water from fuel oil tanks, (c) visual inspection of internal surfaces during periodic draining and cleaning, (d) ultrasonic wall thickness measurement or pulsed eddy current wall thickness measurement of fuel oil tank bottoms during periodic draining and cleaning, and (e) inspections of new fuel oil before it is introduced into the fuel oil tanks.

The effectiveness of the program is verified under the One-Time Inspection program (A1.16).

B2.1.14 Fuel Oil Chemistry

Program Description

The Fuel Oil Chemistry program manages loss of material on the internal surface of components in the standby diesel generator (SDG) fuel oil storage and transfer system, diesel fire pump fuel oil system, lighting diesel generator system, and balance of plant (BOP) fuel oil system. The program includes (a) surveillance and monitoring procedures for maintaining fuel oil quality by controlling contaminants in accordance with the Technical Specifications and applicable ASTM Standards, (b) periodic draining of water from fuel oil tanks, (c) visual inspection of internal surfaces during periodic draining and cleaning, (d) ultrasonic wall thickness measurement or pulsed eddy current wall thickness measurement of fuel oil tank bottoms during periodic draining and cleaning, and (e) inspection of new fuel oil before it is introduced into the fuel oil tanks.

Fuel oil quality is maintained by monitoring and controlling fuel oil contaminants in accordance with the Technical Specifications and applicable ASTM Standards. This is accomplished by periodic sampling and chemical analysis of the fuel oil inventory at the plant, and sampling, testing, and analysis of new fuel oil prior to introduction into the fuel oil storage tanks. Initial samples of new fuel oil are inspected for water and entrained foreign material as precautions during the delivery process to avoid introducing contaminants. If a sample appears unsatisfactory, delivery is discontinued or not allowed.

The One-Time Inspection program (B2.1.16) is used to verify the effectiveness of the Fuel Oil Chemistry program.

NUREG-1801 Consistency

The Fuel Oil Chemistry program is an existing program that, following enhancement, will be consistent, with exception to NUREG-1801, Section XI.M30, Fuel Oil Chemistry.

Exceptions to NUREG-1801

Program Elements Affected:

Scope of Program (Element 1) and Acceptance Criteria (Element 6)

NUREG-1801 states that fuel oil quality is maintained in accordance with ASTM Standards D1796, D2276, D2709, D6217, and D4057; ASTM Standards D6217 and Modified D2276, Method A are used for guidance for determination of particulates. The modification to D2276 consists of using a filter with a pore size of 3.0 microns, instead of 0.8 micron. STP program specifies fuel oil particulate concentrations are measured using a 0.8 micron nominal pore size filter, in accordance with ASTM-D2276. STP Technical Specification 6.8.3.i.3 specifies using a test method based on ASTM-D2276 to assure total particulate concentration is < 10mg/l.

The basis for use of ASTM-D2276 instead of ASTM-D6217 is the following: ASTM-D2276 provides guidance on determining particulate contamination using a field monitor. It provides for rapid assessment of changes in contamination level without the time delay required for rigorous laboratory procedures. ASTM-D6217 provides guidance on determining particulate

contamination by sample filtration at an off-site laboratory. Neither method contains acceptance criteria or is more stringent than the other. ASTM-D2276 is an accepted method of determining particulates, a method recommended by ASTM-D975, and STP is committed by Technical Specification to follow its guidance.

Scope of Program (Element 1), Parameters Monitored or Inspected (Element 3), and Acceptance Criteria (Element 6)

NUREG-1801 states that ASTM-D2709 is used for guidance in determining water and sediment contamination in diesel fuel. STP uses only ASTM-D1796, not ASTM-D2709, for determining water and sediment contamination in diesel fuel. The testing conducted using ASTM-D1796 gives quantitative results, whereas ASTM-D2709 testing gives only pass-fail results. Therefore, the ASTM-D1796 method gives more descriptive information about the fuel oil condition than the ASTM-D2709 method.

NUREG-1801 states that ASTM-D4057 is used for guidance on oil sampling. This standard requires that multilevel sampling be performed for tanks the size of the SDG fuel oil storage tanks. The Fuel Oil Chemistry program is focused on managing the conditions that cause general, pitting, and microbiologically-influenced corrosion (MIC) of the diesel fuel tank internal surfaces. The fuel oil contaminants settle at the bottom of the tank and are removed along with the water that has settled on the bottom. The fuel oil contaminants settle to the bottom of the tank, so only the bottom is sampled for contaminant concentrations. The fuel oil in the other levels of the tank contains less contaminants per volume than the bottom, making sampling away from the bottom ineffective in managing fuel oil contaminants.

Parameters Monitored or Inspected (Element 3) and Acceptance Criteria (Element 6)

NUREG-1801 states that a filter with a pore size of 3.0 microns will be used in the determination of particulates. STP uses a filter with a pore size of 0.8 micron per ASTM-D2276. STP Technical Specifications provide for the use of ASTM-D2276 for the analysis of fuel oil. Using a smaller pore size is a more conservative inspection, since more contaminants will be captured when using a filter with a smaller pore size. Thus, a filter with a smaller pore size than 3.0 microns is acceptable in the inspection of fuel oil contaminant concentrations.

Enhancements

Prior to the period of extended operation, the following enhancements will be implemented in the following program elements:

Scope of Program (Element 1)

Procedures will be enhanced to extend the scope of the program to include the SDG fuel oil drain tanks.

Scope of Program (Element 1) and Preventive Actions (Element 2)

Procedures will be enhanced to check and remove the accumulated water from the fuel oil drain tanks, day tanks, and storage tanks associated with the SDG, BOP, lighting diesel generator, and fire water pump diesel generators. A minimum frequency of water removal from the fuel oil tanks will be included in the procedure.

Preventive Actions (Element 2), Parameters Monitored or Inspected (Element 3), and Detection of Aging Effects (Element 4)

Procedures will be enhanced to include 10-year periodic draining, cleaning, and inspection for corrosion of the SDG fuel oil drain tanks, lighting diesel generator fuel oil tank, and diesel fire pump fuel oil storage tanks.

Procedures will be enhanced to inspect the BOP diesel generator fuel oil day tanks and the lighting diesel generator fuel oil tank for internal corrosion.

Procedures will be enhanced to require periodic testing of the lighting diesel generator fuel oil tank and the SDG and diesel fire pump fuel oil storage tanks for microbiological organisms.

Parameters Monitored or Inspected (Element 3), Monitoring and Trending (Element 5), and Acceptance Criteria (Element 6)

Procedures will be enhanced to require analysis for water, biological activity, sediment, and particulate contamination of the diesel fire pump fuel oil storage tanks, lighting diesel generator fuel oil tank, and the BOP diesel generator fuel oil day tanks on a quarterly basis.

Detection of Aging Effects (Element 4)

Procedures will be enhanced to conduct ultrasonic testing or pulsed eddy current thickness examination to detect corrosion-related wall thinning once on the tank bottoms for the SDG and diesel fire pump fuel oil storage tanks, and the BOP diesel generator fuel oil day tanks.

Monitoring and Trending (Element 5)

Procedures will be enhanced to incorporate the sampling and testing of the diesel fire pump fuel oil storage tanks for particulate contamination and water and to incorporate the trending of water, particulate contamination, and microbiological activity in the SDG and diesel fire pump fuel oil storage tanks, lighting diesel generator fuel oil tank, and the BOP diesel generator fuel oil day tanks.

Operating Experience

STP work orders, condition reports, and the chemistry database from 1999 to 2009 related to fuel oil chemistry were reviewed. None were found which documented any type of corrosion. Several occurrences were found in the chemistry database which documented the need to add biocide to the fuel oil due to finding microbiological growth. Condition reports have documented that fuel oil chemistry was out of specification in the following instances:

Water and fine sediment intrusion in the auxiliary fuel oil storage tank, diesel generator fuel oil storage tank, fire pump fuel oil storage tank, and the vendor fuel oil trailer tanks have been found approximately annually due to various reasons including the tank cleaning work and a predisposition of a floating tank roof to allow water to pass through and into tank. Corrective actions for fuel oil tanks, including additional inspections and the draining from the bottom of tanks after allowing the water and sediment to settle, have been effective in bringing the fuel oil chemistry back into specification limits, as proven during inspection procedures.

As additional industry and plant-specific applicable operating experience becomes available, it will be evaluated and incorporated into the program through the Condition Reporting Process or the Operating Experience program.

Conclusion

The continued implementation of the Fuel Oil Chemistry program, supplemented by the One-Time Inspection program (B2.1.16), provides reasonable assurance that aging effects will be managed such that the systems and components within the scope of this program will continue to perform their intended functions consistent with the current licensing basis for the period of extended operation.

CHANGE

Revised Description of Metal Fatigue of Reactor Coolant System Pressure Boundary Program to Ensure that Actual Plant Experience Remains Boundary by Transients Assumed by "Fatigue Crack Growth Analysis" as well as in Design Calculations

A2 SUMMARY DESCRIPTIONS OF TIME-LIMITED AGING ANALYSIS AGING MANAGEMENT PROGRAMS

A2.1 METAL FATIGUE OF REACTOR COOLANT PRESSURE BOUNDARY

The Metal Fatigue of Reactor Coolant Pressure Boundary program manages fatigue cracking caused by anticipated cyclic strains in metal components of the reactor coolant pressure boundary. The program ensures that actual plant experience remains bounded by the transients assumed in the design calculations and fatigue crack growth analyses, or that appropriate corrective actions maintain the design and licensing basis by other acceptable means. The program tracks the number of transient cycles and cumulative fatigue usage at monitored locations. The program will also consider the effects of the reactor water environment for a set that includes the NUREG/CR-6260 sample locations for a newer-vintage Westinghouse Plant, and plant-specific bounding EAF locations. If a cycle count or cumulative usage factor value increases to a program action limit, corrective actions include fatigue reanalysis, repair, or replacement. Any re-analysis of a fatigue crack growth analysis will be consistent with or reconciled to the originally submitted analysis and will receive the same level of regulatory review as the original analysis. Action limits permit completion of corrective actions before the design basis number of events is exceeded.

CHANGE

UFSAR Change Notice 2997

Revised the total number of primary side hydrostatic test cycles to a limit of 1 for Unit 1 that is now limited by the BMI half nozzle repair..

Table 4.3-2 STP Units 1 and 2 Transient Cycle Count 60-year Projections

Transient Description	UFSAR Design Cycles	Program Limiting Value	Baseline Events Up to Year End 2008		Projected Events for 60-Years	
			Unit 1 (1988-2008)	Unit 2 (1989-2008)	Unit 1	Unit 2
37. Actuation of RCS Cold Over-pressurization Mitigation System (COMS)	10	10	3	1	4	2
38. Normal Charging Letdown Shutoff and Letdown Trip	NS	60	7	18	16	54
39. Letdown Trip with Prompt Return to Service	NS	200	3	3	10	10
40. Letdown Trip with Delayed Return to Service	NS	20	3	0	9	1
41. Charging Trip with Prompt Return to Service	NS	20	10	0	15	1
42. Charging Trip With Delayed Return to Service	NS	20	0	0	1	1
Test Conditions						
43. Primary Side Hydrostatic Test	~~10~~1	1	1	1	1	1
44. Secondary Side Hydrostatic Test (each generator)	10	10	1	1	1	1
Auxiliary Conditions - Accumulator Safety Injections						
45. Inadvertent RCS Depressurization with H HSI	NS	20	0	0	1	1
46. Inadvertent Accumulator Blowdown	NS	4	0	0	1	1
47. RHR Operation	NS	200	44	27	89	76
48. High Head Safety Injection	NS	30	1	0	3	1

CHANGE

CHANGE IS INCORE CAPSULE TESTING ORDER

A1.15 REACTOR VESSEL SURVEILLANCE

The Reactor Vessel Surveillance program manages loss of fracture toughness of the reactor vessel beltline material. The Reactor Vessel Surveillance program for STP is designed to ASTM E 185 and complies with 10 CFR 50 Appendix H. Actual reactor vessel coupons are used. The surveillance coupons are tested by a qualified offsite vendor, to its procedures. The testing program and reporting conform to the requirements of ASTM E 185-82.

The removal schedule of the surveillance coupons will yield data with exposures greater than that expected in 60 years of operation. This withdraw schedule therefore meets the ASTM E 185-82 criterion which states that capsules may be removed when the capsule neuron fluence is between one and two times the limiting fluence calculated for the vessel at the end of expected life.

Vessel fluence for both units will be determined by ex-vessel dosimetry after ~~all~~ the capsules with a fluence greater than 60 years have been removed.

B2.1.15 Reactor Vessel Surveillance

Program Description

The Reactor Vessel Surveillance program manages loss of fracture toughness of the reactor vessel beltline material. The Reactor Vessel Surveillance program is designed to ASTM E 185 and complies with 10 CFR 50 Appendix H. Actual reactor vessel coupons are used, but an exemption in the original license permits use of other than beltline weld material for the weld coupons. The surveillance coupons are tested by a qualified offsite vendor, to its procedures. The testing program and reporting conform to the requirements of ASTM E 185-82.

The results are used to project the end-of-life fluence, and demonstrate compliance with Charpy upper-shelf energy requirements in 10 CFR 50 Appendix G and pressurized thermal shock screening criteria in 10 CFR 50.61, using the methodologies in Regulatory Guide 1.99 Revision 2. The results are also used to verify the plants' operating restrictions implemented through the P-T curves.

For both Units, ~~The~~ the removal schedule, approved by the NRC, ~~will~~ exposes ~~the remaining~~ capsules to a fluence greater than that expected at the beltline wall at 60 years. This withdrawal therefore meets the ASTM E 185-82 criterion which states that capsules may be removed when the capsule neutron fluence is between one and two times the limiting fluence calculated for the vessel at the end of expected life. The remaining untested capsules will remain in the vessel to experience higher fluences in support of industry initiatives ~~will also be withdrawn at this time and stored in the spent fuel pool as spares~~. Vessel fluence will be determined by ex-vessel dosimetry once ~~all~~ the capsules with a fluence greater than 60 years are removed.

NUREG-1801 Consistency

The Reactor Vessel Surveillance program is an existing program that, following enhancement, will be consistent to NUREG-1801, Section XI.M31, Reactor Vessel Surveillance.

Exceptions to NUREG-1801

None

Enhancements

Prior to the period of extended operation, the following enhancements will be implemented in the following NUREG-1801 "items":

NUREG-1801 Item 7

NUREG-1801 states "Applicants without in-vessel capsules use alternative dosimetry to monitor neutron fluence during the period of extended operation, as part of the aging management program for reactor vessel neutron embrittlement."

Procedures will be enhanced to include the withdrawal schedule and analysis of the ex-vessel dosimetry chain.

NUREG-1801 Item 8

NUREG-1801 suggests that "The applicant may choose to demonstrate that the materials in the inlet, outlet, and safety injection nozzles [extended beltline materials] are not controlling, so that such materials need not be added to the material surveillance program for the license renewal term."

STP will demonstrate that the reactor vessel inlet and out nozzles are exposed to a fluence of less than 10^{17} n/cm^2, or will incorporate the adjusted reference temperature (ART) for the inlet and outlet nozzles with bounding chemistry and fluence values into the P-T limit curves.

The program will be enhanced to include the Unit 2 bottom head torus in the Reactor Vessel Surveillance program. This involves including the Unit 2 bottom head torus in the evaluations for P-T limit curves and compliance with the PTS rule. The program will address the surveillance coupon materials in one of the following manners: (1) add coupon material from the Unit 2, bottom head torus, if available; or (2) use data from similar material at another plant, if available. (3) If inclusion of material from the Unit 2 the bottom head torus in the surveillance program is not practical or if data from another plant is not available, Regulatory Guide 1.99 provides methods that can be used, with increased margins to account for uncertainties.

Operating Experience

The latest capsule to be withdrawn from STP Unit 1 was Capsule V in 2007 at 11.13 EFPY with a capsule equivalent age of 34 EFPY. The latest capsule to be withdrawn from STP Unit 2 was Capsule U in 2007 at 10.31 EFPY with a capsule equivalent age of 33 EFPY. The last-tested capsule specimens satisfy the upper-shelf energy criterion and pressurized thermal shock temperature screening criteria. The adjusted reference temperatures have been shown to be less than that used in the P-T limit curves, thereby demonstrating margin in the operating limits.

The current withdrawal schedule calls for the last capsules in each unit to be withdrawn at approximately 18 EFPY, which is equivalent to a vessel exposure of approximately 59 EFPY. This EOLE exposure is greater than the anticipated 54 EFPY end of life fluence.

Conclusion

The continued implementation of the Reactor Vessel Surveillance program provides reasonable assurance that aging effects will be managed such that the systems and components within the scope of this program will continue to perform their intended functions consistent with the current licensing basis for the period of extended operation.

B2.1.17 Selective Leaching of Materials

Program Description

The Selective Leaching of Materials program manages the loss of material due to selective leaching for copper alloys with greater than 15 percent zinc and gray cast iron components exposed to treated water, raw water, and groundwater (buried) within the scope of license renewal.

The Selective Leaching of Materials program is a new program which includes a one-time inspection of a sample of components made from gray cast iron and copper alloys with greater than 15 percent zinc. Sample selection criteria will focus on bounding or lead components most susceptible to aging due to time in service, severity of operating conditions, and lowest design margin. The program procedure provides for visual and mechanical inspections for each system/material/environment combination and for follow-up engineering evaluation in the event that graphitization of gray cast iron or dezincification of copper alloys with greater than 15 percent zinc components is detected. Sample sizes for selective leaching are based on 20 percent of the material/environment group population to a maximum of 25 components. If buried gray cast iron valves are removed from the fire protection system, then at least one of them will be evaluated to determine the extent of selective leaching of the valve. The plant-specific Selective Leaching of Aluminum Bronze program (B2.1.37) covers aluminum bronze components. Inspection of buried components subject to selective leaching is covered in Buried Piping and Tanks Inspection (B2.1.18).

The Selective Leaching of Materials program will be implemented during the 10 years prior to the period of extended operation.

NUREG-1801 Consistency

The Selective Leaching of Materials program is a new program that, when implemented, will be consistent, with exception to NUREG-1801, Section XI.M33, Selective Leaching of Materials.

Exceptions to NUREG-1801

Program Elements Affected:

Scope of Program (Element 1)

NUREG-1801, Section XI.M33 states that the Selective Leaching of Materials program should include bronze or aluminum bronze components that may be exposed to a raw water, treated water, or groundwater environment. Aluminum bronze is not managed by the Selective Leaching of Materials program. STP currently has a plant specific Selective Leaching of Aluminum Bronze program (B2.1.37), which covers these aluminum bronze components.

Scope of Program (Element 1), Parameters Monitored or Inspected (Element 3), and Detection of Aging Effects (Element 4)

NUREG-1801, Section XI.M33 recommends hardness testing of sample components in addition to visual inspections. However, a qualitative determination of selective leaching is used in lieu of Brinell hardness testing for components within the scope of the STP Selective Leaching of

Materials program. The exception involves the use of examinations, other than Brinell hardness testing, identified in NUREG-1801 to identify the presence of selective leaching of materials. The exception is justified; because (1) hardness testing may not be feasible for most components due to form and configuration and (2) other mechanical means (e.g., scraping, or chipping) provide an equally valid means of identification.

Additionally, hardness testing only provides definitive results if baseline values are available for comparison purposes. Specific material contents for copper alloys may not be known and gray cast irons may not have published hardness numbers. Without specific numbers for comparison, hardness testing would yield unusable results. In lieu of hardness testing, visual and mechanical inspections will be performed on a sampling of components constructed of copper alloys with greater than 15 percent zinc and gray cast iron from various station system environments. Follow-up examinations or evaluations are performed on component material samples where indications of dezincification, de-alloying, or graphitization are visually detected and additional analysis, as part of the engineering evaluation, is required. The engineering evaluation may require confirmation with a metallurgical evaluation (which may include a microstructure examination).

NUREG 1801, Section XI.M33 requires visual inspection and hardness measurement of materials susceptible to selective leaching. This is consistent with the strategy in the Buried Piping and Tanks Inspection program (B2.1.18) for managing loss of material in buried fire protection piping.

Enhancements

None

Operating Experience

To date, there have been no reported cases of loss of material attributable to graphitization or dezincification.

Through-wall cracks have been identified in essential cooling water system piping initiated by pre-existing weld defects and propagated by a de-alloying phenomenon. The flaws evaluated appeared in welds with backing rings. STP has analyzed the effects of the cracking and found that the degradation is slow so that rapid or catastrophic failure is not a consideration and determined that the leakage can be detected before the flaw reaches a limiting size that would affect the intended function of the essential cooling water system. A monitoring and inspection program provides confidence in the ability to detect the leakage. In order to identify and evaluate future leaks, the accessible large bore piping welds with backing rings are visually inspected every six months for evidence of leakage. A walk down of the yard above buried essential cooling water system pipe is performed every six months for evidence of soil changes that may indicate pressure boundary leakage. The most susceptible components are cast aluminum bronze fittings (flanges and tees) with backing ring welds. A special VT-2 visual examination of the system is performed every six months to identify new de-alloying locations. An operability review and an NRC relief request are performed for all through-wall leaks in piping larger than one-inch in diameter. The long-term strategy for essential cooling water system piping de-alloying is to replace fittings when through-wall de-alloying is discovered. This strategy is acceptable based on the very slow degradation mechanism coupled with the preservation of structural integrity and is consistent with the EPRI Service Water Piping

Guideline. These ongoing activities are detailed in the Selective Leaching of Aluminum Bronze program (B2.1.37) and are examples of where selective leaching was detected and plant procedures and inspection activities were implemented to ensure that the intended functions of the essential cooling water system are maintained.

As additional industry and plant-specific applicable operating experience becomes available, it will be evaluated and incorporated into the program through the STP condition reporting and operating experience programs.

Conclusion

The implementation of the Selective Leaching of Materials program will provide reasonable assurance that aging effects will be managed such that the systems and components within the scope of this program will continue to perform their intended functions consistent with the current licensing basis for the period of extended operation.

CHANGE

UFSAR Change Notice 3005

Revised the survey frequency of the Essential Cooling Water Pond sediment from year 5 years to every 10 years

A1.33 RG 1.127, INSPECTION OF WATER-CONTROL STRUCTURES ASSOCIATED WITH NUCLEAR POWER PLANTS

The RG 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants program manages cracking, loss of bond, loss of material (spalling, scaling), cracking due to expansion, increase in porosity and permeability, loss of strength, and loss of form by performing inspection and surveillance activities for all water control structures associated with emergency cooling water systems. The RG 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants program is implemented as part of the Structures Monitoring Program. STP is committed to conform to the intent of RG 1.127 with respect to the essential cooling pond (ultimate heat sink). The Structures Monitoring Program includes all water control structures within the scope of RG 1.127, as evaluated in NUREG-1801. The essential cooling pond, the essential cooling pond intake structure, and the essential cooling pond discharge structure are the water-control structures within the scope of license renewal that are monitored by this program. The essential cooling pond (ultimate heat sink) receives periodic monitoring of its hydraulic and structural condition, which includes evaluation of erosion inhibiting structures, conditions of benchmarks and piezometers, ~~and~~ measuring the essential cooling pond volume as indicative of any sediment accumulation, and~~. Additionally, STP performs a~~ seepage rate evaluation. Inspections of ~~for~~ the essential cooling pond are performed every five years except sediment monitoring, which is performed every ten years.

B2.1.33 RG 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants

Program Description

The RG 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants program, which is implemented as part of the Structures Monitoring Program (SMP), manages cracking, loss of bond, loss of material (spalling, scaling), cracking due to expansion, increase in porosity and permeability, loss of strength, and loss of form by performing inspection and surveillance activities for all water control structures associated with emergency cooling water systems. STP is committed to conform to the intent of RG 1.127 with respect to the essential cooling pond (ultimate heat sink). The Structures Monitoring Program (B2.1.32) in compliance with 10 CFR 50.65, *The Maintenance Rule*, includes all water control structures within the scope of RG 1.127, as evaluated in NUREG-1801. The essential cooling pond, the essential cooling pond intake structure, and the essential cooling pond discharge structure are the water-control structures within the scope of license renewal that are monitored by this program. The essential cooling pond (ultimate heat sink) receives periodic monitoring of its hydraulic and structural condition, which includes evaluation of erosion inhibiting structures, conditions of benchmarks and piezometers, ~~and~~ measuring the essential cooling pond volume as indicative of any sediment accumulation, and~~. Additionally, STP performs a~~ seepage rate evaluation. Inspections of ~~for~~ the essential cooling pond are performed every five years except sediment monitoring, which is performed every ten years.

NUREG-1801 Consistency

The RG 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants program, is an existing program that, following enhancement, will be consistent with NUREG-1801, Section XI.S7, RG 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants.

Exceptions to NUREG-1801

~~None~~ Program Elements Affected:

Detection of Aging Effects (Element 4)

NUREG-1801 cites Regulatory Guide 1.127 for describing periodic inspections to be performed at least once every five years. STP has extended the frequency interval for sediment monitoring of the Essential Cooling Pond (ECP) to every 10 years. (Ref. Licensing Basis Document Change Request CN-3005) The makeup to the ECP is either through the well water system or from the Main Cooling Reservoir. Each source of makeup is relativity free of sediment. There are no external sources draining into the pond to promote sediment buildup, and it is isolated from the external sources by the outer embankment which completely surrounds the pond. Sediment level was measured by soundings performed every year from 1987 to 1997, with subsequent surveys performed in 2002 and 2009. There has been no measureable accumulation of sediment. Therefore, extending the frequency interval for sediment surveys from every 5 years to every 10 years will have no affect on the ECP design to

perform its intended function of supplying water for a minimum of 30 days of heat removal without outside makeup.

Enhancements

Prior to the period of extended operation, the following enhancements will be implemented in the following program elements:

Preventive Actions (Element 2)

For ASTM A325, ASTM F1852, and/or ASTM A490 structural bolts, plant procedures will be revised to specify the preventive actions for storage, protection and lubricants recommended in Section 2 of Research Council for Structural Connections publication "Specification for Structural Joints Using ASTM A325 or A490 Bolts."

Detection of Aging Effects (Element 4)

Procedures will be enhanced to specify inspections at intervals not to exceed five years or to immediately follow significant natural phenomena except sediment monitoring, which is performed every ten years.

Procedures will be enhanced to specify ACI 349.3R-96 and ACI 201.1R-68 as the basis for defining quantitative acceptance criteria.

Operating Experience

A review of the structures monitoring inspection documents shows that the water control structures at STP including the essential cooling pond, ECW intake and ECW discharge structures have been subject to relatively few aging effects. These inspections include scheduled structures monitoring inspections and detailed visual inspections of the essential cooling pond. All structures have always been in acceptable condition and met engineering functional requirements including performance, maintainability, and safety.

Essential cooling pond inspection report from 1997 states measurements of pond volume over the years have indicated virtually no accumulation of sediments within the pond. The differential settlements of the ECW intake structure and ECW discharge structure were well within the allowable limit of ¾ in. The deflections measured along buried ECW pipe routes using benchmark elevations were found to be well within allowable of 1.5 in. All of the essential cooling pond benchmarks and piezometers were found to be fully functional and measurements were being taken as specified in the UFSAR. There was an array of shrinkage cracks running longitudinal along the soil-cement and concrete paved exterior slopes of embankments, however, this was attributed due to the fluctuating moisture contents of the soil within and as such did not exhibit any signs of erosion

Two minor potential consequences of growing vegetation around the essential cooling pond slopes have been identified. The potential for cracking of areas with soil-cement and concrete leading to soil erosion and the issue of clogging (owing to soil and vegetation) possibly leading to entrapping of debris near the trash racks of the ECWIS was identified. These conditions are non-aging related and could easily be fixed by regular herbicide application.

Conclusion

The continued implementation of the RG 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants program provides reasonable assurance that aging effects will be managed such that the systems and components within the scope of this program will continue to perform their intended functions consistent with the current licensing basis for the period of extended operation.

CHANGE

UFSAR Change Notice 3006

Revised the Allowable Material that can be used in the Reactor Coolant Pump Closure Bolting

3.1.2.1.2 Reactor Coolant System

Materials

The materials of construction for the reactor coolant system component types are:

- Carbon Steel
- Insulation Calcium Silicate
- Insulation Fiberglass
- Nickel Alloy
- Stainless Steel
- Stainless Steel Cast Austenitic

Table 3.1.2-2 Reactor Vessel, Internals, and Reactor Coolant System – Summary of Aging Management Evaluation – Reactor Coolant System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Closure Bolting	PB	Carbon Steel	Borated Water Leakage (Ext)	Cumulative fatigue damage	Time-Limited Aging Analysis evaluated for the period of extended operation	IV.C2-10	3.1.1.07	A
Closure Bolting	PB	Nickel Alloy	Borated Water Leakage (Ext)	Cracking	Bolting Integrity (B2.1.7)	None	None	F, 4
Closure Bolting	PB	Nickel Alloy	Borated Water Leakage (Ext)	Loss of preload	Bolting Integrity (B2.1.7)	None	None	F, 5
Closure Bolting	PB	Stainless Steel	Borated Water Leakage (Ext)	Cracking	Bolting Integrity (B2.1.7)	IV.C2-7	3.1.1.52	B
Closure Bolting	PB	Stainless Steel	Borated Water Leakage (Ext)	Loss of preload	Bolting Integrity (B2.1.7)	IV.C2-8	3.1.1.52	B
Closure Bolting	PB	Stainless Steel	Borated Water Leakage (Ext)	Cumulative fatigue damage	Time-Limited Aging Analysis evaluated for the period of extended operation	IV.C2-10	3.1.1.07	A
Flame Arrestor	PB	Carbon Steel	Lubricating Oil (Int)	Loss of material	Lubricating Oil Analysis (B2.1.33) and One-Time Inspection (B2.1.16)	VII.G-26	3.3.1.15	D,3
Flame Arrestor	PB	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	V.C-1	3.2.1.31	D,3
Flow Element	LBS	Stainless Steel	Borated Water Leakage (Ext)	None	None	IV.E-3	3.1.1.86	A
Flow Element	LBS	Stainless Steel	Treated Borated Water (Int)	Loss of material	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.16)	V.D1-30	3.2.1.49	E, 2

Notes for Table 3.1.2-1:

Standard Notes:

A Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
B Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
C Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
E Consistent with NUREG-1801 for material, environment, and aging effect, but a different aging management program is credited or NUREG-1801 identifies a plant-specific aging management program.
F Material not in NUREG-1801 for this component.
G Environment not in NUREG-1801 for this component and material.
I Aging effect in NUREG-1801 for this component, material and environment combination is not applicable.

Plant Specific Notes:

1 Water Chemistry (B2.1.2) and ASME Section XI, Inservice Inspection, Subsections IWB, IWC, and IWD (B2.1.1) are used to manage this aging effect for Cast Austenitic Stainless Steel (CASS) components.

2 The Water Chemistry program (B2.1.2) and the One-Time Inspection program (B2.1.16) manage loss of material due to pitting and crevice corrosion and cracking due to stress corrosion cracking. The One-Time Inspection program (B2.1.16) includes selected components at susceptible locations.

3 Component is part of RCP oil collection system.

4 This non NUREG-1801 line item was created because there is no line item for a component made of nickel alloy with borated water leakage (Ext) with an aging effect of cracking/ stress corrosion cracking.

5 Loss of Preload is conservatively considered to be applicable for all closure bolting.

CHANGE

SOLENOID VALVES WERE ADDED TO THE SCOPE OF THE LRA FOR VARIOUS SYSTEMS

Table 2.3.3-6 Component Cooling Water System

Component Type	Intended Function
Sight Gauge	Leakage Boundary (spatial) Pressure Boundary Structural Integrity (attached)
Solenoid Valve	Pressure Boundary
Tank	Leakage Boundary (spatial) Pressure Boundary Structural Integrity (attached)

Table 2.3.4-6 Auxiliary Feedwater System

Component Type	Intended Function
Pump	Pressure Boundary
Solenoid Valve	Pressure Boundary
Tank	Pressure Boundary

3.4.2.1.6 Auxiliary Feedwater System

Materials

The materials of construction for the auxiliary feedwater system component types are:

- Aluminum
- Carbon Steel
- Copper Alloy (>15% Zinc)
- Stainless Steel
- Stainless Steel Cast Austenitic

Environment

The auxiliary feedwater system components are exposed to the following environments:

- Atmosphere/ Weather
- Buried
- Dry Gas
- Encased in Concrete
- Lubricating Oil
- Plant Indoor Air
- Secondary Water
- Steam

Aging Effects Requiring Management

The following auxiliary feedwater system aging effects require management:

- Loss of material
- Loss of preload
- Reduction of heat transfer
- Wall Thinning

Aging Management Programs

The following aging management programs manage the aging effects for the auxiliary feedwater system component types:

- Flow Accelerated Corrosion (B2.1.6)
- Bolting Integrity (B2.1.7)

- Buried Piping and Tanks Inspection (B2.1.18)
- External Surfaces Monitoring Program (B2.1.20)
- Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B2.1.22)
- Lubricating Oil Analysis (B2.1.23)
- One-Time Inspection (B2.1.16)
- Selective Leaching of Materials (B2.1.17)
- Water Chemistry (B2.1.2)

Table 3.4.2-6 Steam and Power Conversion System – Summary of Aging Management Evaluation – Auxiliary Feedwater System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Piping	LBS, PB, SIA	Stainless Steel	Atmosphere/ Weather (Ext)	None	None	None	None	G
Piping	SIA	Stainless Steel	Atmosphere/ Weather (Int)	None	None	None	None	G, ~~3~~ 4
Piping	PB, SIA	Stainless Steel	Buried (Ext)	Loss of material	Buried Piping and Tanks Inspection (B2.1.18)	VIII.G-31	3.4.1.17	E
Pump	PB	Stainless Steel Cast Austenitic	Secondary Water (Int)	Loss of material	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.16)	VIII.G-32	3.4.1.16	A
Solenoid Valve	PB	Copper Alloy (>15% Zinc)	Plant Indoor Air (Int)	Loss of material	Selective Leaching of Materials (B2.1.17)	None	None	G, 2
Solenoid Valve	PB	Copper Alloy (>15% Zinc)	Plant Indoor Air (Ext)	None	None	V.F-3	3.2.1.53	A
Tank	PB	Stainless Steel	Atmosphere/ Weather (Ext)	None	None	None	None	G
Turbine	PB	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VIII.H-7	3.4.1.28	B
Turbine	PB	Carbon Steel	Steam (Int)	Loss of material	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.16)	VIII.B1-8	3.4.1.37	E, ~~2~~ 3
Valve	PB	Carbon Steel	Lubricating Oil (Int)	Loss of material	Lubricating Oil Analysis (B2.1.23) and One-Time Inspection (B2.1.16)	VIII.G-35	3.4.1.07	B

Plant Specific Notes:

1 Loss of preload is conservatively considered to be applicable for all closure bolting.

2 Non-inhibited copper alloy >15% zinc SSCs with surfaces exposed to ventilation atmosphere (internal) or plant indoor air (internal) are subject to wetting due to condensation and thus are subject to loss of material due to selective leaching.

~~2~~3 The Water Chemistry program (B2.1.2) and the One-Time Inspection program (B2.1.16) manage loss of material due to pitting and crevice corrosion and cracking due to stress corrosion cracking. The One-Time Inspection program (B2.1.16) includes selected components at susceptible locations.

~~3~~4 These items are assigned the environment of Atmosphere/ Weather (Internal). The items are vented or open to the outside atmosphere so the distinction between internal and external is not relevant for aging purposes. These stainless steel components are located outside with an uncontrolled external air environment and are not exposed to aggressive chemical species. The STP plant outdoor environment is not subject to industry air pollution or saline environment. Alternate wetting and drying has shown a tendency to "wash" the surface material rather than concentrate contaminants. Stainless steel does not experience any appreciable aging effects in this environment.

3.3.2.1.6 Component Cooling Water System

Materials

The materials of construction for the component cooling water system component types are:

- Carbon Steel
- Copper Alloy
- Copper Alloy (>15% Zinc)
- Glass
- Stainless Steel
- Titanium

Environment

The component cooling water system component types are exposed to the following environments:

- Closed-Cycle Cooling Water
- Demineralized Water
- Dry Gas
- Lubricating Oil
- Plant Indoor Air
- Raw Water
- Treated Borated Water

Aging Effects Requiring Management

The following component cooling water system aging effects require management:

- Cracking
- Loss of material
- Loss of preload
- Reduction of heat transfer

Aging Management Programs

The following aging management programs manage the aging effects for the component cooling water system component types:

- Bolting Integrity (B2.1.7)
- Closed-Cycle Cooling Water System (B2.1.10)

- External Surfaces Monitoring Program (B2.1.20)
- Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B2.1.22)
- Lubricating Oil Analysis (B2.1.23)
- One-Time Inspection (B2.1.16)
- Open-Cycle Cooling Water System (B2.1.9)
- Selective Leaching of Materials (B2.1.17)
- Water Chemistry (B2.1.2)

Table 3.3.2-6 Auxiliary Systems – Summary of Aging Management Evaluation – Component Cooling Water System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Sight Gauge	LBS, SIA	Glass	Plant Indoor Air (Ext)	None	None	VII.J-8	3.3.1.93	A
Solenoid Valve	PB	Copper Alloy (>15% Zinc)	Plant Indoor Air (Int)	Loss of material	Selective Leaching of Materials (B2.1.17)	None	None	G, 3
Solenoid Valve	PB	Copper Alloy (>15% Zinc)	Plant Indoor Air (Ext)	None	None	VIII.I-2	3.4.1.41	A
Tank	LBS, PB, SIA	Carbon Steel	Closed Cycle Cooling Water (Int)	Loss of material	Closed-Cycle Cooling Water System (B2.1.10)	VII.C2-14	3.3.1.47	B

Plant Specific Notes:

1 Loss of preload is conservatively considered to be applicable for all closure bolting.

2 The Water Chemistry program (B2.1.2) and the One-Time Inspection program (B2.1.16) manage loss of material due to pitting and crevice corrosion and cracking due to stress corrosion cracking. The One-Time Inspection program (B2.1.16) includes selected components at susceptible locations

3 Non-inhibited copper alloy >15% zinc SSCs with surfaces exposed to ventilation atmosphere (internal) or plant indoor air (internal) are subject to wetting due to condensation and thus are subject to loss of material due to selective leaching.

Table 2.3.3-19 Chemical and Volume Control System

Component Type	Intended Function
Strainer	Leakage Boundary (spatial)
Solenoid Valve	Pressure Boundary
Tank	Leakage Boundary (spatial) Pressure Boundary Structural Integrity (attached)

3.3.2.1.19 Chemical and Volume Control System

Materials

The materials of construction for the chemical and volume control system component types are:

- Aluminum
- Carbon Steel
- Cast Iron (Gray Cast Iron)
- Copper Alloy
- Copper Alloy (>15% Zinc)
- Insulation Calcium Silicate
- Insulation Fiberglass
- Nickel Alloys
- Stainless Steel
- Thermoplastics

Environment

The chemical and volume control system component types are exposed to the following environments:

- Borated Water Leakage
- Closed-Cycle Cooling Water
- Demineralized Water
- Dry Gas
- Lubricating Oil
- Plant Indoor Air
- Reactor Coolant
- Secondary Water
- Steam
- Treated Borated Water
- Zinc Acetate

Aging Effects Requiring Management

The following chemical and volume control system aging effects require management:

- Cracking

- Loss of material
- Loss of preload
- Reduction of heat transfer
- Wall thinning

Aging Management Programs

The following aging management programs manage the aging effects for the chemical and volume control system component types:

- ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B2.1.1)
- Bolting Integrity (B2.1.7)
- Closed-Cycle Cooling Water System (B2.1.10)
- External Surfaces Monitoring Program (B2.1.20)
- Flow-Accelerated Corrosion (B2.1.6)
- Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B2.1.22)
- Lubricating Oil Analysis (B2.1.23)
- One-Time Inspection (B2.1.16)
- One-Time Inspection of ASME Code Class 1 Small-Bore Piping (B2.1.19)
- Selective Leaching of Materials (B2.1.17)
- Water Chemistry (B2.1.2)

Table 3.3.2-19 Auxiliary Systems – Summary of Aging Management Evaluation – Chemical and Volume Control System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Pump	LBS	Stainless Steel	Zinc Acetate (Int)	Loss of material	Water Chemistry (B2.1.2) and One-Time Inspection (B2.1.16)	None	None	G
Solenoid Valve	PB	Copper Alloy (>15% Zinc)	Plant Indoor Air (Ext)	Loss of material	Selective Leaching of Materials (B2.1.17)	None	None	G, 3
Solenoid Valve	PB	Copper Alloy (>15% Zinc)	Plant Indoor Air (Int)	None	None	V.F-3	3.2.1.53	A
Strainer	LBS	Copper Alloy	Closed Cycle Cooling Water (Int)	Loss of material	Closed-Cycle Cooling Water System (B2.1.10)	VII.E1-11	3.3.1.51	B

Plant Specific Notes:

1 NUREG-1801 does not address the aging effect of nickel-alloys in borated water leakage. Nickel-alloys subject to an air with borated water leakage environment are similar to stainless steel in a borated water leakage environment and do not experience aging effects due to borated water leakage.

2 The Water Chemistry program (B2.1.2) and the One-Time Inspection program (B2.1.16) manage loss of material due to pitting and crevice corrosion and cracking due to stress corrosion cracking. The One-Time Inspection program (B2.1.16) includes selected components at susceptible locations.

3 Non-inhibited copper alloy > 15% zinc SSCs with surfaces exposed to ventilation atmosphere (internal) or plant indoor air (internal) are subject to wetting due to condensation and thus are subject to loss of material due to selective leaching.

Table 2.3.4-2 Auxiliary Steam System and Boilers

Component Type	Intended Function
Piping	Leakage Boundary (spatial) Pressure Boundary Structural Integrity (attached)
Solenoid Valve	Pressure Boundary
Tubing	Leakage Boundary (spatial) Pressure Boundary Structural Integrity (attached)

3.4.2.1.2 Auxiliary Steam System and Boilers

Materials

The materials of construction for the auxiliary steam system and boilers component types are:

- Carbon Steel
- Copper Alloy (>15% Zinc)
- Stainless Steel

Environment

The auxiliary steam system and boilers components are exposed to the following environments:

- Plant Indoor Air
- Steam

Aging Effects Requiring Management

The following auxiliary steam system and boilers aging effects require management:

- Cracking
- Loss of material
- Loss of preload
- Wall thinning

Aging Management Programs

The following aging management programs manage the aging effects for the auxiliary steam system and boilers component types:

- Bolting Integrity (B2.1.7)
- External Surfaces Monitoring Program (B2.1.20)
- Flow-Accelerated Corrosion (B2.1.6)
- One-Time Inspection (B2.1.16)
- Selective Leaching of Materials (B2.1.17)
- Water Chemistry (B2.1.2)

Table 3.4.2-1 Steam and Power Conversion System – Summary of Aging Management Evaluation – Main Steam System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Solenoid Valve	PB	Aluminum	Lubricating Oil (Int)	Loss of material	Lubricating Oil Analysis (B2.1.23) and One-Time Inspection (B2.1.16)	None	None	G
Solenoid Valve	PB	Aluminum	Plant Indoor Air (Int)	None	None	V.F-2	3.2.1.50	A
Solenoid Valve	PB	Aluminum	Plant Indoor Air (Ext)	None	None	V.F-2	3.2.1.50	A

Table 3.4.2-2 Steam and Power Conversion System – Summary of Aging Management Evaluation – Auxiliary Steam System and Boilers

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Piping	LBS, PB, SIA	Carbon Steel	Steam (Int)	Wall thinning	Flow-Accelerated Corrosion (B2.1.6)	VIII.B1-9	3.4.1.29	B
Solenoid Valve	PB	Copper Alloy (>15% Zinc)	Plant Indoor Air (Int)	Loss of material	Selective Leaching of Materials(B2.1.17)	None	None	G, 2
Solenoid Valve	PB	Copper Alloy (>15% Zinc)	Plant Indoor Air (Ext)	None	None	VIII.I-2	3.4.1.41	A
Tubing	LBS, PB, SIA	Stainless Steel	Plant Indoor Air (Ext)	None	None	VIII.I-10	3.4.1.41	A

Notes for Table 3.4.2-2:

Standard Notes:

A Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
B Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
D Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
E Consistent with NUREG-1801 for material, environment, and aging effect, but a different aging management program is credited or NUREG-1801 identifies a plant-specific aging management program.
G Environment not in NUREG-1801 for this component and material.

Plant Specific Notes:

1 The Water Chemistry program (B2.1.2) and the One-Time Inspection program (B2.1.16) manages loss of material due to pitting and crevice corrosion and cracking due to stress corrosion cracking. The One-Time Inspection program (B2.1.16) includes selected components at susceptible locations.

2 Non-Inhibited copper alloy >15% zinc SSCs with surfaces exposed to ventilation atmosphere (internal) or plant indoor air (internal) are subject to wetting due to condensation and thus are subject to loss of material due to selective leaching.

EDITORIAL CHANGES TO THE LRA

Table 3.1.2-1 Reactor Vessel, Internals, and Reactor Coolant System – Summary of Aging Management Evaluation – Reactor Vessel and Internals (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
RV BMI Nozzle and Welds	PB	Nickel Alloys	Reactor Coolant (Int)	Loss of material	Water Chemistry (B2.1.2)	IV.A2-14	3.1.1.83	A
RV BMI Nozzle and Welds	PB	Nickel Alloys	Reactor Coolant (Int)	Cracking	Nickel-Alloy Aging Management (~~B2.1.37~~B2.1.34), ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B2.1.1) for Class 1 components, Water Chemistry (B2.1.2), and Comply with applicable NRC Orders and provide a commitment in the FSAR supplement to implement applicable (1) Bulletins and Generic Letters and (2) staff-accepted industry guidelines.	IV.A2-19	3.1.1.31	E, 1
RV BMI Nozzle and Welds	PB	Nickel Alloys	Reactor Coolant (Int)	Cumulative fatigue damage	Time-Limited Aging Analysis evaluated for the period of extended operation	IV.A2-21	3.1.1.09	A

Table 3.1.2-1 Reactor Vessel, Internals, and Reactor Coolant System – Summary of Aging Management Evaluation – Reactor Vessel and Internals (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
RV Closure Head Bolts	PB	High Strength Low Alloy Steel (Bolting)	Borated Water Leakage (Ext)	Loss of material	Boric Acid Corrosion (B2.1.4)	IV.A2-13	3.1.1.58	A
RV Core Support Lugs	SS	Nickel Alloys	Reactor Coolant (Ext)	Cracking	Nickel-Alloy Aging Management (~~B2.1.37~~B2.1.34), ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B2.1.1) for Class 1 components, Water Chemistry (B2.1.2), and Comply with applicable NRC Orders and provide a commitment in the FSAR supplement to implement applicable (1) Bulletins and Generic Letters and (2) staff-accepted industry guidelines.	IV.A2-12	3.1.1.31	E, 1
RV Core Support Lugs	SS	Nickel Alloys	Reactor Coolant (Ext)	Loss of material	Water Chemistry (B2.1.2)	IV.A2-14	3.1.1.83	C

Table 3.1.2-1 Reactor Vessel, Internals, and Reactor Coolant System – Summary of Aging Management Evaluation – Reactor Vessel and Internals (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
RV Nozzle Safe End Welds	PB	Nickel Alloys	Reactor Coolant (Int)	Loss of material	Water Chemistry (B2.1.2)	IV.A2-14	3.1.1.83	A
RV Nozzle Safe End Welds	PB	Nickel Alloys	Reactor Coolant (Int)	Cracking	Nickel-Alloy Aging Management (~~B2.1.37~~B2.1.34), ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B2.1.1) for Class 1 components, Water Chemistry (B2.1.2), and Comply with applicable NRC Orders and provide a commitment in the FSAR supplement to implement applicable (1) Bulletins and Generic Letters and (2) staff-accepted industry guidelines.	IV.A2-15	3.1.1.69	E, 1
RV Nozzle Safe End Welds	PB	Nickel Alloys	Reactor Coolant (Int)	Cumulative fatigue damage	Time-Limited Aging Analysis evaluated for the period of extended operation	IV.A2-21	3.1.1.09	A

Plant Specific Notes:

1 Includes the plant specific Nickel-Alloy Aging Management Program (~~B2.1.37~~B2.1.34) in addition to the programs identified in NUREG-1801.

B2.1.13 Fire Water System

Program Description

The Fire Water System program manages loss of material for water-based fire protection systems consisting of piping, fittings, valves, sprinklers, nozzles, hydrants, hose stations, standpipes and water storage tanks. Periodic hydrant inspections, fire main flushing, sprinkler inspections, and flow tests in accordance with National Fire Protection Association (NFPA) codes and standards ensure that the water-based fire protection systems are capable of performing their intended function. The fire water system pressure is continuously monitored such that loss of system pressure is immediately detected and corrective actions initiated.

The Fire Water System program conducts an air or water flow test through each open head spray/sprinkler nozzle to verify the flow is unobstructed. The Fire Water System program will replace sprinklers prior to 50 years in service or the program will field service test a representative sample of the sprinklers and test them every 10 years thereafter during the period of extended operation to ensure signs of degradation, such as corrosion, are detected in a timely manner.

Volumetric examinations will be performed on fire water piping. As an alternative, internal inspections will be performed on accessible exposed portions of fire water piping during plant maintenance activities. The inspections detect loss of material due to corrosion, ensure that aging effects are managed, ensure wall thickness is within acceptable limits, and detect degradation before the loss of intended function. If a representative number of inspections have not been completed prior to the period of extended operation, the fire protection coordinator determines that additional inspections or examinations are required, locations will be selected based on system susceptibility to corrosion or fouling and evidence of performance degradation during system flow testing or periodic flushes. If material and environment conditions for above grade and below grade piping are similar, the results of the inspections of the internal surfaces of the above grade fire protection piping can be extrapolated to evaluate the condition of the internal surfaces of the below grade fire protection piping. If not, additional inspection activities are needed to ensure that the intended function of below grade fire protection piping will be maintained consistent with the current licensing basis.

NUREG-1801 Consistency

The Fire Water System program is an existing program that, following enhancement, will be consistent, with exception to NUREG-1801, Section XI.M27, Fire Water System.

Exceptions to NUREG-1801

Program Elements Affected:

Scope of Program (Element 1)

NUREG-1801 provides a program for managing carbon steel and cast iron components in fire water systems. The fire water system contains additional materials of construction, specifically, copper alloy and stainless steel. The Fire Water System program manages aging effects of copper alloy and stainless steel fire water system components with an internal environment of water.

Detection of Aging Effects (Element 4)

NUREG-1801 requires inspection of fire protection systems in accordance with the guidance of NFPA-25. STP performs power block hose station gasket inspections at least once every 18 months, rather than annually as specified by NFPA-25. STP has been inspecting at an 18 month frequency for over 10 years, and no degradation leading to a loss of function has occurred. A visual inspection of hose stations is conducted every six months for accessible locations and 18 months for stations that are not accessible during normal operations. These hoses are also hydrostatically tested every three years. Hoses are replaced when indications of deterioration are observed either by visual inspection or failure of a hydrostatic test, this replacement includes inspection of the gasket. Since aging effects are typically manifested over several years, differences in inspection and testing frequencies are insignificant.

Enhancements

Prior to the period of extended operation, the following enhancements will be implemented in the following program elements:

Preventive Actions (Element 2), Parameters Monitored or Inspected (Element 3,) and Detection of Aging Effects (Element 4)

Procedures will be enhanced to include volumetric examinations or direct measurement on representative locations of the fire water system to determine pipe wall thickness.

Detection of Aging Effects (Element 4)

Procedures will be enhanced to replace sprinklers prior to 50 years in service or field service test a representative sample and test every 10 years thereafter to ensure signs of degradation are detected in a timely manner.

Monitoring and Trending (Element 5)

Procedures will be enhanced for trending of fire water piping flow parameters recorded during fire water flow tests.

Operating Experience

A review of the past 12 years of plant operating experience showed no signs of gasket degradation or fire hose degradation due to inspection intervals of 18 months and three years, respectively.

The review of operating experience contained in STP condition reports (CRs) were evaluated for aging effects associated with the Fire Water System program. Of these CRs, 45 were determined to have applicable aging effects associated with the Fire Water System program. The following is a summary of the aging effects reported in these CRs.

Leakage has been discovered coming from supply line piping connections. The associated connections were repaired by replacing the gasket and no further leakage has been observed from these locations. Leakage from fire hydrants has been observed at hydrant barrel connections. The hydrants were evaluated and replaced. Drain valves have leaked by causing corrosion to the associated surface. The valves were replaced and the problem was corrected.

Leakage has been observed from the threaded connections to installed relief valves. These connections were repaired and no further leakage has been observed from the threaded connections. Valve packing leakage in supply line valves has caused corrosion of the associated packing follower and retaining bolts. The leakage was corrected and degraded components were evaluated and replaced where required.

While performing the ~~fire~~ five-year inspection of a fire water storage tank it was noted that the base of the tank needed repainted, that a weld located at the top of the tank between the roof and sidewall needed to be repaired and a recirculation line pipe hanger needed to be replaced. The base of the tank was repainted, the weld was repaired and the hanger was replaced. No loss of intended function occurred.

Based on this review of STP operating experience, the Fire Water System program effectively identifies and corrects the fire water system components aging effects prior to the loss of intended function.

Conclusion
The continued implementation of the Fire Water System program provides reasonable assurance that aging effects will be managed such that the systems and components within the scope of this program will continue to perform their intended functions consistent with the current licensing basis for the period of extended operation.

[From Appendix E of the LRA – Applicant's Environmental Report]

Section 2.17
References

NRC (U.S. Nuclear Regulatory Commission) 1975. Final Environmental Statement related to the proposed South Texas Project Units 1 & 2, NUREG 75/019, Docket Nos. 50-498 and 50-499. Office of Nuclear Reactor Regulation, Washington, DC. March.

NRC (U.S. Nuclear Regulatory Commission) 1986. Final Environmental Statement related to the operation of South Texas Project, Units 1 & 2, NUREG-1177~~1~~, Docket Nos. 50-498 and 50-499. Office of Nuclear Reactor Regulation, Washington, DC. August.

NUS (NUS Corporation) 1976. Final Report Colorado River Entrainment Monitoring Program, Phase One Studies April 1975–March 1976. Prepared for South Texas Project by Ecological Sciences Division, NUS Corporation, Rockville, MD. December.

Enclosure 3

Revised Regulatory Commitments

A4 License Renewal Commitments

Table A4-1 identifies proposed actions committed to by STPNOC for STP Units 1 and 2 in its License Renewal Application. These and other actions are proposed regulatory commitments. This list will be revised, as necessary, in subsequent amendments to reflect changes resulting from NRC questions and STPNOC responses. STPNOC will utilize the STP commitment tracking system to track regulatory commitments. The Condition Report (CR) number in the Implementation Schedule column of the table is for STPNOC tracking purposes and is not part of the amended LRA.

Table A4-1 License Renewal Commitments

Item #	Commitment	LRA Section	Implementation Schedule
9	Enhance the Fuel Oil Chemistry program procedures to: • extend the scope of the program to include the SDG fuel oil drain tanks, • check and remove the accumulated water from the fuel oil drain tanks, day tanks, and storage tanks associated with the SDG, BOP, lighting diesel generator, and fire water pump diesel generators. A minimum frequency of water removal from the fuel oil tanks will be included in the procedure, • include 10-year periodic draining, cleaning, and inspection for corrosion of the SDG fuel oil drain tanks, lighting diesel generator fuel oil tank, and diesel fire pump fuel oil storage tanks, • inspect the BOP diesel generator fuel oil day tanks and the lighting diesel generator fuel oil tank for internal corrosion, • require periodic testing of the lighting diesel generator fuel oil tank and the SDG and diesel fire pump fuel oil storage tanks for microbiological organisms, • require analysis for water, biological activity, sediment, and particulate contamination of the diesel fire pump fuel oil storage tanks, lighting diesel generator fuel oil tank, and the BOP diesel generator fuel oil day tanks on a quarterly basis, • conduct ultrasonic testing or pulsed eddy current thickness examination to detect corrosion-related wall thinning once on the tank bottoms for the SDG and diesel fire pump, and the BOP diesel generator fuel oil day tanks, and • incorporate the sampling and testing of the diesel fire pump fuel oil storage tanks for particulate contamination and water and to incorporate the trending of water, particulate contamination, and microbiological activity in the SDG and diesel fire pump fuel oil storage tanks, lighting diesel generator fuel oil tank, and the BOP diesel generator fuel oil day tanks.	B2.1.14	Prior to the period of extended operation CR 10-23261

26	Enhance the RG 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants program procedures to: • specify inspections at intervals not to exceed five years or to immediately follow significant natural phenomena except sediment monitoring, which is performed every ten years. • specify the preventive actions for storage, protection and lubricants recommended in Section 2 of Research Council for Structural Connections publication "Specification for Structural Joints Using ASTM A325 or A490 Bolts" for ASTM A325, ASTM F1852 and/or ASTM 490 bolts. • specify ACI 349.3R-96 and ACI 201.1R-68 as the basis for defining quantitative acceptance criteria.	B2.1.33	Prior to the period of extended operation CR 10-23601