



**TECHNICAL REPORT: LR-1921/LR-2921**

**LICENSE RENEWAL PROJECT  
POSITION PAPER**

**AGING MANAGEMENT OF CRITERION 2 (NS>SR) COMPONENT  
GROUPS NOT ADDRESSED IN  
AGING MANAGEMENT REVIEW REPORTS**

**SURRY AND NORTH ANNA POWER STATIONS**

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**TABLE OF CONTENTS**

1.0 PURPOSE ..... 4

2.0 BACKGROUND ..... 4

3.0 DISCUSSION ..... 5

    3.1 NON-FLUID-CONTAINING COMPONENT GROUPS ..... 6

    3.2 FLUID-CONTAINING COMPONENT GROUPS ..... 7

        3.2.1 Identification of Fluid-Containing Component Groups and Aging  
            Management Review ..... 7

        3.2.2 External Surfaces of Fluid-Containing Components ..... 8

        3.2.3 Internal Surfaces of Fluid-Containing Components ..... 8

4.0 CONCLUSION ..... 9

5.0 REFERENCES ..... 10

6.0 ATTACHMENTS ..... 12

## 1.0 PURPOSE

The purpose of this technical report is to document the Dominion position on the integrated plant assessment of non-safety-related system components that are spatially oriented near safety-related system components. This report is the result of (1) the clarification of the Nuclear Regulatory Commission (NRC) scope definition of Criterion 2 (NS>SR) ascertained in the Dominion discussions with the NRC staff during the Scoping Audit and (2) subsequent Request for Additional Information (RAI) 2.1-3 and 2.1-4 (Reference 5.2). These non-safety-related components may require aging management to ensure that their limited structural integrity and/or pressure boundary is maintained, precluding adverse affects on nearby safety-related components.

This Dominion position envelops any aging management of non-safety-related components that may have been excluded based on Guideline #1, Loss of SR Component Versus Loss of the SR Function, of Technical Report LR-1007/LR-2007, Rev. 3, *Criterion 2 Report: Non-Safety-Related Affecting Safety-Related Surry and North Anna Power Stations* (Reference 5.1), and as subsequently discussed in RAI 2.1-1 (Reference 5.2).

## 2.0 BACKGROUND

Paragraph 4(a)(2) of 10 CFR 54, *Requirements for Renewal of Operating Licenses for Nuclear Power Plants* (Reference 5.3), defines the criteria for determining which plant Criterion 2 systems, structures, and components are within the scope of license renewal. Section (a)(2) of Paragraph 4 identifies the regulations to be considered:

“All non-safety-related systems, structures, and components whose failure could prevent satisfactory accomplishment of any of the functions identified in Paragraphs (a)(1)(i), (ii), or (iii) of this section.

Paragraphs (a)(1)(i), (ii), and (iii) read as follows:

“Safety-related systems, structures, and components that are relied on to remain functional during and following design-basis events to ensure the following functions:

- (i) The integrity of the reactor coolant pressure boundary;
- (ii) The capability to shut down the reactor and maintain it in a safe shutdown condition; or
- (iii) The capability to prevent or mitigate the consequences of accidents that could result in potential offsite exposure comparable to those referred to in 50.43(a)(1), 50.67(b)(2), or 10 CFR 100.11 (Reference 5.4) of this chapter, as applicable.”

Therefore, all systems, structures, and components (SCCs) that perform a function that supports compliance with 10 CFR 54.4(a)(2), *Criterion 2*, which is a non-safety affecting safety-related (SR) function, are in the scope of license renewal.

Additionally, the Statements of Consideration for Part 54, Section III.b. iii, *Bounding the Scope of Review*, state that:

“Pre-application rule implementation has indicated that the description of systems, structures, and components subject to review for license renewal could be broadly interpreted and result in an unnecessary expansion of the review. To limit this possibility for the scoping category relating to non-safety-related systems, structures, and components, the Commission intends this non-safety-related category (54.4(a)(2)) to apply to systems, structures, and components whose failure would prevent the accomplishment of an intended function of a safety-related system, structure, or component. An applicant for license renewal should rely on the plant's CLB, actual plant-specific experience, industry-wide operating experience, as appropriate, and existing engineering evaluations to determine those non-safety-related systems, structures, and components that are the initial focus of the license renewal review. Consideration of hypothetical failures that could result from system interdependencies that are not part of the CLB and that have not been previously experienced is not required.”

### 3.0 DISCUSSION

This section presents the Dominion position on non-fluid-containing component groups and fluid-containing component groups, and it describes the methodology for scoping mechanical systems with respect to 10 CFR 54.4(a)(2) (Reference 5.3). A non-fluid-containing component is a component that has no reasonable potential to contain liquids and/or steam (e.g. ventilation duct, valve yoke, motor, compressed dry air valve or pipe, etc.). A fluid-containing component is a component that contains or has the potential to contain liquids and/or steam, which could promote age related degradation (e.g. valves, heat exchanger, relief valve discharge pipe, etc.). The fluid-containing component groups have been further evaluated to determine if an aging management review is required in accordance with 10 CFR 54.21. For those component groups with a license renewal intended function, the appropriate aging activities are identified to provide assurance that age-related degradation of these Criterion 2 (NS>SR) component groups is adequately managed.

This technical position paper introduces a new license renewal intended function: limited structural integrity (LSI). LSI is defined as sufficient structural integrity to preclude detrimental effects on safety-related components.

Spatial relationship is based primarily on structure and system. A non-safety-related component is assumed to have a spatial relationship with a safety-related component if it meets the following requirements:

1. The component resides in a structure identified in this technical report (Attachment 1).
2. The component is within an in-scope system with expanded boundaries (Attachment 2)

or

The component is within an additional in-scope system added to the scope of license renewal as a result of this technical report (Attachment 3).

3. The component is not specifically excluded by this report (Attachment 4 and Attachment 5).

The engineering evaluations for Criterion 2 have been divided into two parts: non-fluid-containing component groups and fluid-containing component groups. Non-fluid-containing component groups and fluid-containing component groups have been evaluated for limited structural integrity and pressure boundary intended functions. These evaluations are presented in Subsections 3.1 and 3.2.

### 3.1 NON-FLUID-CONTAINING COMPONENT GROUPS

Non-fluid-containing component groups (e.g. ventilation duct, instrument air valves, valve actuators, etc.) that are spatially orientated near safety-related components are located in sheltered areas and, therefore, are not exposed to adverse environments that promote age-related degradation. As verification, an operating experience review has been completed relative to age-related degradation. The review has included over 50 industry Licensee Event Reports (INPO database) and over 500 North Anna and Surry Deviation Reports from the Corrective Action System (Reference 5.5). Additionally, the NRC web site and the ADAMS database were queried for relevant operating experience relating to age related degradation of non-fluid containing components. The operating experience review has identified no age-related degradation of non-fluid-containing components that would result in their loss of the limited structural integrity function. Non-fluid-containing components, as such, do not present a potential for flooding or spraying that could affect safety-related components. Additionally, the walkdowns and inspections that were performed to resolve Generic Letter 87-02 (Reference 5.19) using *Generic Implementation Procedure for Seismic Verification of Nuclear Plant Equipment* (Reference 5.6), have affirmed that the North Anna and Surry component design is robust and rugged.

Therefore, the loss of limited structural integrity or pressure boundary functions are not credible for non-fluid-containing component groups that are spatially oriented

near safety-related components, and these component groups are not within the scope of license renewal for Criterion II/I.

### **3.2 FLUID-CONTAINING COMPONENT GROUPS**

A fluid-containing component contains or has the potential to contain liquids and/or steam. The fluid-containing component may also contain contaminants in the liquid and/or steam. This could result in age-related degradation and potentially lead to the loss of pressure boundary or of limited structural integrity. Additionally, the fluid may reach temperatures below the dew point of the air within the sheltered environment. This could result in condensation that causes intermittent wetting of the external surfaces of the fluid-containing component group. Intermittent wetting can lead to external age-related degradation.

Therefore, there is a potential loss of limited structural integrity or pressure boundary functions for fluid-containing components, and those that are spatially oriented near safety-related components are within the scope of license renewal for Criterion 2 and require aging management review.

#### **3.2.1 Identification of Fluid-Containing Component Groups and Aging Management Review**

The following methodology has been used to identify and evaluate the non-safety-related components that are spatially orientated near safety-related components.

- Query the License Renewal Information Management System (LRIMS) database to determine the structures that contain safety-related components (Reference 5.18).
- Query LRIMS to determine the non-safety-related system component groups in the structures that contain safety-related components. Because the list is at the component group level, there is no attempt to segregate any Criterion 2 (NS>SR) components that may have been addressed in a previous aging management review. Attachment 1 provides a listing of all North Anna and Surry structures that contain Criterion 2 (NS>SR) Components. Attachment 2 and 3 provides a listing of all North Anna and Surry systems potentially containing Criterion 2 (NS>SR) components.
- Exclude the non-fluid-containing component groups.
- Exclude fluid-containing component groups based on their spatial location or other conditions deemed to present no credible concern for safety-related components. Examples of exclusions would be tanks that are located in isolated cubicles. A justification for all component group exclusions is presented in Attachment 4 (North Anna) and Attachment 5 (Surry).

- Group systems based on similar function, materials, and internal environments (e.g., Surry Aerated Drains, Liquid Waste, and Decontamination). These groupings provide ample representative samples and can be used to trend, track, and predict aging degradation in similar materials and environments.
- Review North Anna and Surry Aging Management Review (AMR) reports for identified systems to ensure consistency with AMR aging effects and aging management activities assignment.
- Assign applicable aging effects and related aging management programs for each system or system grouping based on the function, materials, and internal environments as determined from the AMR review.
- Document the results of the aging management program assessment in Attachment 6, North Anna, and Attachment 7, Surry).

This methodology provides reasonable assurance that aging degradation of the Criterion 2 (NS>SR) components will be adequately managed.

### **3.2.2 External Surfaces of Fluid-Containing Components**

Dominion will manage the fluid-containing components' external surfaces on an "spaces approach" basis for structures containing safety-related components due to the potential for intermittent wetting. The term "spaces approach" is defined in document NEI 95-10 (Reference 5.20) and refers to all systems, structures, and components (SSC) in a particular area of the plant that shares a common, bounding environmental parameter such as temperature, and is in close proximity such as within a room or a portion of the floor of a building. The aging management activities that have been implemented to manage aging are General Condition Monitoring Activities (Reference 5.7), Infrequently Accessed Area Inspection Activities (Reference 5.8), and Boric Acid Corrosion Surveillance (inside Containment only) (Reference 5.9). These activities are a combination of focused inspections and observations.

General Condition Monitoring Activities, Infrequently Accessed Area Inspection Activities, and Boric Acid Corrosion Surveillance (inside Containment) provide reasonable assurance that external age-related degradation of fluid-containing components are adequately managed and that the intended functions of limited structural integrity and pressure boundary are maintained.

### **3.2.3 Internal Surfaces of Fluid-Containing Components**

Fluid-containing components have the potential for contaminants due to the liquid and/or steam internal environment. This could result in age-related degradation and potentially lead to the loss of pressure boundary or of limited structural integrity.



Therefore, there is a potential for the loss of limited structural integrity or pressure boundary functions for fluid-containing components, and those that are spatially oriented near safety-related components require aging management review.

The following aging management activities are credited with the management of the internal surfaces of fluid-containing non-safety-related component groups that are spatially orientated near safety-related components.

- Chemistry Control Program for Primary Systems (Reference 5.10 and 5.11)
- Chemistry Control Program for Secondary Systems (Reference 5.12 and 5.13)
- Secondary Piping and Component Inspection (Reference 5.14)
- Service Water System Inspections (Reference 5.15 and 5.16)
- Work Control Process (Reference 5.17)

These aging management activities ensure the effects of aging on Criterion 2 (NS>SR) component groups not previously addressed in an aging management review will be managed to provide reasonable assurance that the limited structural integrity and pressure boundary intended functions will be maintained during the extended period of operation.

#### **4.0 CONCLUSION**

The effects of aging on non-safety-related components spatially oriented to affect safety-related components will be managed to provide reasonable assurance that the intended functions of safety-related SSC will be maintained during the extended period of operation.

## 5.0 REFERENCES

- 5.1 LR-1007/LR-2007, *Criterion 2 Report: Non-Safety-Related Affecting Safety-Related Surry and North Anna Power Stations*, Technical Report, License Renewal Project, Dominion.
- 5.2 Nuclear Regulatory Commission License Correspondence, Serial Number 01-686 (incoming), dated October 22, 2001.
- 5.3 10 CFR 54, *Requirements for Renewal of Operating Licenses for Nuclear Power Plants*, U. S. Code of Federal Regulations, U. S. Nuclear Regulatory Commission.
- 5.4 10 CFR 100, *Reactor Site Criteria*, U. S. Code of Federal Regulations, U. S. Nuclear Regulatory Commission.
- 5.5 VPAP-1601, *Corrective Action*, Station Administrative Procedure, Dominion.
- 5.6 *Generic Implementation Procedure for Seismic Verification of Nuclear Plant Equipment*, Seismic Qualification Utility Group Report.
- 5.7 LR-1766/LR-2766, *General Condition Monitoring (Normally Accessed Areas)*, Aging Management Activity, License Renewal Project, Dominion.
- 5.8 LR-1768/LR-2768, *Infrequently Accessed Area Inspection*, Aging Management Activity (AMA) Technical Report, License Renewal Project, Dominion.
- 5.9 LR-1706/LR-2706, *Boric Acid Corrosion Surveillance*, Aging Management Activity, License Renewal Project, Dominion.
- 5.10 LR-2710, *Chemistry Control Program for Primary Systems – North Anna*, Aging Management Activity (AMA) Technical Report, License Renewal Project, Dominion.
- 5.11 LR-1710, *Chemistry Control Program for Primary Systems – Surry*, Aging Management Activity, License Renewal Project, Dominion.
- 5.12 LR-2712, *Chemistry Control for Secondary Systems*, Aging Management Activity (AMA) Technical Report, License Renewal Project, Dominion.
- 5.13 LR-1712, *Chemistry Control for Secondary Systems*, Aging Management Activity, License Renewal Project, Dominion.
- 5.14 LR-1724/LR-2724, *Secondary Piping and Component Inspection Program*, Aging Management Activity (AMA) Technical Report, License Renewal Project, Dominion.
- 5.15 LR-2754, *Service Water System Inspections*, Aging Management Activity (AMA) Technical Report, License Renewal Project, Dominion.

- 5.16 LR-1754, *Service Water System Inspections*, Aging Management Activity (AMA) Technical Report, License Renewal Project, Dominion.
- 5.17 LR-1762/LR-2762, *Work Control Process Activities*, Aging Management Activity, License Renewal Project, Dominion.
- 5.18 *License Renewal Information Management System (LRIMS)*, Computerized Database, License Renewal Project, Dominion.
- 5.19 Generic Letter 87-02, *Verification of Seismic Adequacy of Mechanical and Electrical Equipment in Operating Reactors, Unresolved Safety Issue (USI) A-46*, U. S. Nuclear Regulatory Commission.
- 5.20 NEI 95-10, *Industry Guidelines for Implementing the Requirements of 10 CFR Part 54 – The License Renewal Rule*, Nuclear Energy Institute.

## 6.0 ATTACHMENTS

- Attachment 1 - Structures Containing Non-Safety-Related Components with Potential Spatial Orientation to Safety-Related Components
- Attachment 2 - Systems with Increased License Renewal Boundary Due to Expansion of Criterion 2 Scope
- Attachment 3 - Systems Added to the Scope of Licensing Renewal Due to Expansion of License Renewal Scope
- Attachment 4 - Exclusion of Criterion 2 (NS>SR) Fluid-Containing Mechanical Component Groups – North Anna
- Attachment 5 - Exclusion of Criterion 2 (NS>SR) Fluid-Containing Mechanical Component Groups – North Anna
- Attachment 6 - Management of Aging Effects for Criterion 2 (NS>SR) Fluid-Containing Mechanical Component Groups – North Anna
- Attachment 7 - Management of Aging Effects for Criterion 2 (NS>SR) Fluid-Containing Mechanical Component Groups – Surry

**Attachment 1**  
**Structures Containing Non-Safety-Related Components with Potential Spatial Orientation to Safety-Related Components**

Surry	North Anna
Auxiliary Building	Auxiliary Building
Containment	Auxiliary Feedwater Pump House
Containment Spray Pump Bldg.	Casing Cooling Pump House
Fuel Building	Containment
Fuel Oil Pump house	Fuel Building
High Level Intake Structure	Fuel Oil Pump House
Low Level Intake Structure	Intake Structure
Main Steam Valve House	Main Steam Valve House
Service Building	Quench Spray Pump House
Safeguards Building	Service Building
Turbine Building	Safeguards Building
	Service Water Pump House
	Service Water Valve House
	Turbine Building

**Attachment 2**

**Systems with Increased License Renewal Boundary Due to Expansion of Criterion 2 Scope**

<b>North Anna</b>	<b>Surry</b>
Auxiliary Steam (AS)	Auxiliary Steam (AS)
Boron Recovery (BR)	Bearing Cooling (BC)
Component Cooling (CC)	Boron Recovery (BR)
Chilled Water (CD)	Component Cooling (CC)
Chemical and Volume Control (CH)	Chemical and Volume Control (CH)
Condensate (CN)	Condensate (CN)
Containment Vacuum (CV)	Containment Spray (CS)
Circulating Water (CW)	Containment Vacuum (CV)
Drains Aerated (DA)	Circulating Water (CW)
Drains – Building Services (DB)	Drains Aerated (DA)
Drains Gaseous (DG)	Drains Gaseous (DG)
Fuel Pit Cooling (FC)	Fuel Pit Cooling (FC)
Feedwater (FW)	Feedwater (FW)
High Radiation Sampling (HRS)	Gaseous Waste (GW)
Liquid Waste (LW)	Heating (HS)
Main Steam (MS)	Main Steam (MS)
Primary Grade Water (PG)	Primary Grade Water (PG)
Quench Spray (QS)	Plumbing (PL)
Reactor Coolant (RC)	Reactor Coolant (RC)

**Attachment 2**

**Systems with Increased License Renewal Boundary Due to Expansion of Criterion 2 Scope**

North Anna	Surry
Residual Heat Removal (RH)	Residual Heat Removal (RH)
Radwaste (RW)	Recirculation and Transfer (RT)
Steam Drains (SD)	Steam Drains (SD)
Safety Injection (SI)	Safety Injection (SI)
Sampling (SS)	Sampling (SS)
Secondary Vents (SV)	Secondary Vents (SV)
Service Water (SW)	Service Water (SW)
Vents Gaseous (VG)	Vents Aerated (VA)
Vacuum Priming (VP)	Vents Gaseous(VG)
Water Treatment (WT)	Vacuum Priming (VP)
	Ventilation (VS)

**Attachment 3**

**Systems Added to the Scope of Licensing Renewal Due to Expansion of License Renewal Scope**

North Anna	Surry
Bearing Cooling (BC)	Chilled Water (CD)
Decontamination (DC)	Decontamination (DC)
Extraction Steam (ES)	Extraction Steam (ES)
Gaseous Waste (GW)	Liquid Waste (LW)
	Water Treatment (WT)



AGING MANAGEMENT OF CRITERION 2 (NS>SR) COMPONENT GROUPS NOT ADDRESSED IN AMR REPORTS

Attachment 4  
Exclusion of Criterion 2 (NS>SR) Fluid-Containing Mechanical Component Groups – North Anna

System(s)	Component Groups	Material Group(s)	Environment	Exclusion Justification
EH, LO, GM	All	Carbon Steel, Low-alloy Steel, Cast Iron; Copper Alloys; and Stainless Steel	Oil	Component groups are not spatially oriented near safety-related components and pose no credible concern.
LW	Tanks, Pumps	Stainless Steel	Raw Water	Component groups are not spatially oriented near safety-related components and pose no credible concern.
PG	Tanks, Heat Exchangers, Pumps	Stainless Steel	Treated Water	Component groups are not spatially oriented near safety-related components and pose no credible concern.
BR	Filters	Stainless Steel	Treated Water	Component group is not spatially oriented near safety-related components and poses no credible concern.
HRS	Filters	Stainless Steel	Raw Water	Component group is not spatially oriented near safety-related components and poses no credible concern.
FC	Pumps, Filters	Stainless Steel	Treated Water	Component group is not spatially oriented near safety-related components and poses no credible concern.
WT	Tanks, Filters	Carbon Steel, Low-alloy Steel, and Cast Iron and Stainless Steel	Treated Water	Component groups are not spatially oriented near safety-related components and pose no credible concern.
DB	Tanks, Filters, Concrete-encased piping	Carbon Steel, Low-alloy Steel, and Cast Iron and Stainless Steel	Raw Water	Component groups are not spatially oriented near safety-related components and pose no credible concern.

AGING MANAGEMENT OF CRITERION 2 (NS>SR) COMPONENT GROUPS NOT ADDRESSED IN AMR REPORTS

Attachment 4

Exclusion of Criterion 2 (NS>SR) Fluid-Containing Mechanical Component Groups – North Anna

System(s)	Component Groups	Material Group(s)	Environment	Exclusion Justification
GW	Tanks, Filters	Carbon Steel, Low-alloy Steel, and Cast Iron and Stainless Steel	Normally Air, but potential for Liquid or Steam	Component groups are not spatially oriented near safety-related components and pose no credible concern.
FW	Tanks, Pipe, Valves, Filters	Carbon Steel, Low-alloy Steel, Cast Iron; Copper Alloys; and Stainless Steel	Oil	Feedwater Pump lube oil subsystems are not spatially oriented near safety-related components and pose no credible concern.

AGING MANAGEMENT OF CRITERION 2 (NS>SR) COMPONENT GROUPS NOT ADDRESSED IN AMR REPORTS

Attachment 5

Exclusion of Criterion 2 (NS>SR) Fluid-Containing Mechanical Component Groups – Surry

System(s)	Component Groups	Material Group(s)	Environment	Exclusion Justification
EH, LO	All	Carbon Steel, Low-alloy Steel, Cast Iron; Copper Alloys; and Stainless Steel	Oil	Component groups are not spatially oriented near safety-related components and pose no credible concern.
LW, DC	Tanks, Pumps	Stainless Steel	Raw Water	Component groups are not spatially oriented near safety-related components and pose no credible concern.
PG	Tanks, Heat Exchangers, Pumps	Stainless Steel	Treated Water	Component groups are not spatially oriented near safety-related components and pose no credible concern.
BR	Filters	Stainless Steel	Treated Water	Component group is not spatially oriented near safety-related components and poses no credible concern.
SS	Filters	Stainless Steel	Raw Water	Component group is not spatially oriented near safety-related components and poses no credible concern.
FC	Pumps, Filters	Stainless Steel	Treated Water	Component group is not spatially oriented near safety-related components and poses no credible concern.
WT	Tanks, Filters, Pumps	Carbon Steel, Low-alloy Steel, and Cast Iron and Stainless Steel	Treated Water	Component groups are not spatially oriented near safety-related components and pose no credible concern.
RT	Pumps	Stainless Steel	Treated Water	Component group is not spatially oriented near safety-related components and poses no credible concern.

AGING MANAGEMENT OF CRITERION 2 (NS>SR) COMPONENT GROUPS NOT ADDRESSED IN AMR REPORTS

Attachment 5

Exclusion of Criterion 2 (NS>SR) Fluid-Containing Mechanical Component Groups – Surry

System(s)	Component Groups	Material Group(s)	Environment	Exclusion Justification
PL	Tanks, Filters, Concrete-encased piping	Carbon Steel, Low-alloy Steel, and Cast Iron and Stainless Steel	Raw Water	Component groups are not spatially oriented near safety-related components and pose no credible concern.
GW	Tanks, Filters	Carbon Steel, Low-alloy Steel, and Cast Iron and Stainless Steel	Normally Air, but potential for Liquid or Steam	Component groups are not spatially oriented near safety-related components and pose no credible concern.
FW	Tanks, Pipe, Valves, Filters	Carbon Steel, Low-alloy Steel, Cast Iron; Copper Alloys; and Stainless Steel	Oil	Feedwater Pump lube oil subsystems are not spatially oriented near safety-related components and pose no credible concern.

AGING MANAGEMENT OF CRITERION 2 (NS>SR) COMPONENT GROUPS NOT ADDRESSED IN AMR REPORTS

Attachment 6  
Management of Aging Effects for Criterion 2 (NS>SR) Fluid-Containing Mechanical Component Groups – North Anna

System(s)	Intended Function	Material Group(s)	Environment	Aging Effect	Aging Management Activity
BR, DG, HRS, RH, SS, VG, CH, FC, PG, QS, RC, SI, WT, DA, DB, DC, LW, RW, AS, BD, FW, ES, MS, SD, CC, CN, CW, SW, CD, CV, GW, RC, SV, VP, BC	LSI, PB	Stainless Steel (external surfaces)	Air	Loss of Material	General Condition Monitoring Activities  Infrequently Accessed Area Inspection Activities
WT, AS, BD, FW, ES, MS, SD, CC, CN, DB, CW, SW, CD, CV, VA <sup>1</sup> , GW, RC, SV, VP, BC	LSI, PB	Carbon Steel, Low-alloy Steel, and Cast Iron (external surfaces)	Air and Boric Acid Leakage	Loss of Material	Boric Acid Corrosion Surveillance <sup>2</sup>  General Condition Monitoring Activities  Infrequently Accessed Area Inspection Activities

<sup>1</sup> Subsystem of the DA system.

<sup>2</sup> For components inside Containment only.

AGING MANAGEMENT OF CRITERION 2 (NS>SR) COMPONENT GROUPS NOT ADDRESSED IN AMR REPORTS

Attachment 6  
Management of Aging Effects for Criterion 2 (NS>SR) Fluid-Containing Mechanical Component Groups – North Anna

System(s)	Intended Function	Material Group(s)	Environment	Aging Effect	Aging Management Activity
WT, DB, AS, BD, FW, ES, MS, SD, CN, CC, CW, SW, CD, CV, GW, RC, SV, VP, BC	LSI, PB	Copper Alloys (external surfaces)	Air and Boric Acid Leakage	Loss of Material	Boric Acid Corrosion Surveillance <sup>2</sup>
					General Condition Monitoring Activities
					Infrequently Accessed Area Inspection Activities
BR, DG, HRS, RH, SS, VG	LSI, PB	Stainless Steel (internal surfaces)	Treated Water	Cracking (>140° F)	Chemistry Control Program for Primary Systems
					Work Control Process
					Chemistry Control Program for Primary Systems
CH, FC, PG, QS, RC, SI, WT	LSI, PB	Stainless Steel (internal surfaces)	Treated Water	Loss of Material	Work Control Process
					Chemistry Control Program for Primary Systems
					Work Control Process

<sup>2</sup> For components inside Containment only.

AGING MANAGEMENT OF CRITERION 2 (NS>SR) COMPONENT GROUPS NOT ADDRESSED IN AMR REPORTS

Attachment 6  
Management of Aging Effects for Criterion 2 (NS>SR) Fluid-Containing Mechanical Component Groups – North Anna

System(s)	Intended Function	Material Group(s)	Environment	Aging Effect	Aging Management Activity
WT	LSI, PB	Carbon Steel, Low-alloy Steel, Cast Iron; Copper Alloys; and Stainless Steel (internal surfaces)	Raw (Potable) Water and Treated Water (Chemical mixing and injection)	Loss of Material	Work Control Process
DA, DB, DC, LW, RW	LSI, PB	Stainless Steel (internal surfaces)	Raw Water	Loss of Material	Work Control Process
DB	LSI, PB	Carbon Steel, Low-alloy Steel, Cast Iron and Copper Alloys (internal surfaces)	Raw Water	Loss of Material	Work Control Process
AS, BD, FW, ES, MS, SD, CN	LSI, PB	Stainless Steel (internal surfaces)	Treated Water / Steam	Cracking (>140° F)	Chemistry Control Program for Secondary Systems
					Work Control Process
				Chemistry Control Program for Secondary Systems	
Work Control Process					

AGING MANAGEMENT OF CRITERION 2 (NS>SR) COMPONENT GROUPS NOT ADDRESSED IN AMR REPORTS

**Attachment 6**  
**Management of Aging Effects for Criterion 2 (NS>SR) Fluid-Containing Mechanical Component Groups – North Anna**

System(s)	Intended Function	Material Group(s)	Environment	Aging Effect	Aging Management Activity
AS, BD, FW, ES, MS, SD, CN	LSI, PB	Carbon Steel, Low-alloy Steel, Cast Iron; and Copper Alloys (internal surfaces)	Treated Water / Steam	Loss of Material	Chemistry Control Program for Secondary Systems
					Secondary Piping and Component Inspection
					Work Control Process
CC	LSI, PB	Carbon Steel, Low-alloy Steel, Cast Iron; Copper Alloys; and Stainless Steel (internal surfaces)	Treated Water	Loss of Material	Chemistry Control Program for Primary Systems
					Work Control Process
CW, SW	LSI, PB	Carbon Steel, Low-alloy Steel, Cast Iron; Copper Alloys; and Stainless Steel (internal surfaces)	Raw (Lake) Water	Loss of Material	Service Water System Inspections
					Work Control Process



AGING MANAGEMENT OF CRITERION 2 (NS>SR) COMPONENT GROUPS NOT ADDRESSED IN AMR REPORTS

Attachment 6

Management of Aging Effects for Criterion 2 (NS>SR) Fluid-Containing Mechanical Component Groups – North Anna

System(s)	Intended Function	Material Group(s)	Environment	Aging Effect	Aging Management Activity
CD	LSI, PB	Carbon Steel, Low-alloy Steel, Cast Iron; Copper Alloys; and Stainless Steel (internal surfaces)	Treated Water	Loss of Material	Chemistry Control Program for Primary Systems <sup>1</sup>
					Chemistry Control Program for Secondary Systems <sup>2</sup>
					Work Control Process
CV, VA <sup>3</sup> , GW, RC <sup>4</sup> , SV, VP	LSI, PB	Carbon Steel, Low-alloy Steel, Cast Iron; Copper Alloys; and Stainless Steel (internal surfaces)	Air / Gas (with potential for liquid or steam)	Loss of Material	Work Control Process

<sup>1</sup> For CD components in support of Containment Air Coolers

<sup>2</sup> For CD components in support of Control Room Cooling

<sup>3</sup> Subsystem of the DA system.

<sup>4</sup> Normally isolated RC system components.

AGING MANAGEMENT OF CRITERION 2 (NS>SR) COMPONENT GROUPS NOT ADDRESSED IN AMR REPORTS

Attachment 6

Management of Aging Effects for Criterion 2 (NS>SR) Fluid-Containing Mechanical Component Groups – North Anna

System(s)	Intended Function	Material Group(s)	Environment	Aging Effect	Aging Management Activity
BC	LSI, PB	Carbon Steel, Low-alloy Steel, Cast Iron; Copper Alloys; and Stainless Steel (Internal surfaces)	Treated Water	Loss of Material	Chemistry Control Program for Secondary Systems  Work Control Process

AGING MANAGEMENT OF CRITERION 2 (NS>SR) COMPONENT GROUPS NOT ADDRESSED IN AMR REPORTS

Attachment 7

Management of Aging Effects for Criterion 2 (NS>SR) Fluid-Containing Mechanical Component Groups – Surry

System(s)	Intended Function	Material Group(s)	Environment	Aging Effect	Aging Management Activity
BR, DG, RH, SS, VG, CH, FC, PG, CS, RC, SI, WT, DA, DC, LW, VA, AS, BD, FW, ES, MS, SD, CC, CN,, CW, SW, RT, CD, CV, GW, RC, SV, VP, BC, HS, PL	LSI, PB	Stainless Steel (external surfaces)	Air	Loss of Material	General Condition Monitoring Activities  Infrequently Accessed Area Inspection Activities
WT, PL, AS, BD, CN, FW, ES, HS, MS, SD, CC, CD, CV, GW, RC, VS, VA, VP, BC, CW, SW, SV	LSI, PB	Carbon Steel, Low-alloy Steel, and Cast Iron (external surfaces)	Air and Boric Acid Leakage	Loss of Material	Boric Acid Corrosion Surveillance <sup>1</sup>  General Condition Monitoring Activities  Infrequently Accessed Area Inspection Activities
WT, PL, AS, BD, CN, FW, ES, HS, MS, SD, CC, CD, CV, GW, RC, VS, VA, VP, BC, CW, SW, SV	LSI, PB	Copper Alloys (external surfaces)	Air and Boric Acid Leakage	Loss of Material	Boric Acid Corrosion Surveillance <sup>1</sup>  General Condition Monitoring Activities  Infrequently Accessed Area Inspection Activities

<sup>1</sup> For components inside Containment only

AGING MANAGEMENT OF CRITERION 2 (NS>SR) COMPONENT GROUPS NOT ADDRESSED IN AMR REPORTS

Attachment 7

Management of Aging Effects for Criterion 2 (NS>SR) Fluid-Containing Mechanical Component Groups – Surry

System(s)	Intended Function	Material Group(s)	Environment	Aging Effect	Aging Management Activity
BR, DG, RH, SS, VG	LSI, PB	Stainless Steel (internal surfaces)	Treated Water	Cracking (>140° F)	Chemistry Control Program for Primary Systems
				Loss of Material	Work Control Process
CH, CS, FC, PG, RC, RT, SI, WT	LSI, PB	Stainless Steel (internal surfaces)	Treated Water	Loss of Material	Chemistry Control Program for Primary Systems
					Work Control Process
WT	LSI, PB	Carbon Steel, Low-alloy Steel, Cast Iron; Copper Alloys; and Stainless Steel (internal surfaces)	Raw Water (Potable) and Treated Water (Chemical mixing or injection)	Loss of Material	Chemistry Control Program for Primary Systems
					Work Control Process

AGING MANAGEMENT OF CRITERION 2 (NS>SR) COMPONENT GROUPS NOT ADDRESSED IN AMR REPORTS

Attachment 7

Management of Aging Effects for Criterion 2 (NS>SR) Fluid-Containing Mechanical Component Groups – Surry

System(s)	Intended Function	Material Group(s)	Environment	Aging Effect	Aging Management Activity
DA, DC, LW	LSI, PB	Stainless Steel (internal surfaces)	Raw Water	Loss of Material	Work Control Process
PL	LSI, PB	Carbon Steel, Low-alloy Steel, Cast Iron; Copper Alloys; and Stainless Steel (internal surfaces)	Raw Water	Loss of Material	Work Control Process
AS, BD, CN, FW, ES, HS, MS, SD	LSI, PB	Stainless Steel (internal surfaces)	Treated Water / Steam	Cracking (>140° F)	Chemistry Control Program for Secondary Systems
				Loss of Material	Work Control Process
AS, BD, CN, FW, ES, HS, MS, SD	LSI, PB	Carbon Steel, Low-alloy Steel, Cast Iron; and Copper Alloys (internal surfaces)	Treated Water / Steam	Loss of Material	Chemistry Control Program for Secondary Systems
					Work Control Process
					Secondary Piping and Component Inspection
					Work Control Process

AGING MANAGEMENT OF CRITERION 2 (NS>SR) COMPONENT GROUPS NOT ADDRESSED IN AMR REPORTS

Attachment 7

Management of Aging Effects for Criterion 2 (NS>SR) Fluid-Containing Mechanical Component Groups – Surry

System(s)	Intended Function	Material Group(s)	Environment	Aging Effect	Aging Management Activity
CC, CD	LSI, PB	Carbon Steel, Low-alloy Steel, Cast Iron; Copper Alloys; and Stainless Steel (internal surfaces)	Treated Water	Loss of Material	Chemistry Control Program for Primary Systems  Work Control Process
CV, GW, RC <sup>1</sup> , SV, VA, VP	LSI, PB	Carbon Steel, Low-alloy Steel, Cast Iron; Copper Alloys; and Stainless Steel (internal surfaces)	Air / Gas (with potential for liquid or steam)	Loss of Material	Work Control Process
BC, VS	LSI, PB	Carbon Steel, Low-alloy Steel, Cast Iron; Copper Alloys; and Stainless Steel (internal surfaces)	Treated Water	Loss of Material	Chemistry Control Program for Secondary Systems  Work Control Process

<sup>1</sup> Normally isolated RC system components.

AGING MANAGEMENT OF CRITERION 2 (NS>SR) COMPONENT GROUPS NOT ADDRESSED IN AMR REPORTS

Attachment 7

Management of Aging Effects for Criterion 2 (NS>SR) Fluid-Containing Mechanical Component Groups – Surry

System(s)	Intended Function	Material Group(s)	Environment	Aging Effect	Aging Management Activity
CW, SW	LSI, PB	Carbon Steel, Low-alloy Steel, Cast Iron; Copper Alloys; and Stainless Steel	Raw (Brackish) Water	Loss of Material	Service Water System Inspections Work Control Process