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10 CFR 50.90

CNRO-2021-0017

July 1, 2021

ATTN: Document Control Desk  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555-0001

Subject: Application to Revise Technical Specifications to Adopt TSTF 577,  
"Revised Frequencies for Steam Generator Tube Inspections"

Arkansas Nuclear One, Unit 1  
NRC Docket No. 50-313  
Renewed Facility Operating License No. DPR-51

Arkansas Nuclear One, Unit 2  
NRC Docket No. 50-368  
Renewed Facility Operating License No. NPF-6

Waterford Steam Electric Station, Unit 3  
NRC Docket No. 50-382  
Renewed Facility Operating License No. NPF-38

Pursuant to 10 CFR 50.90, Entergy Operations, Inc. (Entergy) is submitting a request for an amendment to the Technical Specifications (TS) for Arkansas Nuclear One, Unit 1 (ANO-1), Arkansas Nuclear One, Unit 2 (ANO-2), and Waterford Steam Electric Station, Unit 3 (Waterford).

Entergy requests adoption of TSTF 577, "Revised Frequencies for Steam Generator Tube Inspections," which is an approved change to the Standard Technical Specifications (STS), into the ANO-1, ANO-2, and Waterford 3 TSs. The TS related to steam generator (SG) tube inspections and reporting are revised based on operating history.

The enclosure provides a description and assessment of the proposed changes. Attachments 1, 2, and 3 provide the existing TS pages marked to show the proposed changes. Attachments 4, 5, and 6 provide revised (clean) TS pages. The TS Bases are not affected by the proposed changes.

Entergy requests that the amendment be reviewed under the Consolidated Line Item Improvement Process (CLIIP). Approval of the proposed amendment is requested within 6 months of completion of the NRC's acceptance review. Once approved, the amendment shall be implemented within 30 days.

Enclosure 2 contains the regulatory commitments made in this submittal.

In accordance with 10 CFR 50.91, "Notice for public comment; State consultation," paragraph (b), Entergy is notifying the State of Arkansas and the State of Louisiana of this amendment request by transmitting a copy of this letter and enclosure to the designated State Official.

Should you have any questions or require additional information, please contact Phil Couture, Sr. Manager, Fleet Regulatory Assurance, Licensing, at 601-368-5102.

I declare under penalty of perjury; the foregoing is true and correct.  
Executed on July 1, 2021.

Respectfully,



Ron Gaston

RWG/rwc

Enclosure 1: Description and Assessment

Attachments to Enclosure:

1. ANO-1 Proposed Technical Specification Changes (Mark-Up)
2. ANO-2 Proposed Technical Specification Changes (Mark-Up)
3. Waterford 3 Proposed Technical Specification Changes (Mark-Up)
4. ANO-1 Revised Technical Specification Pages
5. ANO-2 Revised Technical Specification Pages
6. Waterford 3 Revised Technical Specification Pages

Enclosure 2: List of Regulatory Commitments

cc: NRC Region IV Regional Administrator  
NRC Senior Resident Inspector – ANO  
NRC Senior Resident Inspector – Waterford 3  
NRC Project Manager – ANO  
NRC Project Manager – Waterford 3  
Designated State Official – Arkansas  
Louisiana Department of Environmental Quality NRC Project Manager

**Enclosure 1**

**CNRO-2021-0017**

**Description and Assessment**

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## DESCRIPTION AND ASSESSMENT

### 1.0 DESCRIPTION

Entergy Operations, Inc. (Entergy) requests adoption of TSTF 577, "Revised Frequencies for Steam Generator Tube Inspections," which is an approved change to the Standard Technical Specifications (STS), into the Arkansas Nuclear One, Unit 1 (ANO-1), Arkansas Nuclear One, Unit 2 (ANO-2), and Waterford Steam Electric Station, Unit 3 (Waterford) Technical Specifications (TS). The TS related to steam generator (SG) tube inspections and reporting are revised based on operating history.

### 2.0 ASSESSMENT

#### 2.1 Applicability of Safety Evaluation

Entergy has reviewed the safety evaluation for TSTF 577 provided to the Technical Specifications Task Force in a letter dated April 14, 2021. This review included a review of the NRC staff's evaluation, as well as the information provided in TSTF 577. As described herein, Entergy has concluded that the justifications presented in TSTF 577 and the safety evaluation prepared by the NRC staff are applicable to ANO-1, ANO-2, and Waterford and justify this amendment for the incorporation of the changes to the ANO-1, ANO-2, and Waterford TS.

The current ANO-1, ANO-2, and Waterford SG TS requirements are based on TSTF 510, "Revision to Steam Generator Program Inspection Frequencies and Tube Sample Selection." The ANO-1, ANO-2, and Waterford SG tubes are made from Thermally Treated Alloy 690 (Alloy 690TT).

The ANO 1 initial inspection period described in the SG Program, paragraph d.2, began in April 2021. Entergy will submit a SG Tube Inspection Report meeting the revised TS 5.6.7 requirements within 30 days after implementation of the license amendment.

The ANO 2 initial inspection period described in the SG Program, paragraph d.2, began in October 2018. Entergy will submit a SG Tube Inspection Report meeting the revised TS 6.6.7 requirements within 30 days after implementation of the license amendment.

The Waterford 3 initial inspection period described in the SG Program, paragraph d.2, began in May 2017. Entergy will submit a SG Tube Inspection Report meeting the revised TS 6.9.5.1 requirements within 30 days after implementation of the license amendment.

#### 2.2 Variations

Entergy is proposing the following variations from the TS changes described in TSTF 577 or the applicable parts of the NRC staff's safety evaluation:

### 2.2.1 ANO-1

- The current ANO-1 TS 5.6.7 is titled, "Steam Generator Tube Inspection Reports" (plural). For consistency with TSTF-577 and the STS, it is renamed the "Steam Generator Tube Inspection Report" (singular).
- The current ANO-1 TS 5.6.7 first paragraph references the title of TS 5.5.9, "Steam Generator (SG) Program," without placing the title in quotes. For consistency with TSTF 577 and the STS, the title is placed in quotes.

### 2.2.2 ANO-2

- The ANO-2 TS utilizes different numbering than the Standard Technical Specifications on which TSTF 577 was based. Specifically, the ANO-2 Steam Generator (SG) Program is TS 6.5.9 and the Steam Generator Tube Inspection Report is TS 6.6.7.
- In the current ANO-2 6.5.9 paragraph b.3, the title of TS 3.4.6.2, "Reactor Coolant System Operational Leakage," is in italics and not in quotes. For consistency with TSTF 577, the italics are removed, and the title is placed in quotes.
- In the current ANO-2 6.6.7 introductory paragraph, the title of TS 6.5.9, "Steam Generator (SG) Program," is in italics and not in quotes. For consistency with TSTF 577, the italics are removed, and the title is placed in quotes.

### 2.2.3 Waterford 3

- The Waterford 3 TS utilize different numbering than the Standard Technical Specifications on which TSTF 577 was based. Specifically, the Waterford Steam Generator (SG) Program is TS 6.5.9 and the Steam Generator Tube Inspection Report is TS 6.9.1.5.
- In the current Waterford 6.9.1.5 introductory paragraph, the title of TS 6.5.9, "Steam Generator (SG) Program," is not in quotes. For consistency with TSTF 577, the title is placed in quotes.

These variations are administrative and do not affect the applicability of TSTF 577 to the ANO-1, ANO-2, and Waterford 3 TS.

## 3.0 REGULATORY ANALYSIS

### 3.1 No Significant Hazards Consideration Analysis

Entergy Operations, Inc. (Entergy) requests adoption of TSTF 577, "Revised Frequencies for Steam Generator Tube Inspections," which is an approved change to the Standard Technical Specifications (STS), into the Arkansas Nuclear One, Unit 1 (ANO-1), Arkansas Nuclear One, Unit 2 (ANO-2), and Waterford Steam Electric Station, Unit 3 (Waterford) Technical

Specifications (TS). The TS related to steam generator (SG) tube inspections and reporting are revised based on operating history.

Entergy has evaluated if a significant hazards consideration is involved with the proposed amendment(s) by focusing on the three standards set forth in 10 CFR 50.92, "Issuance of amendment," as discussed below:

1. Does the proposed change involve a significant increase in the probability or consequences of an accident previously evaluated?

Response: No

The proposed change revises the inspection frequencies for SG tube inspections and associated reporting requirements. The SG inspections are conducted as part of the SG Program to ensure and demonstrate that performance criteria for tube structural integrity and accident leakage integrity are met. These performance criteria are consistent with the plant design and licensing basis. With the proposed changes to the inspection frequencies, the SG Program must still demonstrate that the performance criteria are met. As a result, the probability of any accident previously evaluated is not significantly increased and the consequences of any accident previously evaluated are not significantly increased.

Therefore, this change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Does the proposed change create the possibility of a new or different kind of accident from any accident previously evaluated?

Response: No

The proposed change revises the inspection frequencies for SG tube inspections and associated reporting requirements. The proposed change does not alter the design function or operation of the SGs or the ability of a SG to perform the design function. The SG tubes continue to be required to meet the SG Program performance criteria. The proposed change does not create the possibility of a new or different kind of accident due to credible new failure mechanisms, malfunctions, or accident initiators that are not considered in the design and licensing bases.

Therefore, this change does not create the possibility of a new or different kind of accident from an accident previously evaluated.

3. Does the proposed change involve a significant reduction in a margin of safety?

Response: No

The proposed change revises the inspection frequencies for SG tube inspections and associated reporting requirements. The proposed change does not change any of the controlling values of parameters used to avoid exceeding regulatory or licensing limits. The proposed change does not affect a design basis or safety limit, or any controlling value for a parameter established in the UFSAR or the license.

Therefore, this change does not involve a significant reduction in a margin of safety.

Based upon the reasoning presented above, Entergy concludes that the proposed change presents no significant hazards consideration under the standards set forth in 10 CFR 50.92(c), and, accordingly, a finding of "no significant hazards consideration" is justified.

### 3.2 Conclusions

In conclusion, based on the considerations discussed above, (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

## 4.0 Environmental Consideration

A review has determined that the proposed amendment would change a requirement with respect to installation or use of a facility component located within the restricted area, as defined in 10 CFR 20, or would change an inspection or surveillance requirement. However, the proposed amendment does not involve (i) a significant hazards consideration, (ii) a significant change in the types or a significant increase in the amounts of any effluents that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed amendment meets the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the proposed amendment.

## 5.0 Attachments

1. ANO-1 Proposed Technical Specification Changes (Mark-Up)
2. ANO-2 Proposed Technical Specification Changes (Mark-Up)
3. Waterford 3 Proposed Technical Specification Changes (Mark-Up)
4. ANO-1 Revised Technical Specification Pages
5. ANO-2 Revised Technical Specification Pages
6. Waterford 3 Revised Technical Specification Pages



**Enclosure 1, Attachment 1**

**CNRO-2021-0017**

**ANO-1 Proposed Technical Specification Changes (Mark-Up)**

(5 TS Pages Follow)

## 5.0 ADMINISTRATIVE CONTROLS

### 5.5 Programs and Manuals

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#### 5.5.9 Steam Generator (SG) Program

An ~~SG Steam Generator~~ Program shall be established and implemented to ensure that SG tube integrity is maintained. In addition, the ~~SG Steam Generator~~ Program shall include the following:

- a. Provisions for condition monitoring assessments. Condition monitoring assessment means an evaluation of the “as found” condition of the tubing with respect to the performance criteria for structural integrity and accident induced leakage. The “as found” condition refers to the condition of the tubing during an SG inspection outage, as determined from the inservice inspection results or by other means, prior to the plugging of tubes. Condition monitoring assessments shall be conducted during each outage during which the SG tubes are inspected or plugged to confirm that the performance criteria are being met.
- b. Performance criteria for SG tube integrity. SG tube integrity shall be maintained by meeting the performance criteria for tube structural integrity, accident induced leakage, and operational LEAKAGE.
  1. Structural integrity performance criterion: All in-service ~~SG steam generator~~ tubes shall retain structural integrity over the full range of normal operating conditions (including startup, operation in the power range, hot standby, and cool down), all anticipated transients included in the design specification, and design basis accidents. This includes retaining a safety factor of 3.0 against burst under normal steady state full power operation primary to secondary pressure differential and a safety factor of 1.4 against burst applied to the design basis accident primary to secondary pressure differentials. Apart from the above requirements, additional loading conditions associated with the design basis accidents, or combination of accidents in accordance with the design and licensing basis, shall also be evaluated to determine if the associated loads contribute significantly to burst or collapse. In the assessment of tube integrity, those loads that do significantly affect burst or collapse shall be determined and assessed in combination with the loads due to pressure with a safety factor of 1.2 on the combined primary loads and 1.0 on axial secondary loads.
  2. Accident induced leakage performance criterion: The primary to secondary accident induced leakage rate for any design basis accident, other than a SG tube rupture, shall not exceed the leakage rate assumed in the accident analysis in terms of total leakage rate for all SGs and leakage rate for an individual SG. Leakage is not to exceed 1 gpm.
  3. The operational LEAKAGE performance criterion is specified in LCO 3.4.13, “RCS Operational LEAKAGE.”

## 5.0 ADMINISTRATIVE CONTROLS

### 5.5 Programs and Manuals

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- c. Provisions for SG tube plugging criteria. Tubes found by inservice inspection to contain flaws with a depth equal to or exceeding 40% of the nominal tube wall thickness shall be plugged.
- d. Provisions for SG tube inspections. Periodic SG tube inspections shall be performed. The number and portions of the tubes inspected and methods of inspection shall be performed with the objective of detecting flaws of any type (e.g., volumetric flaws, axial and circumferential cracks) that may be present along the length of the tube, from the tube-to-tubesheet weld at the tube inlet to the tube-to-tubesheet weld at the tube outlet, and that may satisfy the applicable tube plugging criteria. The tube-to-tubesheet weld is not part of the tube. In addition to meeting the requirements of d.1, d.2, and d.3 below, the inspection scope, inspection methods, and inspection intervals shall be such as to ensure that SG tube integrity is maintained until the next SG inspection. A degradation assessment shall be performed to determine the type and location of flaws to which the tubes may be susceptible and, based on this assessment, to determine which inspection methods need to be employed and at what locations.
  1. Inspect 100% of the tubes in each SG during the first refueling outage following SG installation.
  2. After the first refueling outage following SG installation, inspect **100% of the tubes in** each SG at least every **9672** effective full power months, **which defines the inspection period.** ~~or at least every third refueling outage (whichever results in more frequent inspections). In addition, the minimum number of tubes inspected at each scheduled inspection shall be the number of tubes in all SGs divided by the number of SG inspection outages scheduled in each inspection period as defined in a, b, c and d below. If a degradation assessment indicates the potential for a type of degradation to occur at a location not previously inspected with a technique capable of detecting this type of degradation at this location and that may satisfy the applicable tube plugging criteria, the minimum number of locations inspected with such a capable inspection technique during the remainder of the inspection period may be prorated. The fraction of locations to be inspected for this potential type of degradation at this location at the end of the inspection period shall be no less than the ratio of the number of times the SG is scheduled to be inspected in the inspection period after the determination that a new form of degradation could potentially be occurring at this location divided by the total number of times the SG is scheduled to be inspected in the inspection period. Each inspection period defined below may be extended up to 3 effective full power months to include a SG inspection outage in an inspection period and the subsequent inspection period begins at the conclusion of the included SG inspection outage.~~

## 5.0 ADMINISTRATIVE CONTROLS

### 5.5 Programs and Manuals

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- a) ~~After the first refueling outage following SG installation, inspect 100% of the tubes during the next 144 effective full power months. This constitutes the first inspection period;~~
  - b) ~~During the next 120 effective full power months, inspect 100% of the tubes. This constitutes the second inspection period;~~
  - c) ~~During the next 96 effective full power months, inspect 100% of the tubes. This constitutes the third inspection period; and~~
  - d) ~~During the remaining life of the SGs, inspect 100% of the tubes every 72 effective full power months. This constitutes the fourth and subsequent inspection periods.~~
3. If crack indications are found in any SG tube, then the next inspection for each affected and potentially affected SG for the degradation mechanism that caused the crack indication shall **be at the next not exceed 24 effective full power months or one** refueling outage ~~(whichever results in more frequent inspections)~~. If definitive information, such as from examination of a pulled tube, diagnostic non-destructive testing, or engineering evaluation indicates that a crack-like indication is not associated with a crack(s), then the indication need not be treated as a crack.
- e. Provisions for monitoring operational primary to secondary LEAKAGE.

#### 5.5.10 Secondary Water Chemistry

This program provides controls for monitoring secondary water chemistry to inhibit SG tube degradation. The program shall include:

- a. Identification of a sampling schedule for the critical variables and control points for these variables;
- b. Identification of the procedures used to measure the values of the critical variables;
- c. Identification of process sampling points;
- d. Procedures for the recording and management of data;
- e. Procedures defining corrective actions for all off control point chemistry conditions; and
- f. A procedure identifying the authority responsible for the interpretation of the data and the sequence and timing of administrative events required to initiate corrective action.

## 5.0 ADMINISTRATIVE CONTROLS

### 5.6 Reporting Requirements

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#### 5.6.6 Reactor Building Inspection Report

Any degradation exceeding the acceptance criteria of the containment structure detected during the tests required by the Containment Inspection Program shall undergo an engineering evaluation within 60 days of the completion of the inspection surveillance. The results of the engineering evaluation shall be reported to the NRC within an additional 30 days of the time the evaluation is completed. The report shall include the cause of the condition that does not meet the acceptance criteria, the applicability of the conditions to the other unit, the acceptability of the concrete containment without repair of the item, whether or not repair or replacement is required and, if required, the extent, method, and completion date of necessary repairs, and the extent, nature, and frequency of additional examinations.

#### 5.6.7 Steam Generator Tube Inspection Reports

A report shall be submitted within 180 days after the initial entry into MODE 4 following completion of an inspection performed in accordance with the Specification 5.5.9, "Steam Generator (SG) Program." The report shall include:

- a. The scope of inspections performed on each SG;
- b. The nondestructive examination techniques utilized for tubes with increased degradation susceptibility;**
- c. For each degradation mechanism found:**
  - 1. The nondestructive examination techniques utilized;**
  - 2. The location, orientation (if linear), measured size (if available), and voltage response for each indication. For tube wear at support structures less than 20 percent through-wall, only the total number of indications needs to be reported;**
  - 3. A description of the condition monitoring assessment and results, including the margin to the tube integrity performance criteria and comparison with the margin predicted to exist at the inspection by the previous forward-looking tube integrity assessment; and**
  - 4. The number of tubes plugged during the inspection outage.**
- d. An analysis summary of the tube integrity conditions predicted to exist at the next scheduled inspection (the forward-looking tube integrity assessment) relative to the applicable performance criteria, including the analysis methodology, inputs, and results;**

- ~~b. Degradation mechanisms found,~~
  - ~~c. Nondestructive examination techniques utilized for each degradation mechanism,~~
  - ~~d. Location, orientation (if linear), and measured sizes (if available) of service induced indications,~~
  - ~~e. Number of tubes plugged during the inspection outage for each degradation mechanism,~~
  - ef.** The number and percentage of tubes plugged to date, and the effective plugging percentage in each SG; **and,**
  - f. The results of any SG secondary side inspections.**
  - ~~g. The results of condition monitoring, including the results of tube pulls and in-situ testing.~~
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**Enclosure 1, Attachment 2**

**CNRO-2021-0017**

**ANO-2 Proposed Technical Specification Changes (Mark-Up)**

(5 TS Pages Follow)

6.5.9 Steam Generator (SG) Program

An ~~SG Steam Generator~~ Program shall be established and implemented to ensure that SG tube integrity is maintained. In addition, the ~~SG Steam Generator~~ Program shall include the following:

- a. Provisions for condition monitoring assessments. Condition monitoring assessment means an evaluation of the “as found” condition of the tubing with respect to the performance criteria for structural integrity and accident induced leakage. The “as found” condition refers to the condition of the tubing during an SG inspection outage, as determined from the inservice inspection results or by other means, prior to the plugging of tubes. Condition monitoring assessments shall be conducted during each outage during which the SG tubes are inspected or plugged to confirm that the performance criteria are being met.
- b. Performance criteria for SG tube integrity. SG tube integrity shall be maintained by meeting the performance criteria for tube structural integrity, accident induced leakage, and operational leakage.
  1. Structural integrity performance criterion: All in-service ~~SG steam generator~~ tubes shall retain structural integrity over the full range of normal operating conditions (including startup, operation in the power range, hot standby, and cool down), all anticipated transients included in the design specification, and design basis accidents. This includes retaining a safety factor of 3.0 against burst under normal steady state full power operation primary to secondary pressure differential and a safety factor of 1.4 against burst applied to the design basis accident primary to secondary pressure differentials. Apart from the above requirements, additional loading conditions associated with the design basis accidents, or combination of accidents in accordance with the design and licensing basis, shall also be evaluated to determine if the associated loads contribute significantly to burst or collapse. In the assessment of tube integrity, those loads that do significantly affect burst or collapse shall be determined and assessed in combination with the loads due to pressure with a safety factor of 1.2 on the combined primary loads and 1.0 on axial secondary loads.
  2. Accident induced leakage performance criterion: The primary to secondary accident induced leakage rate for any design basis accident, other than a SG tube rupture, shall not exceed the leakage rate assumed in the accident analysis in terms of total leakage rate for all SGs and leakage rate for an individual SG. Leakage is not to exceed 1 gpm through any one SG.
  3. The operational leakage performance criterion is specified in LCO 3.4.6.2, "~~Reactor Coolant System Operational Leakage.~~"
- c. Provisions for SG tube plugging criteria. Tubes found by inservice inspection to contain flaws with a depth equal to or exceeding 40% of the nominal tube wall thickness shall be plugged.



6.5.9 Steam Generator (SG) Program (continued)

d. Provisions for SG tube inspections. Periodic SG tube inspections shall be performed. The number and portions of the tubes inspected and methods of inspection shall be performed with the objective of detecting flaws of any type (e.g., volumetric flaws, axial and circumferential cracks) that may be present along the length of the tube, from the tube-to-tubesheet weld at the tube inlet to the tube-to-tubesheet weld at the tube outlet, and that may satisfy the applicable tube plugging criteria. The tube-to-tubesheet weld is not part of the tube. In addition to meeting the requirements of d.1, d.2, and d.3 below, the inspection scope, inspection methods, and inspection intervals shall be such as to ensure that SG tube integrity is maintained until the next SG inspection. A degradation assessment shall be performed to determine the type and location of flaws to which the tubes may be susceptible and, based on this assessment, to determine which inspection methods need to be employed and at what locations.

1. Inspect 100% of the tubes in each SG during the first refueling outage following SG installation.
2. After the first refueling outage following SG installation, inspect **100% of the tubes in** each SG at least every **9672** effective full power months, **which defines the inspection period.** ~~or at least every third refueling outage (whichever results in more frequent inspections). In addition, the minimum number of tubes inspected at each scheduled inspection shall be the number of tubes in all SGs divided by the number of SG inspection outages scheduled in each inspection period as defined in a, b, c and d below. If a degradation assessment indicates the potential for a type of degradation to occur at a location not previously inspected with a technique capable of detecting this type of degradation at this location and that may satisfy the applicable tube plugging criteria, the minimum number of locations inspected with such a capable inspection technique during the remainder of the inspection period may be prorated. The fraction of locations to be inspected for this potential type of degradation at this location at the end of the inspection period shall be no less than the ratio of the number of times the SG is scheduled to be inspected in the inspection period after the determination that a new form of degradation could potentially be occurring at this location divided by the total number of times the SG is scheduled to be inspected in the inspection period. Each inspection period defined below may be extended up to 3 effective full power months to include a SG inspection outage in an inspection period and the subsequent inspection period begins at the conclusion of the included SG inspection outage.~~
  - ~~a) After the first refueling outage following SG installation, inspect 100% of the tubes during the next 144 effective full power months. This constitutes the first inspection period;~~
  - ~~b) During the next 120 effective full power months, inspect 100% of the tubes. This constitutes the second inspection period;~~

## ADMINISTRATIVE CONTROLS

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### 6.5.9 Steam Generator (SG) Program (continued)

- ~~c) — During the next 96 effective full power months, inspect 100% of the tubes. This constitutes the third inspection period; and~~
- ~~d) — During the remaining life of the SGs, inspect 100% of the tubes every 72 effective full power months. This constitutes the fourth and subsequent inspection periods.~~

3. If crack indications are found in any SG tube, then the next inspection for each affected and potentially affected SG for the degradation mechanism that caused the crack indication shall **be at the next not exceed 24 effective full power months or one** refueling outage ~~(whichever results in more frequent inspections)~~. If definitive information, such as from examination of a pulled tube, diagnostic non-destructive testing, or engineering evaluation indicates that a crack-like indication is not associated with a crack(s), then the indication need not be treated as a crack.

- e. Provisions for monitoring operational primary to secondary leakage.

### 6.5.10 Secondary Water Chemistry

This program provides controls for monitoring secondary water chemistry to inhibit SG tube degradation. The program shall include:

- a. Identification of a sampling schedule for the critical variables and control points for these variables;
- b. Identification of the procedures used to measure the values of the critical variables;
- c. Identification of process sampling points;
- d. Procedure for the recording and management of data;
- e. Procedures defining corrective actions for all off control point chemistry conditions; and
- f. A procedure identifying the authority responsible for the interpretation of the data, and the sequence and timing of administrative events required to initiate corrective action.

6.6.6 Containment Inspection Report

Any degradation exceeding the acceptance criteria of the containment structure detected during the tests required by the Containment Tendon Surveillance Program shall undergo an engineering evaluation within 60 days of the completion of the inspection surveillance. The results of the engineering evaluation shall be reported to the NRC within an additional 30 days of the time the evaluation is completed. The report shall include the cause of the condition that does not meet the acceptance criteria, the applicability of the conditions to the other unit, the acceptability of the concrete containment without repair of the item, whether or not repair or replacement is required and, if required, the extent, method, and completion date of necessary repairs, and the extent, nature, and frequency of additional examinations.

6.6.7 Steam Generator Tube Inspection Report

A report shall be submitted within 180 days after the initial entry into HOT SHUTDOWN following completion of an inspection performed in accordance with the Specification 6.5.9, "**Steam Generator (SG) Program.**" The report shall include:

- a. The scope of inspections performed on each SG;
- b. The nondestructive examination techniques utilized for tubes with increased degradation susceptibility;**
- c. For each degradation mechanism found:**
  - 1. The nondestructive examination techniques utilized;**
  - 2. The location, orientation (if linear), measured size (if available), and voltage response for each indication. For tube wear at support structures less than 20 percent through-wall, only the total number of indications needs to be reported;**
  - 3. A description of the condition monitoring assessment and results, including the margin to the tube integrity performance criteria and comparison with the margin predicted to exist at the inspection by the previous forward-looking tube integrity assessment; and**
  - 4. The number of tubes plugged during the inspection outage.**
- ~~d. An analysis summary of the tube integrity conditions predicted to exist at the next scheduled inspection (the forward-looking tube integrity assessment) relative to the applicable performance criteria, including the analysis methodology, inputs, and results;~~
- ~~b. Degradation mechanisms found,~~
- ~~c. Nondestructive examination techniques utilized for each degradation mechanism,~~
- ~~d. Location, orientation (if linear), and measured sizes (if available) of service induced indications,~~

- ~~e. Number of tubes plugged during the inspection outage for each degradation mechanism;~~
- ef. The number and percentage of tubes plugged to date, and the effective plugging percentage in each SG;<sup>7</sup> and
- f. The results of any SG secondary side inspections.**
- ~~g. The results of condition monitoring, including the results of tube pulls and in-situ testing.~~

#### 6.6.8 Specific Activity

The results of specific activity analysis in which the primary coolant exceeded the limits of Specification 3.4.8. The following information shall be included: (1) Reactor power history starting 48 hours prior to the first sample in which the limit was exceeded; (2) Results of the last isotopic analysis for radioiodine performed prior to exceeding the limit, results of analysis while limit was exceeded the results of one analysis after the radioiodine activity was reduced to less than limit. Each result should include date and time of sampling and the radioiodine concentrations; (3) Clean-up system flow history starting 48 hours prior to the first sample in which the limit was exceeded; (4) Graph of the I-131 concentration and one other radioiodine isotope concentration in microcuries per gram as a function of time for the duration of the specific activity above the steady-state level; and (5) The time duration when the specific activity of the primary coolant exceeded the radioiodine limit.

**Enclosure 1, Attachment 3**

**CNRO-2021-0017**

**Waterford 3 Proposed Technical Specification Changes (Mark-Up)**

(6 TS Pages Follow)

## ADMINISTRATIVE CONTROLS

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### 6.5.8 DELETED

### 6.5.9 STEAM GENERATOR (SG) PROGRAM

An ~~SG Steam Generator~~ Program shall be established and implemented to ensure that SG tube integrity is maintained. In addition, the ~~SG Steam Generator~~ Program shall include the following:

- a. Provisions for condition monitoring assessments. Condition monitoring assessment means an evaluation of the "as found" condition of the tubing with respect to the performance criteria for structural integrity and accident induced leakage. The "as found" condition refers to the condition of the tubing during an SG inspection outage, as determined from the inservice inspection results or by other means, prior to the plugging of tubes. Condition monitoring assessments shall be conducted during each outage during which the SG tubes are inspected or plugged to confirm that the performance criteria are being met.

## ADMINISTRATIVE CONTROLS

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### STEAM GENERATOR (SG) PROGRAM (Continued)

- b. Performance criteria for SG tube integrity. SG tube integrity shall be maintained by meeting the performance criteria for tube structural integrity, accident induced leakage, and operational leakage.
1. Structural integrity performance criterion: All in-service **SG steam-generator** tubes shall retain structural integrity over the full range of normal operating conditions (including startup, operation in the power range, hot standby, and cool down), all anticipated transients included in the design specification, and design basis accidents. This includes retaining a safety factor of 3.0 against burst under normal steady state full power operation primary to secondary pressure differential and a safety factor of 1.4 against burst applied to the design basis accident primary to secondary pressure differentials. Apart from the above requirements, additional loading conditions associated with the design basis accidents, or combination of accidents in accordance with the design and licensing basis, shall also be evaluated to determine if the associated loads contribute significantly to burst or collapse. In the assessment of tube integrity, those loads that do significantly affect burst or collapse shall be determined and assessed in combination with the loads due to pressure with a safety factor of 1.2 on the combined primary loads and 1.0 on axial secondary loads.
  2. Accident induced leakage performance criterion: The primary to secondary accident induced leakage rate for any design basis accident, other than a SG tube rupture, shall not exceed the leakage rate assumed in the accident analysis in terms of total leakage rate for all SGs and leakage rate for an individual SG. Primary to secondary leakage is not to exceed 540 gpd through any one SG.
  3. The operational leakage performance criterion is specified in LCO 3.4.5.2, "Reactor Coolant System Operational Leakage."
- c. Provisions for SG tube plugging criteria. Tubes found by inservice inspection to contain flaws with a depth equal to or exceeding 40% of the nominal tube wall thickness shall be plugged.

STEAM GENERATOR (SG) PROGRAM (Continued)

- d. Provisions for SG tube inspections. Periodic SG tube inspections shall be performed. The number and portions of the tubes inspected and methods of inspection shall be performed with the objective of detecting flaws of any type (e.g., volumetric flaws, axial and circumferential cracks) that may be present along the length of the tube, from the tube-to-tubesheet weld at the tube inlet to the tube-to-tubesheet weld at the tube outlet and that may satisfy the applicable tube plugging criteria. The tube-to-tubesheet weld is not part of the tube. In addition to meeting the requirements of d.1, d.2, and d.3 below, the inspection scope, inspection methods, and inspection intervals shall be such as to ensure that SG tube integrity is maintained until the next SG inspection. A degradation assessment shall be performed to determine the type and location of flaws to which the tubes may be susceptible and, based on this assessment, to determine which inspection methods need to be employed and at what locations.
1. Inspect 100% of the tubes in each SG during the first refueling outage following SG installation.
  2. After the first refueling outage following SG installation, inspect **100% of the tubes in each SG at least every 9672 effective full power months, which defines the inspection period.** ~~or at least every third refueling outage (whichever results in more frequent inspections). In addition, the minimum number of tubes inspected at each scheduled inspection shall be the number of tubes in all SGs divided by the number of SG inspection outages scheduled in each inspection period as defined in a, b, c and d below. If a degradation assessment indicates the potential for a type of degradation to occur at a location not previously inspected with a technique capable of detecting this type of degradation at this location and that may satisfy the applicable tube repair criteria, the minimum number of locations inspected with such a capable inspection technique during the remainder of the inspection period may be prorated. The fraction of locations to be inspected for this potential type of degradation at this location at the end of the inspection period shall be no less than the ratio of the number of times the SG is scheduled to be inspected in the inspection period after the determination that a new form of degradation could potentially be occurring at this location divided by the total number of times the SG is scheduled to be inspected in the inspection period. Each inspection period defined below may be extended up to 3 effective full power months to include a SG inspection outage in an inspection period and the subsequent inspection period begins at the conclusion of the included SG inspection outage.~~
    - a) ~~After the first refueling outage following SG installation, inspect 100% of the tubes during the next 144 effective full power months. This constitutes the first inspection period;~~
    - b) ~~During the next 120 effective full power months, inspect 100% of the tubes. This constitutes the second inspection period;~~



## ADMINISTRATIVE CONTROLS

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### STEAM GENERATOR (SG) PROGRAM (Continued)

- c) ~~During the next 96 effective full power months, inspect 100% of the tubes. This constitutes the third inspection period; and~~
  - d) ~~During the remaining life of the SGs, inspect 100% of the tubes every 72 effective full power months. This constitutes the fourth and subsequent inspection periods.~~
3. If crack indications are found in any SG tube, then the next inspection for each affected and potentially affected SG for the degradation mechanism that caused the crack indication shall **be at the next** ~~not exceed 24 effective full power months or one refueling outage (whichever results in more frequent inspections)~~. If definitive information, such as from examination of a pulled tube, diagnostic non-destructive testing, or engineering evaluation indicates that a crack-like indication is not associated with a crack(s), then the indication need not be treated as a crack.
- e. Provisions for monitoring operational primary to secondary leakage.

## ADMINISTRATIVE CONTROLS

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### ANNUAL REPORTS (Continued)

- (1) Reactor power history starting 48 hours prior to the first sample in which the limit was exceeded;
- (2) Results of the last isotopic analysis for radioiodine performed prior to exceeding the limit, results of analysis while limit was exceeded and results of one analysis after the radioiodine activity was reduced to less than limit. Each result should include date and time of sampling and the radioiodine concentrations;
- (3) Clean-up system flow history starting 48 hours prior to the first sample in which the limit was exceeded;
- (4) Graph of the I-131 concentration and one other radioiodine isotope concentration in microcuries per gram as a function of time for the duration of the specific activity above steady-state level; and
- (5) The time duration when the specific activity of the primary coolant exceeded the radioiodine limit.

#### 6.9.1.5 STEAM GENERATOR TUBE INSPECTION REPORT

A report shall be submitted within 180 days after the initial entry into HOT SHUTDOWN following completion of an inspection performed in accordance with the Specification 6.5.9, "Steam Generator (SG) Program." The report shall include:

- a. The scope of inspections performed on each SG;
- b. The nondestructive examination techniques utilized for tubes with increased degradation susceptibility;**
- c. For each degradation mechanism found:**
  - 1. The nondestructive examination techniques utilized;**
  - 2. The location, orientation (if linear), measured size (if available), and voltage response for each indication. For tube wear at support structures less than 20 percent through-wall, only the total number of indications needs to be reported;**
  - 3. A description of the condition monitoring assessment and results, including the margin to the tube integrity performance criteria and comparison with the margin predicted to exist at the inspection by the previous forward-looking tube integrity assessment; and**
  - 4. The number of tubes plugged during the inspection outage.**

- d. An analysis summary of the tube integrity conditions predicted to exist at the next scheduled inspection (the forward-looking tube integrity assessment) relative to the applicable performance criteria, including the analysis methodology, inputs, and results;**
- ~~b. Degradation mechanisms found,~~
- ~~c. Nondestructive examination techniques utilized for each degradation mechanism,~~
- ~~d. Location, orientation (if linear), and measured sizes (if available) of service induced indications,~~
- ~~e. Number of tubes plugged during the inspection outage for each degradation mechanism,~~
- ef. The number and percentage of tubes plugged to date, and the effective plugging percentage in each **SG** steam generator; and,**
- f. The results of any SG secondary side inspections.**
- ~~g. The results of condition monitoring, including the results of tube pulls and in situ testing.~~

**Enclosure 1, Attachment 4**

**CNRO-2021-0017**

**ANO-1 Revised Technical Specification Pages**

(5 TS Pages Follow)

## 5.0 ADMINISTRATIVE CONTROLS

### 5.5 Programs and Manuals

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#### 5.5.9 Steam Generator (SG) Program

An SG Program shall be established and implemented to ensure that SG tube integrity is maintained. In addition, the SG Program shall include the following:

- a. Provisions for condition monitoring assessments. Condition monitoring assessment means an evaluation of the “as found” condition of the tubing with respect to the performance criteria for structural integrity and accident induced leakage. The “as found” condition refers to the condition of the tubing during an SG inspection outage, as determined from the inservice inspection results or by other means, prior to the plugging of tubes. Condition monitoring assessments shall be conducted during each outage during which the SG tubes are inspected or plugged to confirm that the performance criteria are being met.
- b. Performance criteria for SG tube integrity. SG tube integrity shall be maintained by meeting the performance criteria for tube structural integrity, accident induced leakage, and operational LEAKAGE.
  1. Structural integrity performance criterion: All in-service SG tubes shall retain structural integrity over the full range of normal operating conditions (including startup, operation in the power range, hot standby, and cool down), all anticipated transients included in the design specification, and design basis accidents. This includes retaining a safety factor of 3.0 against burst under normal steady state full power operation primary to secondary pressure differential and a safety factor of 1.4 against burst applied to the design basis accident primary to secondary pressure differentials. Apart from the above requirements, additional loading conditions associated with the design basis accidents, or combination of accidents in accordance with the design and licensing basis, shall also be evaluated to determine if the associated loads contribute significantly to burst or collapse. In the assessment of tube integrity, those loads that do significantly affect burst or collapse shall be determined and assessed in combination with the loads due to pressure with a safety factor of 1.2 on the combined primary loads and 1.0 on axial secondary loads.
  2. Accident induced leakage performance criterion: The primary to secondary accident induced leakage rate for any design basis accident, other than a SG tube rupture, shall not exceed the leakage rate assumed in the accident analysis in terms of total leakage rate for all SGs and leakage rate for an individual SG. Leakage is not to exceed 1 gpm.
  3. The operational LEAKAGE performance criterion is specified in LCO 3.4.13, “RCS Operational LEAKAGE.”

## 5.0 ADMINISTRATIVE CONTROLS

### 5.5 Programs and Manuals

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- c. Provisions for SG tube plugging criteria. Tubes found by inservice inspection to contain flaws with a depth equal to or exceeding 40% of the nominal tube wall thickness shall be plugged.
- d. Provisions for SG tube inspections. Periodic SG tube inspections shall be performed. The number and portions of the tubes inspected and methods of inspection shall be performed with the objective of detecting flaws of any type (e.g., volumetric flaws, axial and circumferential cracks) that may be present along the length of the tube, from the tube-to-tubesheet weld at the tube inlet to the tube-to-tubesheet weld at the tube outlet, and that may satisfy the applicable tube plugging criteria. The tube-to-tubesheet weld is not part of the tube. In addition to meeting the requirements of d.1, d.2, and d.3 below, the inspection scope, inspection methods, and inspection intervals shall be such as to ensure that SG tube integrity is maintained until the next SG inspection. A degradation assessment shall be performed to determine the type and location of flaws to which the tubes may be susceptible and, based on this assessment, to determine which inspection methods need to be employed and at what locations.
  - 1. Inspect 100% of the tubes in each SG during the first refueling outage following SG installation.
  - 2. After the first refueling outage following SG installation, inspect 100% of the tubes in each SG at least every 96 effective full power months, which defines the inspection period.
  - 3. If crack indications are found in any SG tube, then the next inspection for each affected and potentially affected SG for the degradation mechanism that caused the crack indication shall be at the next refueling outage. If definitive information, such as from examination of a pulled tube, diagnostic non-destructive testing, or engineering evaluation indicates that a crack-like indication is not associated with a crack(s), then the indication need not be treated as a crack.
- e. Provisions for monitoring operational primary to secondary LEAKAGE.

## 5.0 ADMINISTRATIVE CONTROLS

### 5.5 Programs and Manuals

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#### 5.5.10 Secondary Water Chemistry

This program provides controls for monitoring secondary water chemistry to inhibit SG tube degradation. The program shall include:

- a. Identification of a sampling schedule for the critical variables and control points for these variables;
- b. Identification of the procedures used to measure the values of the critical variables;
- c. Identification of process sampling points;
- d. Procedures for the recording and management of data;
- e. Procedures defining corrective actions for all off control point chemistry conditions; and
- f. A procedure identifying the authority responsible for the interpretation of the data and the sequence and timing of administrative events required to initiate corrective action.

## 5.0 ADMINISTRATIVE CONTROLS

### 5.6 Reporting Requirements

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#### 5.6.6 Reactor Building Inspection Report

Any degradation exceeding the acceptance criteria of the containment structure detected during the tests required by the Containment Inspection Program shall undergo an engineering evaluation within 60 days of the completion of the inspection surveillance. The results of the engineering evaluation shall be reported to the NRC within an additional 30 days of the time the evaluation is completed. The report shall include the cause of the condition that does not meet the acceptance criteria, the applicability of the conditions to the other unit, the acceptability of the concrete containment without repair of the item, whether or not repair or replacement is required and, if required, the extent, method, and completion date of necessary repairs, and the extent, nature, and frequency of additional examinations.

#### 5.6.7 Steam Generator Tube Inspection Report

A report shall be submitted within 180 days after the initial entry into MODE 4 following completion of an inspection performed in accordance with the Specification 5.5.9, "Steam Generator (SG) Program." The report shall include:

- a. The scope of inspections performed on each SG;
- b. The nondestructive examination techniques utilized for tubes with increased degradation susceptibility;
- c. For each degradation mechanism found:
  1. The nondestructive examination techniques utilized;
  2. The location, orientation (if linear), measured size (if available), and voltage response for each indication. For tube wear at support structures less than 20 percent through-wall, only the total number of indications needs to be reported;
  3. A description of the condition monitoring assessment and results, including the margin to the tube integrity performance criteria and comparison with the margin predicted to exist at the inspection by the previous forward-looking tube integrity assessment; and
  4. The number of tubes plugged during the inspection outage.
- d. An analysis summary of the tube integrity conditions predicted to exist at the next scheduled inspection (the forward-looking tube integrity assessment) relative to the applicable performance criteria, including the analysis methodology, inputs, and results;



- e. The number and percentage of tubes plugged to date, and the effective plugging percentage in each SG; and
  - f. The results of any SG secondary side inspections.
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**Enclosure 1, Attachment 5**

**CNRO-2021-0017**

**ANO-2 Revised Technical Specification Pages**

(5 TS Pages Follow)

6.5.9 Steam Generator (SG) Program

An SG Program shall be established and implemented to ensure that SG tube integrity is maintained. In addition, the SG Program shall include the following:

- a. Provisions for condition monitoring assessments. Condition monitoring assessment means an evaluation of the "as found" condition of the tubing with respect to the performance criteria for structural integrity and accident induced leakage. The "as found" condition refers to the condition of the tubing during an SG inspection outage, as determined from the inservice inspection results or by other means, prior to the plugging of tubes. Condition monitoring assessments shall be conducted during each outage during which the SG tubes are inspected or plugged to confirm that the performance criteria are being met.
- b. Performance criteria for SG tube integrity. SG tube integrity shall be maintained by meeting the performance criteria for tube structural integrity, accident induced leakage, and operational leakage.
  1. Structural integrity performance criterion: All in-service SG tubes shall retain structural integrity over the full range of normal operating conditions (including startup, operation in the power range, hot standby, and cool down), all anticipated transients included in the design specification, and design basis accidents. This includes retaining a safety factor of 3.0 against burst under normal steady state full power operation primary to secondary pressure differential and a safety factor of 1.4 against burst applied to the design basis accident primary to secondary pressure differentials. Apart from the above requirements, additional loading conditions associated with the design basis accidents, or combination of accidents in accordance with the design and licensing basis, shall also be evaluated to determine if the associated loads contribute significantly to burst or collapse. In the assessment of tube integrity, those loads that do significantly affect burst or collapse shall be determined and assessed in combination with the loads due to pressure with a safety factor of 1.2 on the combined primary loads and 1.0 on axial secondary loads.
  2. Accident induced leakage performance criterion: The primary to secondary accident induced leakage rate for any design basis accident, other than a SG tube rupture, shall not exceed the leakage rate assumed in the accident analysis in terms of total leakage rate for all SGs and leakage rate for an individual SG. Leakage is not to exceed 1 gpm through any one SG.
  3. The operational leakage performance criterion is specified in LCO 3.4.6.2, "Reactor Coolant System Operational Leakage."
- c. Provisions for SG tube plugging criteria. Tubes found by inservice inspection to contain flaws with a depth equal to or exceeding 40% of the nominal tube wall thickness shall be plugged.

6.5.9 Steam Generator (SG) Program (continued)

- d. Provisions for SG tube inspections. Periodic SG tube inspections shall be performed. The number and portions of the tubes inspected and methods of inspection shall be performed with the objective of detecting flaws of any type (e.g., volumetric flaws, axial and circumferential cracks) that may be present along the length of the tube, from the tube-to-tubesheet weld at the tube inlet to the tube-to-tubesheet weld at the tube outlet, and that may satisfy the applicable tube plugging criteria. The tube-to-tubesheet weld is not part of the tube. In addition to meeting the requirements of d.1, d.2, and d.3 below, the inspection scope, inspection methods, and inspection intervals shall be such as to ensure that SG tube integrity is maintained until the next SG inspection. A degradation assessment shall be performed to determine the type and location of flaws to which the tubes may be susceptible and, based on this assessment, to determine which inspection methods need to be employed and at what locations.
1. Inspect 100% of the tubes in each SG during the first refueling outage following SG installation.
  2. After the first refueling outage following SG installation, inspect 100% of the tubes in each SG at least every 96 effective full power months, which defines the inspection period.
  3. If crack indications are found in any SG tube, then the next inspection for each affected and potentially affected SG for the degradation mechanism that caused the crack indication shall be at the next refueling outage. If definitive information, such as from examination of a pulled tube, diagnostic non-destructive testing, or engineering evaluation indicates that a crack-like indication is not associated with a crack(s), then the indication need not be treated as a crack.
- e. Provisions for monitoring operational primary to secondary leakage.

### 6.5.10 Secondary Water Chemistry

This program provides controls for monitoring secondary water chemistry to inhibit SG tube degradation. The program shall include:

- a. Identification of a sampling schedule for the critical variables and control points for these variables;
- b. Identification of the procedures used to measure the values of the critical variables;
- c. Identification of process sampling points;
- d. Procedure for the recording and management of data;
- e. Procedures defining corrective actions for all off control point chemistry conditions; and
- f. A procedure identifying the authority responsible for the interpretation of the data, and the sequence and timing of administrative events required to initiate corrective action.

6.6.6 Containment Inspection Report

Any degradation exceeding the acceptance criteria of the containment structure detected during the tests required by the Containment Tendon Surveillance Program shall undergo an engineering evaluation within 60 days of the completion of the inspection surveillance. The results of the engineering evaluation shall be reported to the NRC within an additional 30 days of the time the evaluation is completed. The report shall include the cause of the condition that does not meet the acceptance criteria, the applicability of the conditions to the other unit, the acceptability of the concrete containment without repair of the item, whether or not repair or replacement is required and, if required, the extent, method, and completion date of necessary repairs, and the extent, nature, and frequency of additional examinations.

6.6.7 Steam Generator Tube Inspection Report

A report shall be submitted within 180 days after the initial entry into HOT SHUTDOWN following completion of an inspection performed in accordance with the Specification 6.5.9, "Steam Generator (SG) Program." The report shall include:

- a. The scope of inspections performed on each SG;
- b. The nondestructive examination techniques utilized for tubes with increased degradation susceptibility;
- c. For each degradation mechanism found:
  1. The nondestructive examination techniques utilized;
  2. The location, orientation (if linear), measured size (if available), and voltage response for each indication. For tube wear at support structures less than 20 percent through-wall, only the total number of indications needs to be reported;
  3. A description of the condition monitoring assessment and results, including the margin to the tube integrity performance criteria and comparison with the margin predicted to exist at the inspection by the previous forward-looking tube integrity assessment; and
  4. The number of tubes plugged during the inspection outage.
- d. An analysis summary of the tube integrity conditions predicted to exist at the next scheduled inspection (the forward-looking tube integrity assessment) relative to the applicable performance criteria, including the analysis methodology, inputs, and results;
- e. The number and percentage of tubes plugged to date, and the effective plugging percentage in each SG; and
- f. The results of any SG secondary side inspections.

6.6.8 Specific Activity

The results of specific activity analysis in which the primary coolant exceeded the limits of Specification 3.4.8. The following information shall be included: (1) Reactor power history starting 48 hours prior to the first sample in which the limit was exceeded; (2) Results of the last isotopic analysis for radioiodine performed prior to exceeding the limit, results of analysis while limit was exceeded the results of one analysis after the radioiodine activity was reduced to less than limit. Each result should include date and time of sampling and the radioiodine concentrations; (3) Clean-up system flow history starting 48 hours prior to the first sample in which the limit was exceeded; (4) Graph of the I-131 concentration and one other radioiodine isotope concentration in microcuries per gram as a function of time for the duration of the specific activity above the steady-state level; and (5) The time duration when the specific activity of the primary coolant exceeded the radioiodine limit.

**Enclosure 1, Attachment 6**

**CNRO-2021-0017**

**Waterford 3 Revised Technical Specification Pages**

(4 TS Pages Follow)



## ADMINISTRATIVE CONTROLS

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### 6.5.8 DELETED

### 6.5.9 STEAM GENERATOR (SG) PROGRAM

An SG Program shall be established and implemented to ensure that SG tube integrity is maintained. In addition, the SG Program shall include the following:

- a. Provisions for condition monitoring assessments. Condition monitoring assessment means an evaluation of the "as found" condition of the tubing with respect to the performance criteria for structural integrity and accident induced leakage. The "as found" condition refers to the condition of the tubing during an SG inspection outage, as determined from the inservice inspection results or by other means, prior to the plugging of tubes. Condition monitoring assessments shall be conducted during each outage during which the SG tubes are inspected or plugged to confirm that the performance criteria are being met.
- b. Performance criteria for SG tube integrity. SG tube integrity shall be maintained by meeting the performance criteria for tube structural integrity, accident induced leakage, and operational leakage.
  1. Structural integrity performance criterion: All in-service SG tubes shall retain structural integrity over the full range of normal operating conditions (including startup, operation in the power range, hot standby, and cool down), all anticipated transients included in the design specification, and design basis accidents. This includes retaining a safety factor of 3.0 against burst under normal steady state full power operation primary to secondary pressure differential and a safety factor of 1.4 against burst applied to the design basis accident primary to secondary pressure differentials. Apart from the above requirements, additional loading conditions associated with the design basis accidents, or combination of accidents in accordance with the design and licensing basis, shall also be evaluated to determine if the associated loads contribute significantly to burst or collapse. In the assessment of tube integrity, those loads that do significantly affect burst or collapse shall be determined and assessed in combination with the loads due to pressure with a safety factor of 1.2 on the combined primary loads and 1.0 on axial secondary loads.
  2. Accident induced leakage performance criterion: The primary to secondary accident induced leakage rate for any design basis accident, other than a SG tube rupture, shall not exceed the leakage rate assumed in the accident analysis in terms of total leakage rate for all SGs and leakage rate for an individual SG. Primary to secondary leakage is not to exceed 540 gpd through any one SG.
  3. The operational leakage performance criterion is specified in LCO 3.4.5.2, "Reactor Coolant System Operational Leakage."
- c. Provisions for SG tube plugging criteria. Tubes found by inservice inspection to contain flaws with a depth equal to or exceeding 40% of the nominal tube wall thickness shall be plugged.

## ADMINISTRATIVE CONTROLS

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### STEAM GENERATOR (SG) PROGRAM (Continued)

- d. Provisions for SG tube inspections. Periodic SG tube inspections shall be performed. The number and portions of the tubes inspected and methods of inspection shall be performed with the objective of detecting flaws of any type (e.g., volumetric flaws, axial and circumferential cracks) that may be present along the length of the tube, from the tube-to-tubesheet weld at the tube inlet to the tube-to-tubesheet weld at the tube outlet and that may satisfy the applicable tube plugging criteria. The tube-to-tubesheet weld is not part of the tube. In addition to meeting the requirements of d.1, d.2, and d.3 below, the inspection scope, inspection methods, and inspection intervals shall be such as to ensure that SG tube integrity is maintained until the next SG inspection. A degradation assessment shall be performed to determine the type and location of flaws to which the tubes may be susceptible and, based on this assessment, to determine which inspection methods need to be employed and at what locations.
1. Inspect 100% of the tubes in each SG during the first refueling outage following SG installation.
  2. After the first refueling outage following SG installation, inspect 100% of the tubes in each SG at least every 96 effective full power months, which defines the inspection period.
  3. If crack indications are found in any SG tube, then the next inspection for each affected and potentially affected SG for the degradation mechanism that caused the crack indication shall be at the next refueling outage. If definitive information, such as from examination of a pulled tube, diagnostic non-destructive testing, or engineering evaluation indicates that a crack-like indication is not associated with a crack(s), then the indication need not be treated as a crack.
- e. Provisions for monitoring operational primary to secondary leakage.

## ADMINISTRATIVE CONTROLS

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### ANNUAL REPORTS (Continued)

- (1) Reactor power history starting 48 hours prior to the first sample in which the limit was exceeded;
- (2) Results of the last isotopic analysis for radioiodine performed prior to exceeding the limit, results of analysis while limit was exceeded and results of one analysis after the radioiodine activity was reduced to less than limit. Each result should include date and time of sampling and the radioiodine concentrations;
- (3) Clean-up system flow history starting 48 hours prior to the first sample in which the limit was exceeded;
- (4) Graph of the I-131 concentration and one other radioiodine isotope concentration in microcuries per gram as a function of time for the duration of the specific activity above steady-state level; and
- (5) The time duration when the specific activity of the primary coolant exceeded the radioiodine limit.

### 6.9.1.5 STEAM GENERATOR TUBE INSPECTION REPORT

A report shall be submitted within 180 days after the initial entry into HOT SHUTDOWN following completion of an inspection performed in accordance with the Specification 6.5.9, "Steam Generator (SG) Program." The report shall include:

- a. The scope of inspections performed on each SG;
- b. The nondestructive examination techniques utilized for tubes with increased degradation susceptibility;
- c. For each degradation mechanism found:
  1. The nondestructive examination techniques utilized;
  2. The location, orientation (if linear), measured size (if available), and voltage response for each indication. For tube wear at support structures less than 20 percent through-wall, only the total number of indications needs to be reported;
  3. A description of the condition monitoring assessment and results, including the margin to the tube integrity performance criteria and comparison with the margin predicted to exist at the inspection by the previous forward-looking tube integrity assessment; and
  4. The number of tubes plugged during the inspection outage.

## ADMINISTRATIVE CONTROLS

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- d. An analysis summary of the tube integrity conditions predicted to exist at the next scheduled inspection (the forward-looking tube integrity assessment) relative to the applicable performance criteria, including the analysis methodology, inputs, and results;
- e. The number and percentage of tubes plugged to date, and the effective plugging percentage in each SG; and
- f. The results of any SG secondary side inspections.

**Enclosure 2**

**CNRO-2021-0017**

**List of Regulatory Commitments**

**LIST OF REGULATORY COMMITMENTS**

This table identifies actions discussed in this letter for which Entergy commits to perform. Any other actions discussed in this submittal are described for the NRC's information and are **not** commitments.

COMMITMENT	TYPE (Check one)		SCHEDULED COMPLETION DATE (If Required)
	ONE-TIME ACTION	CONTINUING COMPLIANCE	
The ANO 1 initial inspection period described in the SG Program, paragraph d.2, began in April 2021. Entergy will submit a SG Tube Inspection Report meeting the revised TS 5.6.7 requirements.	<b>X</b>		Within 30 days after implementation of the license amendment.
The ANO 2 initial inspection period described in the SG Program, paragraph d.2, began in October 2018. Entergy will submit a SG Tube Inspection Report meeting the revised TS 6.6.7 requirements,	<b>X</b>		Within 30 days after implementation of the license amendment.
The Waterford 3 initial inspection period described in the SG Program, paragraph d.2, began in May 2017. Entergy will submit a SG Tube Inspection Report meeting the revised TS 6.9.1.5 requirements.	<b>X</b>		Within 30 days after implementation of the license amendment.