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A Duke Energy Company

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February 19, 2003

U. S. Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555

Subject: Duke Energy Corporation
Oconee Nuclear Station, Units 1, 2, and 3
Docket Nos. 50-269, 50-270, 50-287
Proposed Amendment to the Renewed Facility Operating License and Technical Specifications for Steam Generator Replacement (TSCR 2002-01)

Duke Energy Corporation (Duke) hereby submits a license amendment request (LAR) for the Oconee Nuclear Station Facility Operating License (FOL) and Technical Specifications (TS) pursuant to 10 CFR 50.90. This amendment applies to TS 5.5.10, Steam Generator (SG) Tube Surveillance Program. This request proposes to relocate the existing TS 5.5.10 program requirements applicable to the original SGs to TS 5.5.21, and to provide a new TS 5.5.10 that provides program requirements applicable to the replacement SGs when they are installed. The new TS 5.5.10 program would delete SG repair methods and make other clarifications that are needed to make the new TS consistent with the replacement SGs. Once the original SGs are replaced for all three units, TS Section 5.5.21 will be obsolete and will be deleted by a future LAR.

The changes are proposed since SG repair methods addressed in the existing TS 5.5.10 will not be applicable to the replacement SGs. These repair methods, tube sleeving and tube rerolling, were justified based on the specific tubing material (Inconel 600) in the original SGs. The replacement SGs will incorporate a different tubing material (Alloy 690 TT) for which the current SG tube repair methods have not been evaluated or approved. Additionally: the following TS 5.5.10 changes are proposed:

1. A change to all volatile water is removed since the replacement SGs will be operated on all volatile water treatment. And,

2. The references to inspection requirements for SG tubes in the tube lane are removed since the replacement SGs do not have a tube lane.

The contents of this amendment package are as follows:

- Attachment 1 provides a marked copy of the current TS showing the proposed changes,
- Attachment 2 provides a Description of the Proposed Changes and Technical Justification,

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- Attachment 3 documents the determination that the amendment contains No Significant Hazards Considerations per 10CFR50.92, and
- Attachment 4 provides the basis for the categorical exclusion from performing an Environmental Assessment/Impact Statement per 10CFR51.22(c)(9).

Due to the size of TS Section 5.0 and the potential for the review of this and other LARs to affect proposed replacement TS pages, replacement TS pages will be provided in the later stages of review.

Approval of this amendment request for the Oconee FOL and TSs will not impact the Oconee Updated Final Safety Analysis Report (UFSAR). However, replacement of the Oconee steam generators will impact the UFSAR. Such changes will be made in accordance with 10CFR50.71(e).

Duke has been a participant in the NEI-97-06, Steam Generator Program Guidelines effort. If the NRC approves a Generic License Change package, it would obviate the need for the attached LAR. Since the timing of the Generic License Change Package is uncertain, the attached Oconee-specific LAR is requested to support steam generator replacement.

NRC approval of this LAR is requested by September 1, 2003. The SG replacement outages for Oconee Units 1, 2, and 3 are scheduled for Fall 2003, Spring 2004, and Fall 2004, respectively. A 60-day implementation period is requested.

In accordance with Duke administrative procedures and the Quality Assurance Program Topical Report, this proposed amendment has been reviewed and approved by the Oconee Plant Operations Review Committee and the Duke Corporate Nuclear Safety Review Board.

Pursuant to 10CFR50.91, a copy of this proposed amendment is being sent to the State of South Carolina.

Inquiries about this matter should be directed to Robert Sharpe at (704) 805-2007 or Robert Douglas at (864) 885-3073.

Very truly yours,

R. A. Jones, Vice-President
Oconee Nuclear Site

Attachments

cc: (w/attachments)

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AFFIDAVIT

R. A. Jones, states that he is Vice-President, Oconee Nuclear Station, Duke Energy Corporation, that he is authorized on the part of said Company to sign and file with the U. S. Nuclear Regulatory Commission this amendment to the Oconee Nuclear Station Facility Operating Licenses Nos. DPR-38, DPR-47, and DPR-55 and Technical Specifications; and that all statements and matters set forth herein are true and correct to the best of his knowledge.

R. A. Jones, Vice-President
Oconee Nuclear Station

Subscribed and sworn to before me: 2-19-03
Date

Connie M Breazeale
Notary Public

My Commission Expires:

12-19-12
Date

SEAL

Nuclear Regulatory Commission
February 19, 2003

ATTACHMENT 1

Mark-up of Original TS Pages

5.5 Programs and Manuals

5.5.9 Inservice Testing Program (continued)

ASME Boiler and Pressure Vessel Code and applicable Addenda terminology for inservice testing activities	Required Frequencies for performing inservice testing activities
Weekly	At least once per 7 days
Monthly	At least once per 31 days
Quarterly or every 3 months	At least once per 92 days
Semiannually or every 6 months	At least once per 184 days
Every 9 months	At least once per 276 days
Yearly or annually	At least once per 366 days
Biennially or every 2 years	At least once per 731 days

b. The provisions of SR 3.0.2 are applicable to the above required Frequencies for performing inservice testing activities;

c. The provisions of SR 3.0.3 are applicable to inservice testing activities; and

d. Nothing in the ASME Boiler and Pressure Vessel Code shall be construed to supersede the requirements of any TS.

5.5.10 Steam Generator (SG) Tube Surveillance Program

This program provides the controls for SG tube surveillance. The program shall include the following:

a. Examination Methods

Inservice inspection of steam generator tubing shall include non-destructive examination by eddy-current testing or other equivalent techniques. The inspection equipment shall provide a sensitivity that will detect defects with a penetration of 20 percent or more of the minimum allowable as-manufactured tube wall thickness.

NOTE

APPLICABLE ON EACH UNIT AFTER STEAM GENERATOR REPLACEMENT.

5.5 Programs and Manuals

5.5.10 Steam Generator (SG) Tube Surveillance Program (continued)

b. Acceptance Criteria

PLUGGING

The steam generator shall be considered operable after completion of the specified actions. All tubes examined exceeding the ~~repair~~ limit shall be ~~repaired by sleeving or rerolling or~~ removed from service (e.g., plugged, stabilized).

~~For Units 1 and 3, there are a number of steam generator tubes which exceed the tube repair limit as a result of tube end anomalies. These tubes are temporarily exempted from the requirements for sleeving, rerolling or removal from service, until repaired during or before the next Unit 1 and Unit 3 refueling outages (Unit 1 EOC 18, Unit 3 EOC 17 refueling outages, respectively). An analysis has been performed which confirms the operability of Units 1 and 3 will not be impacted with these tubes in service until the next refueling outage on each of these units.~~

c. Selection and Testing

The steam generator tube minimum sample size, inspection result classification, and the corresponding action required shall be as specified in Table 5.5.10-1. The inservice inspection of steam generator tubes shall be performed at the frequencies specified in 5.5.10.d and the inspected tubes shall be verified acceptable per 5.5.10.e. The tubes selected for each inservice inspection shall include at least 3% of the total number of tubes in both steam generators, with one or both steam generators being inspected. The tubes selected for these inspections shall be selected on a random basis except:

1. The first sample inspection during each inservice inspection of each steam generator shall include:

   a. All tubes that previously had detectable wall penetrations (>20%) and have not been plugged ~~or sleeve repaired in the affected area~~.

   b. At least 50% of the tubes inspected shall be in those areas where experience has indicated potential problems.

   c. A tube adjacent to any selected tube which does not permit passage of the eddy-current probe for tube inspection.

5.5 Programs and Manuals

5.5.10 Steam Generator (SG) Tube Surveillance Program (continued)

2. Tubes in the following Group(s) may be excluded from the first sample if all tubes in a Group in both OTSG are inspected. No credit will be taken for these tubes in meeting minimum sample size requirements.

   Group A-1: Tubes within one, two, or three rows of the open inspection lane.

3. All tubes which have been repaired using the reroll process will have the new roll area inspected during the inservice inspection.

2. 4. The tubes selected as the second and third samples (if required by Table 5.5.10-1) during each inservice inspection may be subjected to less than a full tube inspection provided:

   a. The tubes selected for these samples include the tubes from those areas of the tubesheet array where tubes with imperfections were previously found.

   b. The inspections include those portions of the tubes where imperfections were previously found.

   The results of each sample inspection shall be classified into one of the following three categories:

Category	Inspection Results
C-1	Less than 5% of the total tubes inspected are degraded tubes and none of the inspected tubes are defective.
C-2	One or more tubes, but no more than 1% of the total tubes inspected are defective, or between 5% and 10% of the total tubes inspected are degraded tubes.
C-3	More than 10% of the total tubes inspected are degraded tubes or more than 1% of the inspected tubes are defective.

~~NOTES:~~

NOTE: ~~(1)~~ In all inspections, previously degraded tubes must exhibit significant (>10%) further wall penetrations to be included in the above percentage calculations.

5.5 Programs and Manuals

5.5.10 Steam Generator (SG) Tube Surveillance Program (continued)

(2) Where special inspections are performed pursuant to 5.5.10.c.2, defective or degraded tubes found as a result of the inspection shall be included in determining the Inspection Results Category for that special inspection but need not be included in determining the Inspection Results Category for the general steam generator inspection, unless the mechanism of degradation is random in nature.

(3) Where special inspections are performed pursuant to 5.5.10.c.2, defective or degraded tube indications found in the new roll area as a result of the inspection and any indications found in the originally rolled region of the rerolled tube, need not be included in determining the Inspection Results Category for the general steam generator inspection.

d. Inspection Intervals

The above required inservice inspections of steam generator tubes shall be performed at the following frequencies.

1. Inservice inspections shall be performed at intervals of not less than 12 nor more than 24 calendar months after the previous inspection. If the results of two consecutive inspections ~~following service under all volatile treatment (AVT) conditions~~ fall into the C-1 category or if two consecutive inspections demonstrate that previously observed degradation has not continued and no additional degradation has occurred, the inspection interval may be extended to a maximum of 40 months.

2. If the results of the inservice inspection of a steam generator performed in accordance with Table 5.5.10-1 at 40 month intervals fall in Category C-3, subsequent inservice inspections shall be performed at intervals of not less than 10 months nor more than one fuel cycle after the previous inspection. The increase in inspection frequency shall apply until a subsequent inspection meets the conditions specified in 5.5.10.d.1 and the interval can be extended to a maximum of 40 months.

3. Additional, unscheduled inservice inspections shall be performed on each steam generator in accordance with the first sample inspection specified in Table 5.5.10-1 during the shutdown subsequent to any of the following conditions:

5.5 Programs and Manuals

5.5.10 Steam Generator (SG) Tube Surveillance Program (continued)

a. A seismic occurrence greater than the Operating Basis Earthquake,

b. A loss-of-coolant accident requiring actuation of the engineered safeguards, or

c. A main steam line or feedwater line break.

4. After primary to secondary leakage in excess of the limits of Specification 3.4.13, an inspection of the affected steam generator will be performed in accordance with the following criteria:

a. If the leaking tube is in a Group as defined in Section 5.5.10.c.2, all of the tubes in this Group in this steam generator will be inspected. If the results of this inspection fall into the C-3 category, additional inspections will be performed in the same Group in the other steam generator.

b. If the leaking tube has been repaired by the reroll process and is leaking in the new roll area, all tubes in the steam generator that have been repaired by the reroll process will have the new roll area inspected. If the results of this inspection fall into the C-3 category, additional inspections will be performed in the new roll area in the other steam generator.

c. If the leaking tube is not in a Group as defined in 5.5.10.d.4.a, then an inspection will be performed on the affected steam generator in accordance with Table 5.5.10-1 with an initial inspection sample size of 6% of the tubes in the affected steam generator.

e. Definitions

As used in this specification:

1. Imperfection means an exception to the dimensions, finish or contour of a tube from that required by fabrication drawings or specifications. Eddy-current testing indications below 20% of the nominal tube ~~or sleeve~~ wall thickness, if detectable, may be considered as imperfections.

2. Degradation means a service-induced cracking, wastage, wear or general corrosion occurring on either the inside or outside of a tube ~~or a sleeve~~.

5.5 Programs and Manuals

5.5.10 Steam Generator (SG) Tube Surveillance Program (continued)

3. Degraded Tube means a tube ~~or a sleeve~~ containing imperfections ≥ 20% of the nominal wall thickness caused by degradation.

4. % Degradation means the percentage of the tube ~~or sleeve~~ wall thickness affected or removed by degradation.

5. Defect means an imperfection of such severity that it exceeds the ~~repair~~ PLUGGING limit. A tube ~~or sleeve~~ containing a defect is defective.

6. ~~Repair~~ PLUGGING Limit means the imperfection depth beyond which the tube shall be either removed from service by plugging ~~or repaired by sleeving or rerolling~~ because it may become unserviceable prior to the next inspection; it is equal to 40% of the nominal tube ~~or sleeve~~ wall thickness. ~~Axial tube imperfections of any depth observed between the primary side surface of the tube sheet clad and the end of the tube are excluded from this repair limit.~~

   ~~The Babcock and Wilcox process (or method) equivalent to the method described in report, BAW-1823P, Revision 1 will be used for sleeving repairs.~~

   ~~The new roll area must be free of degradation in order for the repair to be considered acceptable. The rerolling process used by Oconee is described in the Topical Report, BAW-2303P, Revision 4.~~

7. Unserviceable describes the condition of a tube if it leaks or contains a defect large enough to affect its structural integrity in the event of an Operating Basis Earthquake, a loss-of-coolant accident, or a steam line or feedwater line break as specified in 5.5.10.d.

8. Tube Inspection means an inspection of the steam generator tube from the point of entry completely to the point of exit. ~~The degraded tube above the new roll area can be excluded from future periodic inspection requirements because it is no longer part of the pressure boundary once the repair roll is installed.~~

TABLE 5.5.10-1 (Page 1 of 2)
STEAM GENERATOR TUBE INSPECTION

1st Sample Inspection			2nd Sample Inspection		3rd Sample Inspection	
Sample Size	Result	Action Required	Result	Action Required	Result	Action Required
A minimum of S tubes per S G (1)	C-1	None	N/A	N/A	N/A	N/A
	C-2	Plug ~~or repair~~ defective tubes and inspect additional 2S tubes in this SG.	C-1	None	N/A	N/A
			C-2	Plug ~~or repair~~ defective tubes and inspect additional 4S tubes in this SG.	C-1	None
					C-2	Plug ~~or repair~~ defective tubes
					C-3	Plug ~~or repair~~ defective tubes and perform action for C-3 result of 1st Sample
			C-3	Plug ~~or repair~~ defective tubes and perform actions for C-3 results on 1st Sample.	N/A	N/A

(continued)

TABLE 5.5.10-1 (Page 2 of 2)
STEAM GENERATOR TUBE INSPECTION

1st Sample Inspection			2nd Sample Inspection		3rd Sample Inspection	
Sample Size	Result	Action Required	Result	Action Required	Result	Action Required
(continued)	C-3	Inspect 6S tubes in the S.G, plug ~~or repair~~ defective tubes and inspect 2S tubes in the other S.G Perform follow-on inspections in the other S.G. in accordance with results of the above inspection as applied to Table 5.5 10-1 Prompt Notification to NRC pursuant to 10 CFR 50.72	C-1	N/A	N/A	N/A
			C-2	N/A	N/A	N/A
			C-3 (2)	(a) If defects can be localized to an affected area, inspect all tubes in affected area and plug ~~or repair~~ defective tubes (b) If defects cannot be localized to an affected area, inspect all tubes in this S G. and plug ~~or repair~~ defective tubes.	C-1 C-2 C-3	N/A N/A N/A

Notes: (1) S=3(N/n)% Where N is the number of steam generators in the unit, and n is the number of steam generators inspected during an inspection.

(2) Following an 18% random inspection (C-3 category inspection) an unaffected area is identified. The unaffected area will be logically and consistently defined based on generator design, defect location and characteristics The criteria for accepting an area as unaffected depends on the number of defects found in the sample inspected in that area and are established such that there is a 0.05 or smaller probability of accepting the area as unaffected if it contains 30 or more defective tubes.

5.5 Programs and Manuals

5.5.20 Battery Discharge Testing Program (continued)

b. If battery capacity is determined to be < 80% of the manufacturer's rating an OPERABILITY evaluation shall be initiated immediately and completed within the guidelines of the Oconee OPERABILITY program. If the OPERABILITY evaluation determines the battery OPERABLE, battery capacity shall be restored to ≥ 80% of the manufacturer's rating within a time frame commensurate with the safety significance of the issue. Otherwise, the battery shall be declared inoperable and the applicable Condition of Specification 3.8.3 shall be entered.

The provisions of SR 3.0.2 and SR 3.0.3 are applicable to the Battery Discharge Testing Program surveillance frequencies.

INSERT 1 (NEW SECTION 5.5.21)

Insert 1

5.5.21 Steam Generator (SG) Tube Surveillance Program

----------NOTE----------
Applicable on each unit until steam generator replacement.

This program provides the controls for SG tube surveillance. The program shall include the following:

a. Examination Methods

Inservice inspection of steam generator tubing shall include non-destructive examination by eddy-current testing or other equivalent techniques. The inspection equipment shall provide a sensitivity that will detect defects with a penetration of 20 percent or more of the minimum allowable as-manufactured tube wall thickness.

b. Acceptance Criteria

The steam generator shall be considered operable after completion of the specified actions. All tubes examined exceeding the repair limit shall be repaired by sleeving or rerolling or removed from service (e.g., plugged, stabilized).

For Units 1 and 3, there are a number of steam generator tubes which exceed the tube repair limit as a result of tube end anomalies. These tubes are temporarily exempted from the requirements for sleeving, rerolling or removal from service, until repaired during or before the next Unit 1 and Unit 3 refueling outages (Unit 1 EOC 18, Unit 3 EOC 17 refueling outages, respectively). An analysis has been performed which confirms the operability of Units 1 and 3 will not be impacted with these tubes in service until the next refueling outage on each of these units.

c. Selection and Testing

The steam generator tube minimum sample size, inspection result classification, and the corresponding action required shall be as specified in Table 5.5.21-1. The inservice inspection of steam generator tubes shall be performed at the frequencies specified in 5.5.21.d and the inspected tubes shall be verified acceptable per 5.5.21.e. The tubes selected for each inservice inspection shall include at least 3% of the total number of tubes in both steam generators, with one or both steam generators being inspected. The tubes selected for these inspections shall be selected on a random basis except:

1. The first sample inspection during each inservice inspection of each steam generator shall include:

   a. All tubes that previously had detectable wall penetrations (>20%) and have not been plugged or sleeve repaired in the affected area.

Insert 1

b. At least 50% of the tubes inspected shall be in those areas where experience has indicated potential problems.

c. A tube adjacent to any selected tube which does not permit passage of the eddy-current probe for tube inspection.

2. Tubes in the following Group(s) may be excluded from the first sample if all tubes in a Group in both OTSG are inspected. No credit will be taken for these tubes in meeting minimum sample size requirements.

   Group A-1: Tubes within one, two, or three rows of the open inspection lane.

3. All tubes which have been repaired using the reroll process will have the new roll area inspected during the inservice inspection.

4. The tubes selected as the second and third samples (if required by Table 5.5.21-1) during each inservice inspection may be subjected to less than a full tube inspection provided:

   a. The tubes selected for these samples include the tubes from those areas of the tubesheet array where tubes with imperfections were previously found.

   b. The inspections include those portions of the tubes where imperfections were previously found.

   The results of each sample inspection shall be classified into one of the following three categories:

Category	Inspection Results
C-1	Less than 5% of the total tubes inspected are degraded tubes and none of the inspected tubes are defective.
C-2	One or more tubes, but no more than 1% of the total tubes inspected are defective, or between 5% and 10% of the total tubes inspected are degraded tubes.
C-3	More than 10% of the total tubes inspected are degraded tubes or more than 1% of the inspected tubes are defective.

NOTES:

(1) In all inspections, previously degraded tubes must exhibit significant (>10%) further wall penetrations to be included in the above percentage calculations.

(2) Where special inspections are performed pursuant to 5.5.21.c.2, defective or degraded tubes found as a result of the inspection shall be included in determining the Inspection Results Category for that special inspection but

Insert 1

need not be included in determining the Inspection Results Category for the general steam generator inspection, unless the mechanism of degradation is random in nature.

(3) Where special inspections are performed pursuant to 5.5.21.c.2, defective or degraded tube indications found in the new roll area as a result of the inspection and any indications found in the originally rolled region of the rerolled tube, need not be included in determining the Inspection Results Category for the general steam generator inspection.

d. Inspection Intervals

The above required inservice inspections of steam generator tubes shall be performed at the following frequencies.

1. Inservice inspections shall be performed at intervals of not less than 12 nor more than 24 calendar months after the previous inspection. If the results of two consecutive inspections following service under all volatile treatment (AVT) conditions fall into the C-1 category or if two consecutive inspections demonstrate that previously observed degradation has not continued and no additional degradation has occurred, the inspection interval may be extended to a maximum of 40 months.

2. If the results of the inservice inspection of a steam generator performed in accordance with Table 5.5.21-1 at 40 month intervals fall in Category C-3, subsequent inservice inspections shall be performed at intervals of not less than 10 months nor more than one fuel cycle after the previous inspection. The increase in inspection frequency shall apply until a subsequent inspection meets the conditions specified in 5.5.21.d.1 and the interval can be extended to a maximum of 40 months.

3. Additional, unscheduled inservice inspections shall be performed on each steam generator in accordance with the first sample inspection specified in Table 5.5.21-1 during the shutdown subsequent to any of the following conditions:

   a. A seismic occurrence greater than the Operating Basis Earthquake,

   b. A loss-of-coolant accident requiring actuation of the engineered safeguards, or

   c. A main steam line or feedwater line break.

4. After primary to secondary leakage in excess of the limits of Specification 3.4.13, an inspection of the affected steam generator will be performed in accordance with the following criteria:

   a. If the leaking tube is in a Group as defined in Section 5.5.21.c.2, all of the tubes in this Group in this steam generator will be inspected. If

Insert 1

the results of this inspection fall into the C-3 category, additional inspections will be performed in the same Group in the other steam generator.

b. If the leaking tube has been repaired by the reroll process and is leaking in the new roll area, all tubes in the steam generator that have been repaired by the reroll process will have the new roll area inspected. If the results of this inspection fall into the C-3 category, additional inspections will be performed in the new roll area in the other steam generator.

c. If the leaking tube is not in a Group as defined in 5.5.21.d.4.a, then an inspection will be performed on the affected steam generator in accordance with Table 5.5.21-1 with an initial inspection sample size of 6% of the tubes in the affected steam generator.

e. Definitions

As used in this specification:

1. Imperfection means an exception to the dimensions, finish or contour of a tube from that required by fabrication drawings or specifications. Eddy-current testing indications below 20% of the nominal tube or sleeve wall thickness, if detectable, may be considered as imperfections.

2. Degradation means a service-induced cracking, wastage, wear or general corrosion occurring on either the inside or outside of a tube or a sleeve.

3. Degraded Tube means a tube or a sleeve containing imperfections $\geq$ 20% of the nominal wall thickness caused by degradation.

4. % Degradation means the percentage of the tube or sleeve wall thickness affected or removed by degradation.

5. Defect means an imperfection of such severity that it exceeds the repair limit. A tube or sleeve containing a defect is defective.

6. Repair Limit means the imperfection depth beyond which the tube shall be either removed from service by plugging or repaired by sleeving or rerolling because it may become unserviceable prior to the next inspection; it is equal to 40% of the nominal tube or sleeve wall thickness. Axial tube imperfections of any depth observed between the primary side surface of the tube sheet clad and the end of the tube are excluded from this repair limit.

   The Babcock and Wilcox process (or method) equivalent to the method described in report, BAW-1823P, Revision 1 will be used for sleeving repairs.

   The new roll area must be free of degradation in order for the repair to be

Insert 1

considered acceptable. The rerolling process used by Oconee is described in the Topical Report, BAW-2303P, Revision 4.

7. Unserviceable describes the condition of a tube if it leaks or contains a defect large enough to affect its structural integrity in the event of an Operating Basis Earthquake, a loss-of-coolant accident, or a steam line or feedwater line break as specified in 5.5.21.d.

8. Tube Inspection means an inspection of the steam generator tube from the point of entry completely to the point of exit. The degraded tube above the new roll area can be excluded from future periodic inspection requirements because it is no longer part of the pressure boundary once the repair roll is installed.

INSERT 1

TABLE 5.5.21-1 (Page 1 of 2)
STEAM GENERATOR TUBE INSPECTION

1st Sample Inspection			2nd Sample Inspection		3rd Sample Inspection	
Sample Size	Result	Action Required	Result	Action Required	Result	Action Required
A minimum of S tubes per S.G (1)	C-1	None	N/A	N/A	N/A	N/A
	C-2	Plug or repair defective tubes and inspect additional 2S tubes in this SG.	C-1	None	N/A	N/A
			C-2	Plug or repair defective tubes and inspect additional 4S tubes in this SG.	C-1	None
					C-2	Plug or repair defective tubes.
					C-3	Plug or repair defective tubes and perform action for C-3 result of 1st Sample
			C-3	Plug or repair defective tubes and perform actions for C-3 results on 1st Sample.	N/A	N/A

(continued)

INSERT 1

TABLE 5.5.21-1 (Page 2 of 2)
STEAM GENERATOR TUBE INSPECTION

1st Sample Inspection			2nd Sample Inspection		3rd Sample Inspection	
Sample Size	Result	Action Required	Result	Action Required	Result	Action Required
(continued)	C-3	Inspect 6S tubes in the S G, plug or repair defective tubes and inspect 2S tubes in the other S G. Perform follow-on inspections in the other S G. in accordance with results of the above inspection as applied to Table 5.5 21-1 Prompt Notification to NRC pursuant to 10 CFR 50.72	C-1	N/A	N/A	N/A
			C-2	N/A	N/A	N/A
			C-3 (2)	(a) If defects can be localized to an affected area, inspect all tubes in affected area and plug or repair defective tubes. (b) If defects cannot be localized to an affected area, inspect all tubes in this S.G. and plug or repair defective tubes.	C-1 C-2 C-3	N/A N/A N/A

Notes: (1) S=3(N/n)% Where N is the number of steam generators in the unit, and n is the number of steam generators inspected during an inspection

(2) Following an 18% random inspection (C-3 category inspection) an unaffected area is identified. The unaffected area will be logically and consistently defined based on generator design, defect location and characteristics The criteria for accepting an area as unaffected depends on the number of defects found in the sample inspected in that area and are established such that there is a 0 05 or smaller probability of accepting the area as unaffected if it contains 30 or more defective tubes.

Nuclear Regulatory Commission
February 19, 2003

ATTACHMENT 2

Description of the Proposed Change and Technical Justification

1.0 Introduction

This License Amendment Request (LAR) proposes to relocate the existing Technical Specification (TS) 5.5.10, Steam Generator Tube Surveillance Program that is applicable to the original Steam Generators (SG) to new TS 5.5.21. Also proposed is a replacement SG tube surveillance program, TS 5.5.10, that would be consistent with the replacement steam generators scheduled to be installed in Oconee Units 1, 2, and 3 in Fall 2003, Spring 2004, and Fall 2004, respectively.

No changes to the Oconee Updated Final Safety Analysis Report are anticipated as a direct result of this LAR. However, as a result of steam generator replacement, it will be necessary to revise Updated Final Safety Analysis (UFSAR) Chapters 1, 2, 3, 5, 6, 7, 10, and 15. These changes will be made in accordance with 10CFR50.71 (e).

2.0 Description

The proposed changes will create separate TS for the Original SGs (OSGs) and the Replacement SG (RSGs). The current TS Section 5.5.10 is relocated to new TS Section 5.5.21 and will be applicable to the OSGs prior to their replacement. A clarifying note is added to state that TS Section 5.5.21 is applicable until SG replacement. No substantive changes are proposed for the OSG TS, only re-numbering of paragraphs within Section 5.5.21. Once the OSGs are replaced for all three units, TS Section 5.5.21 will be obsolete and can be deleted by a future LAR.

Changes to the new TS 5.5.10 (for the RSGs) are proposed that will delete repair methods and their technical bases that are not valid for the RSGs including references to steam generator tube sleeving and tube reroll repair methods. These repair methods are not applicable to the RSGs due to differences in SG tube material. Additionally, the RSG does not have an open tube lane. Therefore the special inspection group for the open tube lane is deleted. Other changes to the new 5.5.10 include:

- Addition of a note that indicates that the TS is applicable only following steam generator replacement on the respective unit.
- TS Section 5.5.10(b) is revised to change "repair limit" to "plugging limit" and to delete references to sleeving and reroll repairs. The second paragraph is deleted in its entirety.
- TS Section 5.5.10(c)(1)(a) is revised to delete references to sleeve repair.

- TS Section 5.5.10(c)(2) is deleted in its entirety.
- TS Section 5.5.10(c)(3) is deleted in its entirety. The second and third notes are deleted.
- TS Section 5.5.10(d)(1) is revised to delete the reference to the change to all volatile water treatment (AVT) conditions.
- TS Section 5.5.10(d)(4) is revised to delete criteria (a) and (b); (c) is redesignated (a).
- TS Section 5.5.10(e)(1) is revised to delete sleeving.
- TS Section 5.5.10(e)(2) is revised to delete sleeving.
- TS Section 5.5.10(e)(3) is revised to delete sleeving.
- TS Section 5.5.10(e)(4) is revised to delete sleeving.
- TS Section 5.5.10(e)(5) is revised to delete sleeving.
- TS Section 5.5.10(e)(6) is revised to delete discussions of sleeving and reroll as repair methods. "Repair Limit" is changed to "Plugging Limit".
- TS Section 5.5.10(e)(8) is revised to delete reference to reroll as a repair method.
- Table 5.5.10-1 - References to tube "repair" are deleted.

3.0 Background

3.1 Oconee Steam Generators

The SGs in service at Oconee are approaching the end of their useful life. Tube degradation levels are approaching limits imposed by the accident analysis assumptions in UFSAR Chapter 15, Accident Analysis. Therefore, these SGs are scheduled to be replaced with near-identical SGs designed and manufactured by Babcock & Wilcox Canada. A number of design improvements have been incorporated in the replacement SGs. The major differences between the RSGs and the OSGs include the following:

- Tubing is Alloy 690 TT instead of Inconel 600.
- Shell is of higher strength steel that allows for a thinner shell.
- Tubesheet is of higher strength steel that allows for a thinner tubesheet.
- RSG dry weight is decreased by 103 tons.
- Tube freelane is eliminated increasing the number of tubes by 100 (~0.6%).
- Tube surface area is increased by 1632 ft^2 (~1.2%).
- Primary System volume is increased by 16.5 ft^3 (<1%).
- Steam outlet flow restrictors are added.

The reference to AVT that is being removed is an artifact from earlier SG model TSs that were applicable to other reactor system vendors and inadvertently included in the Oconee TSs. The OSGs have always been operated with AVT as will the RSGs.

The RSG design is intended to improve the operation, maintainability, and accident tolerance of the SGs. There are no changes to the physical interfaces with the reactor coolant system, main steam, feedwater, or other connected systems. Normal operating conditions and plant transients have been reviewed and reanalyzed as necessary for the RSGs. The RSGs are therefore nearly identical to the OSGs in design and expected operation, the replacement of the Oconee SGs can be accomplished under 10 CFR 50.59, 10 CFR 50.65, and 10 CFR 50.71(e) with the exception of TS Section 5.5.10, Steam Generator (SG) Tube Surveillance Program.

3.2 Steam Generator Surveillance Program

The TSs that were issued as a part of the Oconee Facility Operating Licenses on February 6, 1973, October 6, 1973, and July 19, 1974 for Oconee Units 1, 2, and 3, respectively, did not include a steam generator tube surveillance program. A brief history of the development of the current SG tube inspection program TS is provided below:

> On July 18, 1974, the Atomic Energy Commission transmitted to Duke a copy of Regulatory Guide (RG) 1.83, Inservice Inspection of Pressurized Water Reactor Steam Generator Tubes. Duke was requested to propose an LAR based on this RG. Duke submitted a proposed amendment on August 30, 1974 but withdrew the request on February 27, 1975.
>
> On September 21, 1976, the NRC proposed a model SG surveillance TS (B&W STS) and requested that Duke propose an LAR for Oconee based on the model TS. Duke submitted a proposed amendment on November 30, 1976. This LAR was supplemented on June 21, 1977, January 23, 1979, October 16, 1979, and February 6, 1980. Included in these supplements was a proposal to establish a sub-group of tubes within one, two, or three rows of the open tube lane. The OSG had an open tube lane to facilitate tube bundle inspection. This open tube lane was found to have the unintended consequence of allowing saturated fluid to reach high elevations in the tube free lane that resulted in high tensile stress and tube cracking in the tubes adjacent to the open tube lane. Therefore, tubes within three rows of the open tube lane were identified for separate inspections and were not included in the random inspection of the SG tube bundle. No credit was taken for these tubes in meeting the minimum sample size requirements. On February 22, 1980, the NRC approved Amendment Nos. 80, 80, and 77 for Oconee Units 1, 2, and 3, respectively. These amendments included a new TS 4.17, Steam Generator Tubing Surveillance.
>
> By letter dated January 16, 1986, Duke submitted an LAR that would revise TS 4.17 to allow sleeve repairs of steam generator tubes. The basis of this change was a proprietary methodology (BAW-1823P, Rev. 1) for SGs with Inconel 600 tube material. The requested LAR was approved by the NRC as Amendment Nos. 161, 161, and 158 on September 1, 1987.

By letter dated October 20, 1997, Duke submitted an LAR that would provide for reroll repair of SG tubes in the tube sheet region as an approved repair methodology for SGs with Inconel 600 tube material. The requested LAR was approved by the NRC as Amendment Nos. 227, 227, and 224 on November 21, 1997.

In June 1998, Duke determined that certain repairs had not been implemented in accordance with TS 4.17.2. Enforcement discretion was requested on June 3, 1998, and followed by an LAR to address the issue on June 4, 1998. The TS 4.17.2 LAR added a provision that SG tubes in Units 1 and 3 with tube end anomalies were exempted from repair or plugging until repaired by the end of the next refueling outages. Amendments 230 and 227, for Units 1 and 3, respectively, were approved by the NRC on July 1, 1998.

On October 28, 1997, Duke submitted an LAR to convert the Oconee TS to the Improved Technical Specifications based on NUREG-1430, "Standard Technical Specifications – Babcock and Wilcox Plants", Rev. 1. Section 5.5.9 – Steam Generator (SG) Tube Surveillance Program notes that the licensee's current SG surveillance specification should be relocated to this section. On December 16, 1998, the NRC issued Amendment Nos. 300, 300, and 300 for Oconee Units 1, 2, and 3 that replaced the old custom TS with the Improved TS. The steam generator Tube Surveillance Program was moved to TS 5.5.10 with no change in content from the final custom TS version of Amendments 230, 227, and 227, for Units 1, 2, and 3, respectively.

On November 17, 1999, Duke submitted an LAR to revise the TS 5.5.10(e)(6) the definition of "Repair Limit" for tube end anomalies. Amendment Nos. 308, 308, and 308 were issued on December 3, 1999.

On September 12, 2000, Duke submitted an LAR to revise the requirements for the steam generator tube reroll repair process of TS 5.5.10(e)(6). On December 15, 2000, the NRC approved Amendments 318, 318, and 318 that revised TS 5.5.10(e)(6) and added two new license conditions that are in affect until the steam generators are replaced.

4.0 Technical Justification

The current Steam Generator Tube Surveillance Program, TS 5.5.10 for the OSGs, will be renumbered TS 5.5.21. Its technical content will not change. The OSGs will continue to be operated under the same surveillance requirements. Once the OSGs are replaced in Oconee Units 1, 2, and 3 in 2003 and 2004, TS 5.5.21 will have no further applicability and can be deleted by a future LAR along with the above mentioned license conditions.

TS 5.5.10 will be revised to be applicable to the RSGs. Changes to the initial SG tube surveillance program (Amendment Nos. 80, 80, and 77) that were added by subsequent Amendments (161/161/158, 227/227/224, 230/227/227, 308/308/308, and 318/318/318) will be removed. The revised TS 5.5.10 will reflect the contents of the original TS 4.17 except that the special grouping for the tube free lane tube region will also be deleted as discussed below.

The most pervasive change will be to delete all references to steam generator tube sleeving and reroll repairs. These repair methods were based on methodologies that were developed for Inconel 600 tubing. Since the replacement steam generators have Alloy 690 tubes, the repair methodologies would not be technically valid for the RSGs. If similar repair methods are deemed appropriate in the future, methodologies appropriate to Alloy 690 tubing will need to be developed and submitted for NRC approval via an LAR.

The references to tube end anomalies are also not applicable to the RSGs due to the change from Inconel 600 to Alloy 690 tubing material and different manufacturing processes for tube installation and are deleted. The technical basis for repair of the tube end anomalies will not be applicable to the RSGs and is deleted. The revised acceptance criteria in TS 5.5.10(b) is deleted since it "expired" at the time of the Unit 1 End-of-Cycle (EOC) 18 and Unit 3 EOC-17 outages and is no longer applicable.

The reference to the tubes adjacent to the open tube lane as a special subgroup in TS Section 5.5.10(b) was not in the B&W STS but was included in the original TS Section 4.4.7 at Duke's request. This reference is deleted since the tube free lane has been eliminated in the RSG design, the special inspection grouping for these tubes will not be appropriate for the RSGs.

5.0 Conclusion

The requested changes to TS Section 5.5.10 will delete repair methods that will not be valid for the Oconee replacement steam generators. The resulting SG tube surveillance program will be fully consistent with the B&W Standard Tech Specs. The current steam generators will be operated under the current surveillance program until they are replaced.

Similar TS changes were approved by the NRC for Catawba Unit 1 (Docket no. 50-413) and McGuire Units 1 and 2 (Docket Nos. 50-369 and 50–370) on August 29, 1996 and May 5, 1997, respectively.

6.0 References

1. Letter from Karl R. Goller, USAEC to Austin C. Thies, Duke Power Company, July 18, 1974.

2. Letter from A. C. Thies, Duke Power Company to Angelo Giambusso, USAEC, August 30, 1974.

3. Letter from A. C. Thies, Duke Power Company to Angelo Giambusso, USAEC, February 27, 1975.

4. Letter from A. C. Thies, Duke Power Company to Angelo Giambusso, USAEC, March 27, 1975.

5. Letter from William O. Parker, Jr., Duke Power Company to Roger S. Boyd, September 3, 1975.

6. Letter from A. Schwencer, USNRC to William O. Parker, Jr., Duke Power Company, September 21, 1976.

7. Letter from William O. Parker, Jr., Duke Power Company to Benard C. Rusche, USNRC, November 30, 1976

8. Letter from A. Schwencer, USNRC to William O. Parker, Jr., Duke Power Company, May 5, 1977.

9. Letter from William O. Parker, Jr., Duke Power Company to Edson G. Case, USNRC, June 21, 1977.

10. Letter from William O. Parker, Jr., Duke Power Company to Harold R. Denton, USNRC, January 23, 1979.

11. Letter from William O. Parker, Jr., Duke Power Company to Harold R. Denton, USNRC, October 16, 1979.

12. Letter from W. P. Gammill, USNRC to William O. Parker, Jr., Duke Power Company, January 18, 1980.

13. Letter from William O. Parker, Jr., Duke Power Company to Harold R. Denton, USNRC, February 6, 1980.

14. Letter from Robert W. Reid, USNRC to William O. Parker, Jr., Duke Power Company, February 22, 1980.

15. Letter from William O. Parker, Jr., Duke Power Company to Harold R. Denton, USNRC, July 15, 1980.

16. Letter from John F. Stoltz, USNRC to William O. Parker, Jr., Duke Power Company, March 30, 1981.

17. Letter from Hal B. Tucker, Duke Power Company to Harold R. Denton, USNRC, January 16, 1986.

18. Letter from Helen N. Pastis, USNRC to H. B. Tucker, Duke Power Company, September 1, 1987.

19. Letter from W. R. McCollum, Jr., Duke Energy Corporation to USNRC, October 20, 1997.

20. Letter from David E. LaBarge, USNRC to W. R. McCollum, Duke Energy Corporation, November 21, 1997.

21. Letter from W. R. McCollum, Jr., Duke Energy Corporation to USNRC, June 4, 1998.

22. Letter from David E. LaBarge, USNRC to W. R. McCollum, Duke Energy Corporation, July 1, 1998.

23. Letter from David E. LaBarge, USNRC to W. R. McCollum, Duke Energy Corporation, December 16, 1998.

24. Letter from W. R. McCollum, Jr., Duke Energy Corporation to USNRC, November 17, 1999.

25. Letter from David E. LaBarge, USNRC to W. R. McCollum, Jr., Duke Energy Corporation, December 3, 1999.

26. Letter from W. R. McCollum, Jr., Duke Energy Corporation to USNRC, September 12, 2000.

27. Letter from David E. LaBarge, USNRC to W. R. McCollum, Duke Energy Corporation, December 15, 2000.

Attachment 3

No Significant Hazards Determination

Description of Amendment Request

The amendment request proposes Technical Specification (TS) changes related to the replacement of the current once-thru steam generators (SG) for Oconee Nuclear Station, Units 1, 2, and 3. This request would relocate the current TS 5.5.10, SG Tube Inspection Program, applicable to the original SGs, to the end of TS section 5.5, Administrative Controls, Programs and Manuals. The relocated TS 5.5.10 is applicable to the current SGs until their removal from service. The request also proposes a new TS 5.5.10, SG Tube Inspection Program, that is applicable to replacement SGs following installation in an Oconee unit. The differences between the original and replacement TS 5.5.10 result from differences between the current and replacement SG designs and appropriate repair methodologies.

Determination of No Significant Hazards

Pursuant to 10CFR50.91, Duke has made the determination that this amendment request does not involves a significant hazard by applying the three standards established by the NRC regulations in 10CFR50.92 as described below.

First Standard

The proposed amendment would not involve a significant increase in the probability or consequences of an accident previously evaluated.

The proposed amendment will revise Technical Specification (TS) 5.5.10 to delete and clarify replacement steam generator (SG) surveillance requirements applicable to the replacement of the SGs following their installation. The proposed amendment does not result in any changes to the design or methods of operation of the facility or any of its structures, systems or components (SSC). The SG repair methods that would be deleted are not applicable to the replacement SGs due to the use of improved materials and design. Defects found during future replacement SG tube inspections that exceed the limits in the new TS 5.5.10 will be removed from service by plugging rather than being repaired. The accident analyses and assumptions made in the Updated Final Safety Analysis Report (UFSAR) Chapter 15, Accident Analyses, are not changed as a result of the proposed changes. There are no changes resulting from the new TS 5.5.10 that could affect the function of preventing or mitigating any of these accidents. The proposed change does not increase the likelihood of the malfunction of an SSC that may increase the probability or consequences of an accident. The relocated surveillance requirements for the current steam generators will not change as a result of the proposed TS changes. Therefore, the proposed change will not result in a significant increase in the probability or consequences of an accident previously evaluated.

Second Standard

The proposed amendment would not create the possibility of a new or different kind of accident from any accident previously evaluated.

The proposed changes to the SG tube surveillance TS will delete or modify surveillance requirements that would otherwise not be applicable to the replacement steam generators. SG Tubes found to exceed the plugging limit criteria of TS 5.5.10 for continued service will be removed from service by plugging rather than being repaired. The plugging limit is unchanged by the proposed amendment. These changes will not introduce any adverse changes to the facilities' design bases or postulated accidents resulting from potential tube degradation. The proposed amendment does not affect the design of SGs, their method of operation, or primary coolant chemistry controls. In addition, the proposed amendment does not impact any other SSC. Surveillance requirements for the current SGs will not change prior to their removal from service as a result of the proposed changes. Therefore, the proposed changes do not create the possibility of a new or different type of accident from any accident previously evaluated.

Third Standard

The proposed amendment would not involve a significant reduction in the margin of safety.

Margin of safety is related to the confidence in the ability of the fission product barriers to perform their design functions during and following an accident situation. These barriers include the fuel cladding, the reactor coolant system, and the containment system. These barriers are unaffected by the changes proposed in this LAR. The steam generator tubes are an integral part of the reactor coolant pressure boundary. Repairing SG tubes by previously approved methods of sleeving or rerolling are considered to be an equivalent boundary to plugging a steam generator tube as has also been previously approved. Therefore, the margin of safety is not reduced by the changes proposed in this license amendment request.

Conclusion

Based upon the proceeding evaluation, performed pursuant to 10CFR50.92, Duke Energy Corporation has concluded that approval and implementation of this license amendment request at the Oconee Nuclear Station will not involve a significant hazards consideration. The proposed changes revise the steam generator surveillance requirements to be consistent with the replacement steam generators. Following implementation of the changes proposed in this license amendment request, the Oconee steam generators will continue to be operated in a safe and conservative manner.

ATTACHMENT 4

Environmental Assessment/ Impact Statement

Duke Energy Corporation has determined that operation of the Oconee Nuclear Station with the proposed amendments in place does not involve a significant hazards consideration (as detailed in Attachment 4). Additionally, operation with the proposed amendments will not result in any significant increases in the amounts of any effluents that may be released offsite, nor will there be any significant increases in individual or cumulative occupational radiation exposure. Therefore, the proposed amendments are eligible for categorical exclusion as set forth in 10CFR51.22(c)(9). Consequently, pursuant to 10CFR50.22 (b), it is determined that no environmental impact statement or environmental assessment is needed in connection with the approval of the changes proposed within this license amendment request.