WOLF CREEK
NUCLEAR OPERATING CORPORATION

Terry J Garrett
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February 21, 2006

ET 06-0004

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

Reference: 1) Letter dated April 28, 2005, from J. N. Donohew, USNRC, to R. A. Muench, WCNOC, "Wolf Creek Generating Station – Issuance of Exigent Amendment RE: Steam Generator (SG) Tube Surveillance Program (TAC NO. MC6757)"

2) Letter ET 05-0021, dated November 3, 2005, from T. J. Garrett, WCNOC, to USNRC

Subject: Docket No. 50-482: Revision to Technical Specification 5.5.9, "Steam Generator Tube Surveillance Program"

Gentlemen:

Pursuant to 10 CFR 50.90, Wolf Creek Nuclear Operating Corporation (WCNOC) hereby requests an amendment to Facility Operating License No. NPF-42 for the Wolf Creek Generating Station (WCGS).

WCNOC proposes to revise Technical Specification 5.5.9, "Steam Generator Tube Surveillance Program," to exclude portions of the tube below the top of the tubesheet in the WCGS steam generators from periodic steam generator tube inspections. Application of the structural analysis and leak rate evaluation results to exclude portions of the tube from inspection and/or repair of tube indications is interpreted to constitute a redefinition of the primary-to-secondary pressure boundary. The NRC has previously granted a similar amendment to exclude the portion of the tube below 17 inches from the top of the hot leg tubesheet, on a one-time basis for WCGS, in Reference 1. This change is supported by Westinghouse Electric Company LLC, LTR-CDME-05-209, "Steam Generator Tube Alternate Repair Criteria for the Portion of the Tube Within the Tubesheet at the Wolf Creek Generating Station," dated January 2006.

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Reference 2 proposed an amendment to revise the Technical Specification requirements related to steam generator tube integrity consistent with NRC-approved Revision 4 to Technical Specification Task Force (TSTF) Standard Technical Specification Change Traveler, TSTF-449, "Steam Generator Tube Integrity." This amendment request includes a markup of TS pages based on the incorporation of changes proposed in Reference 2.

Attachments I and II provide the evaluation and markup of current TS pages, respectively, in support of this amendment request. Attachments III through V provide markup of TS pages, proposed TS Bases changes, and retyped TS pages based on the incorporation of changes in Reference 2. Attachment V is provided for information only. Final TS Bases pages will be implemented pursuant to TS 5.5.14, "Technical Specifications (TS) Bases Control Program." Attachment VI contains a list of commitments.

Enclosure I provides the proprietary Westinghouse Electric Company LLC LTR-CDME-05-209-P, "Steam Generator Tube Alternate Repair Criteria for the Portion of the Tube Within the Tubesheet at the Wolf Creek Generating Station." As Enclosure I contains information proprietary to Westinghouse Electric Company LLC, it is supported by an affidavit signed by Westinghouse Electric Company LLC, the owner of the information. The affidavit sets forth the basis on which the information may be withheld from public disclosure by the Commission and addresses with specificity the considerations listed in paragraph (b)(4) of 10 CFR 2.390 of the Commission's regulations. Accordingly, it is respectfully requested that the information, which is proprietary to Westinghouse, be withheld from public disclosure in accordance with 10 CFR 2.390 of the Commission's regulations. This affidavit, along with a Westinghouse authorization letter, CAW-05-2084, "Application for Withholding Proprietary Information from Public Disclosure," is contained in Enclosure III.

Enclosure II provides non-proprietary Westinghouse Electric Company LLC, LTR-CDME-05-209-NP, "Steam Generator Tube Alternate Repair Criteria for the Portion of the Tube Within the Tubesheet at the Wolf Creek Generating Station."

WCNOC requests the proposed change be approved by September 15, 2006, to support the preparations for Refueling Outage 15, which is scheduled to start in October 2006. Once approved, the amendment will be implemented within 90 days and subsequent to the implementation of the amendment for Reference 2.

It has been determined that this amendment application does not involve a significant hazard consideration as determined per 10 CFR 50.92. Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment needs to be prepared in connection with the issuance of this amendment.

The amendment application was reviewed by the Plant Safety Review Committee. In accordance with 10 CFR 50.91, a copy of this amendment application, with attachments, is being provided to the designated Kansas State official.

If you have any questions concerning this matter, please contact me at (620) 364-4084, or Mr. Kevin Moles at (620) 364-4126.

Very truly yours,

Terry J. Garrett

TJG/rlt

Attachments:
- I - Evaluation
- II - Markup of Current Technical Specification Pages
- III - Markup of Technical Specification Pages (based on incorporation of changes associated with TSTF-449, Rev. 4)
- IV - Retyped Technical Specification Pages (based on incorporation of changes associated with TSTF-449, Rev. 4)
- V - Proposed Technical Specification Bases Changes – Information Only (based on incorporation of changes associated with TSTF-449, Rev. 4)
- VI - List of Commitments

Enclosures:
- I - Westinghouse Electric Company LLC LTR-CDME-05-209-P, "Steam Generator Tube Alternate Repair Criteria for the Portion of the Tube Within the Tubesheet at the Wolf Creek Generating Station."
- II - Westinghouse Electric Company LLC LTR-CDME-05-209-NP, "Steam Generator Tube Alternate Repair Criteria for the Portion of the Tube Within the Tubesheet at the Wolf Creek Generating Station."
- III - Westinghouse Electric Company LLC LTR CAW-05-2084, "Application for Withholding Proprietary Information from Public Disclosure."

cc: T. A. Conley (KDHE), w/a, w/e
J. N. Donohew (NRC), w/a, w/e
W. B. Jones (NRC), w/a, w/e
B. S. Mallett (NRC), w/a, w/e
Senior Resident Inspector (NRC), w/a, w/e

STATE OF KANSAS)
) SS
COUNTY OF COFFEY)

Terry J. Garrett, of lawful age, being first duly sworn upon oath says that he is Vice President Engineering of Wolf Creek Nuclear Operating Corporation; that he has read the foregoing document and knows the contents thereof; that he has executed the same for and on behalf of said Corporation with full power and authority to do so; and that the facts therein stated are true and correct to the best of his knowledge, information and belief.

By_______________
Terry J. Garrett
Vice President Engineering

SUBSCRIBED and sworn to before me this 21 day of Feb., 2006.

NOTARY PUBLIC
OFFICIAL SEAL
STATE OF KANSAS
RHONDA L. TIEMEYER
MY COMMISSION EXPIRES
January 11, 2010

Rhonda L. Tiemeyer
Notary Public

Expiration Date January 11, 2010

EVALUATION

1.0 DESCRIPTION

The proposed amendment revises Technical Specification (TS) 5.5.9, "Steam Generator Tube Surveillance Program," to exclude portions of the tube below the top of the tubesheet in the Wolf Creek Generating Station (WCGS) steam generators from periodic steam generator tube inspections. Application of the structural analysis and leak rate evaluation results to exclude portions of the tube from inspection and/or repair of tube indications is interpreted to constitute a redefinition of the primary-to-secondary pressure boundary. The NRC has previously granted a similar amendment to exclude the portion of the tube below 17 inches from the top of the hot leg tubesheet, on a one-time basis for WCGS (Reference 4). This change is supported by Westinghouse Electric Company LLC, LTR-CDME-05-209-P, "Steam Generator Tube Alternate Repair Criteria for the Portion of the Tube Within the Tubesheet at the Wolf Creek Generating Station," dated January 2006 (Reference 2).

2.0 PROPOSED CHANGE

Wolf Creek Nuclear Operating Corporation (WCNOC) proposed an amendment (Reference 1) to revise the Technical Specification requirements related to steam generator tube integrity consistent with NRC-approved Revision 4 to Technical Specification Task Force (TSTF) Standard Technical Specification Change Traveler, TSTF-449, "Steam Generator Tube Integrity," (Reference 7). This amendment request provides a markup of TS pages based on the current Technical Specification (see Attachment II) and markups of TS pages (see Attachment IV) based on the incorporation of changes proposed in Reference 1.

Proposed Changes to Current TSs

- TS 5.5.9b., "Steam Generator Tube Sample Selection and Inspection," is revised to delete item 4.

- TS 5.5.9d.1.f) currently states:

  "Plugging Limit *means the imperfection depth at or beyond which the tube shall be removed from service and is equal to 40% of the nominal tube wall thickness. During Refueling Outage 14 and the subsequent operating cycle, this criterion does not apply to degradation identified in the portion of the tube below 17 inches from the top of the hot leg tubesheet. Degradation found in the portion of the tube below 17 inches from the top of the hot leg tubesheet does not require plugging. During Refueling Outage 14 and the subsequent operating cycle, all tubes with degradation identified in the portion of the tube within the region from the top of the hot leg tubesheet to 17 inches below the top of the tubesheet shall be removed from service;*"

The acceptance criteria would be revised as follows:

> "Plugging Limit means the imperfection depth at or beyond which the tube shall be removed from service and is equal to 40% of the nominal tube wall thickness. For tubes fully expanded into the tubesheet, degradation found in the portion of the tube below the depth identified in Table 5.5.9-3 from the top of the tubesheet does not require plugging. Tubes with degradation identified in the portion of the tube within the region from the top of the tubesheet to the depth identified in Table 5.5.9-3 shall be removed from service;"

- TS 5.5.9d.1.h) currently states:

> "Tube inspection means an inspection of the steam generator tube from the tube end (hot leg side) completely around the U-bend to the top support of the cold leg. During Refueling Outage 14 and the subsequent operating cycle, the portion of the tube below 17 inches from the top of the hot leg tubesheet is excluded;"

The acceptance criteria would be revised as follows:

> "Tube inspection means an inspection of the steam generator tube from the tube end (hot leg side) completely around the U-bend to the top support of the cold leg. For tubes fully expanded into the tubesheet, the portion of the tube below the depth identified in Table 5.5.9-3 from the top of the tubesheet is excluded; and"

- TS 5.5.9d.1.j) is deleted.

- Table 5.5.9-3 is added. This table does not include cold leg depths based on the current definition of tube inspection that excludes the cold leg.

TABLE 5.5.9-3

STEAM GENERATOR TUBE INSPECTION DEPTHS

STEAM GENERATOR HOT LEG					
Inspection Depth Zones	H1	H2	H3	H4	H5
Radius of the Zone from the Vertical Centerline of the Tubesheet (inches)	2.2 - 14	>14 – 24	>24 – 34	>34 – 45	>45 - 59
Depth for the Zone (inches)	7.0	6.4	5.4	4.0	2.7

Proposed Changes to TSTF-449 Markup TS Pages

- TS 5.5.9c.1. states:

  "For Refueling Outage 14 and the subsequent operating cycle, degradation found in the portion of the tube below 17 inches from the top of the hot leg tubesheet does not require plugging."

  The criteria is revised as follows:

  "For tubes fully expanded into the tubesheet, degradation found in the portion of the tube below the depth identified in the below tables from the top of the tubesheet does not require plugging."

STEAM GENERATOR TUBE INSPECTION DEPTHS

STEAM GENERATOR HOT LEG					
Inspection Depth Zones	H1	H2	H3	H4	H5
Radius of the Zone from the Vertical Centerline of the Tubesheet (inches)	2 - 14	>14 – 24	>24 – 34	>34 – 45	>45 - 59
Depth for the Zone (inches)	7.0	6.4	5.4	4.0	2.7

STEAM GENERATOR COLD LEG				
Inspection Depth Zones	C1	C2	C3	C4
Radius of the Zone from the Vertical Centerline of the Tubesheet (inches)	2 - 20	>20 – 30	>30 – 45	>45 – 59
Depth for the Zone (inches)	7.0	6.1	4.8	2.7

- TS 5.5.9d., Provisions for SG tube inspections, third sentence states:

  "For Refueling Outage 14 and the subsequent operating cycle, the portion of the tube below 17 inches from the top of the hot leg tubesheet is excluded."

  This sentence is revised as follows:

  "For tubes fully expanded into the tubesheet, the portion of the tube below the top of the tubesheet identified in c.1 above is excluded."

3.0 BACKGROUND

WCGS is a four loop plant with Model F steam generators having 5626 tubes in each steam generator. A total of 181 tubes are plugged. The design of the steam generators includes Alloy 600 thermally treated tubing, full-depth hydraulically expanded tubesheet

joints, and broached hole quatrefoil tube support plates constructed of stainless steel. To date, the only tube degradation identified in the steam generators is related to tube wear (loose part or anti-vibration bar). No corrosion-related tube degradation mechanisms have been detected.

Indications of cracking were reported at Catawba Nuclear Station, Unit 2, based on the results from the nondestructive, eddy current examination of the steam generator tubes during the fall 2004 outage, as described in NRC Information Notice 2005-09 (Reference 3), "Indications in Thermally Treated Alloy 600 Steam Generator Tubes and Tube-to-Tubesheet Welds." Tube indications were reported approximately seven inches from the top of the hot leg tubesheet in one tube, and just above the tube-to-tubesheet welds in a region of the tube known as the tack expansion in several other tubes. Finally, indications were also reported in the tube-end welds, also known as tube-to-tubesheet welds, joining the tube to the tubesheet.

Catawba Nuclear Station, Unit 2, has Westinghouse designed Model D5 steam generators. Model D5 steam generators were fabricated with Alloy 600TT (i.e., thermally treated) tubes. The WCGS Model F steam generators were also fabricated with Alloy 600TT tubes. Thus, there is a potential for tube indications similar to those reported at Catawba Nuclear Station, Unit 2, within the hot leg tubesheet region to be identified in the WCGS steam generators if similar inspections were to be performed.

Potential inspection plans for the tubes and the welds underwent intensive industry discussions in March 2005. The findings in the Catawba Nuclear Station, Unit 2, steam generator tubes present three distinct issues with regard to the steam generator tubes at WCGS:

1) *indications in internal bulges and overexpansions within the hot leg tubesheet;*
2) indications at the elevation of the tack expansion transition; and
3) indications in the tube-to-tubesheet welds and propagation of these indications into the adjacent tube material.

The steam generator inspection scope is governed by TS 5.5.9, NEI 97-06 (Reference 5), Electric Power Research Institute (EPRI) Steam Generator Examination Guidelines (Reference 6), WCGS procedure AP 29A-003, "Steam Generator Management," and the results of the WCGS steam generator degradation assessment. Criterion IX, "Control of Special Processes" of 10 CFR Part 50, Appendix B, requires in part that nondestructive testing is to be accomplished by qualified personnel using qualified procedures in accordance with the applicable criteria. The inspection techniques and equipment were capable of reliably detecting the known and potential specific degradation mechanisms applicable to WCGS. The inspection techniques, essential variables and equipment were qualified to Appendix H, "Performance Demonstration for Eddy Current Examination," of the EPRI Steam Generator Guidelines.

The most recent WCGS steam generator tube inspection was performed in the April 2005 refueling outage (Refueling Outage 14). The NRC granted on a one-time basis, an amendment (Reference 4) to exclude the portion of the tube below 17 inches from the top of the hot leg tubesheet for Refueling Outage 14 and the subsequent operating cycle. During Refueling Outage 14, WCNOC performed the following additional inspection requirements in steam generators "B" and "C" in order to use the limited hot leg tubesheet inspection methodology:

1. A 55% minimum inspection of the hot leg side tubes using rotating pancake coil probe technology from three inches above the top of the hot leg tubesheet to three inches below the top of the tubesheet.
2. An inspection of sufficient hot leg side tubes to include a minimum 20% sample of the total bulges and overexpansion population between the top of the hot leg tubesheet and 17 inches below the top of the tubesheet. The inspection was performed using rotating pancake coil technology and focused on the area from the top of the hot leg tubesheet to 10 inches below the top of the tubesheet.

These inspections did not identify any indications of cracking.

Prior to each steam generator tube inspection, a degradation assessment, which includes a review of operating experience, is performed to identify degradation mechanisms that may be present. A validation assessment is also performed to verify that the eddy current techniques utilized are capable of detecting those flaw types that are identified in the degradation assessment. Based on operating experience from both WCGS and other plants, WCNOC has revised the steam generator tube inspection plan to include sampling of bulges and overexpansions within the tubesheet region. The sample is based on the guidance contained in EPRI Steam Generator Examination Guidelines and TS 5.5.9. This inspection plan is expanded according to industry guidelines if necessary due to confirmed degradation (i.e., a tube crack).

4.0 TECHNICAL ANALYSIS

In order to preclude unnecessarily plugging tubes in the WCGS steam generators, an evaluation was performed to identify the safety significant portion of the tube within the tubesheet necessary to maintain structural and leakage integrity for both normal operating and accident conditions. Tube inspections will be limited to identifying and plugging degradation in this portion of the tubes. The technical evaluation for the inspection and repair methodology is provided in Westinghouse Electric Company LTR-CDME-05-209-P (Reference 2), "Steam Generator Tube Alternate Repair Criteria for the Portion of the Tube Within the Tubesheet at the Wolf Creek Generating Station." The evaluation is based on the use of finite element model structural analyses and a bounding leak rate evaluation based on the change in contact pressure between the tube and the tubesheet between normal operating and postulated accident conditions. The limited tubesheet inspection criteria were developed for the tubesheet region of the WCGS Model F steam generators considering the most stringent loads associated with plant operation, including transients and postulated accident conditions. The limited tubesheet inspection criteria were selected to prevent tube burst and axial separation due to axial pullout forces acting on the tube and to ensure that the steam line break (SLB) leakage limits are not exceeded. LTR-CDME-05-209-P provides technical justification for limiting the inspection in the tubesheet expansion region to less than full depth of the tubesheet.

Constraint provided by the tubesheet precludes tube burst for cracks within the tubesheet. The criteria for tube burst described in NEI 97-06 are satisfied due to the constraint provided by the tubesheet. Through application of the limited tubesheet inspection scope described herein, the existing operating leakage limit provides assurance that excessive leakage (i.e., greater than accident analysis assumptions) will not occur during a postulated steam line break (SLB) event

The safety significant portion of the tube is the length of tube that is engaged in the tubesheet, measured from the secondary face that is required to maintain structural and leakage integrity over the full range of steam generator operating conditions, including the most limiting accident conditions. The evaluation determined that degradation in tubing below the safety significant portion of the tube does not require plugging and serves as the basis for the tubesheet inspection program.

The basis for determining the safety significant portion of the tube within the tubesheet is based upon evaluation and testing programs that quantified the tube-to-tubesheet radial contact pressure for bounding plant conditions as described in LTR-CDME-05-209-P. The justification includes two necessary parts, a length labeled H* and a second length labeled B*, to satisfy both the structural requirements and the leakage requirements under normal operating conditions and under limiting accident conditions:

> H* addresses the structural requirements. H* defines the minimum length of engagement required for hydraulically expanded tubes to prevent tube pullout from the tubesheet under limiting accident conditions. The principal loads acting to pull a tube from the tubesheet are end-cap loads resulting from the primary to secondary pressure differentials. H* varies with radial position from the tubesheet centerline due to tubesheet bow resulting from the primary-to-secondary pressure differential. The bow increases during accident conditions due to a greater pressure differential across the tubesheet. Increased tubesheet bow causes tube-hole bore dilation above the neutral axis resulting in reduced interface loads between the tube and the tubesheet. Tubesheet bending varies with the radial distance from the centerline of the tubesheet as dictated by the structural constraints of the tubesheet, e.g., shell and support ring, on the outside diameter and divider plate at the centerline.
>
> B* addresses leakage requirements. As defined in Reference 2, B* is the distance from the top of the tubesheet where the leakage flow resistance at SLB conditions equals the leakage flow resistance at the H* distance under normal operating conditions. This definition of B* is useful in that the accident leakage will be equal to the ratio of the accident pressure differential to the normal operating pressure differential times the normal operating leakage. In effect, the normal operating leakage becomes a "bellwether" for the accident leakage; therefore, if normal operating leakage is within acceptable limits, accident induced leakage will also be within acceptable limits.

The WCGS Technical Specifications allowable normal operating leak rate will be 150 gpd (0.1 gpm) after NRC approval of the amendment request (Reference 1) to adopt TSTF-449, Revision 4 (Reference 7). The allowable accident induced leak rate is 1 gpm total in the affected steam generator as specified in WCGS Updated Safety Analysis Report, Table 15.1-3, "Parameters Used in Evaluating the Radiological Consequences of a Main Steam Line Break."

The SLB pressure differential is a factor of 2, or less, greater than the normal operating pressure differential depending on the plugging status of the steam generators. The accident induced primary to secondary pressure differential is never more than a factor of 2 greater than the normal operating primary to secondary pressure differential. Therefore, if the current normal operating leakage is at its limiting value, 0.1 gpm, the accident induced leakage will not exceed 0.2 gpm, a factor of 5, or greater, less than its allowable value if the bounding values of H* and B* are applied.

One tube in Steam Generator B (R11, C121) is not fully expanded in the hot leg. While this alternate repair criteria does not apply to the hot leg portion of the tube (R11, C121) in Steam Generator B, it is adequately inspected with the bobbin coil. The tube end weld will be addressed during future inspections. Inspection techniques and justifications are documented prior to each inspection in the Degradation Assessment. All other tubes in all four steam generators are fully expanded.

For tubes fully expanded into the tubesheet, no tube inspection and repair will be required for the portion of the tube below the depth identified in the below tables from the top of the tubesheet and any defect that does exist below the specified depth does not require plugging.

STEAM GENERATOR HOT LEG					
Inspection Depth Zones	H1	H2	H3	H4	H5
Radius of the Zone from the Vertical Centerline of the Tubesheet (inches)	2 - 14	>14 – 24	>24 – 34	>34 – 45	>45 - 59
Depth for the Zone (inches)	7.0	6.4	5.4	4.0	2.7

STEAM GENERATOR COLD LEG				
Inspection Depth Zones	C1	C2	C3	C4
Radius of the Zone from the Vertical Centerline of the Tubesheet (inches)	2 - 20	>20 – 30	>30 – 45	>45 – 59
Depth for the Zone (inches)	7.0	6.1	4.8	2.7

The safety significant portion of the tube is the length of tube that is engaged in the tubesheet from the secondary face that is required to maintain structural and leakage integrity over the full range of steam generator operating conditions, including the most limiting accident conditions. The evaluation in Enclosure I determined that degradation in the tubing below the safety significant portion of the tube does not require plugging and serves as the bases for the tubesheet inspection program. As such, the inspection and repair program at WCGS provides a high level of confidence that the structural and leakage criteria are maintained during normal operating and accident conditions.

Conclusion

The proposed change defines the region of the tube that must be inspected and repaired. An evaluation has been developed by Westinghouse Electric Company, LLC for this amendment request. This analysis concluded that: 1) the structural integrity of the primary-to-secondary pressure boundary is unaffected by tube degradation of any magnitude below a tube location-specific depth, and 2) the accident condition leak rate integrity is bounded by the normal operating leak rate from degradation at or below a depth, from the top of the tubesheet, including degradation of the tube end welds. Below the more conservative of either H* or B* (whichever is lower), any type of axial or circumferential stress corrosion cracking can be shown to meet all applicable performance criteria.

5.0 REGULATORY ANALYSIS

5.1 No Significant Hazards Consideration

This amendment application proposes to revise Technical Specification (TS) 5.5.9, "Steam Generator Tube Surveillance Program," to exclude the portions of the tube below the top of the tubesheet in the WCGS steam generators from periodic steam generator tube inspections. Application of the structural analysis and leak rate evaluation results, to exclude portions of the tube from inspection and/or repair of tube indications is interpreted to constitute a redefinition of the primary-to-secondary pressure boundary.

The proposed change defines the region of the tube that must be inspected and repaired. A justification has been developed by Westinghouse Electric Company, LLC to identify the specific rotating pancake coil probe inspection depth below which any type of axial or circumferential primary water stress corrosion cracking can be shown to meet Nuclear Energy Institute (NEI) 97-06 (Reference 5), "Steam Generator Program Guidelines," performance criteria.

WCNOC has evaluated whether or not a significant hazards consideration is involved with the proposed amendment 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 previously analyzed accidents are initiated by the failure of plant structures, systems, or components. The proposed change that alters the steam generator inspection criteria does not have a detrimental impact on the integrity of any plant structure, system, or component that initiates an analyzed event. The proposed change will not alter the operation of, or otherwise increase the failure probability of any plant equipment that initiates an analyzed accident.

Of the applicable accidents previously evaluated, the limiting transients with respect to the proposed changes to the steam generator tube inspection criteria, are the steam generator tube rupture (SGTR) event and the steam line break (SLB) accident.

During the SGTR event, the required structural integrity margins of the steam generator tubes will be maintained by the presence of the steam generator tubesheet. Steam generator tubes are hydraulically expanded in the tubesheet area. Tube rupture in tubes with cracks in the tubesheet is precluded by the constraint provided by the tubesheet. This constraint results from the hydraulic expansion process, thermal expansion mismatch between the tube and the tubesheet and from the differential pressure between the primary and secondary side. Based on this design, the structural margins against burst, discussed in Regulatory Guide (RG) 1.121, "Bases for Plugging Degraded PWR Steam Generator Tubes," are maintained for both normal and postulated accident conditions.

The proposed change does not affect other systems, structures, components or operational features. Therefore, the proposed changes result in no significant increase in the probability of the occurrence of a SGTR accident.

At normal operating pressures, leakage from primary water stress corrosion cracking (PWSCC) below the proposed inspection depth is limited by both the tube-to-tubesheet crevice and the limited crack opening permitted by the tubesheet constraint. Consequently, negligible normal operating leakage is expected from cracks within the tubesheet region. The consequences of an SGTR event are affected by the primary-to-secondary leakage flow during the event. Primary-to-secondary leakage flow through a postulated ruptured tube is not affected by the proposed change since the tubesheet enhances the tube integrity in the region of the hydraulic expansion by precluding tube deformation beyond its initial hydraulically expanded outside diameter.

The probability of an SLB is unaffected by the potential failure of a steam generator tube as this failure is not an initiator for an SLB.

The consequences of an SLB are also not significantly affected by the proposed change. During an SLB accident, the reduction in pressure above the tubesheet on the secondary side of the steam generator creates a uniformly distributed axial (out of plane) load on the tubesheet due to the reactor coolant system pressure on the primary of the tubesheet. The resulting bending action causes contraction of the tube holes below the tubesheet neutral axis, adding to the constraint of the tubes in the tubesheet, thereby further restricting primary-to-secondary leakage.

Primary-to-secondary leakage from tube degradation in the tubesheet area during the limiting accident (i.e., an SLB) is limited by flow restrictions resulting from the crack and tube-to-tubesheet contact pressures that provide a restricted leakage path above the indications and also limit the degree of potential crack face opening as compared to free span indications. The primary-to-secondary leak rate from tube degradation in the tubesheet region during postulated SLB accident conditions will be no more than twice that allowed during normal operating conditions when the pressure boundary is relocated to the lesser of the H* or B* depths. Since normal operating leakage would be limited to 300 gpd (0.2 gpm) through any one steam generator per TS 3.4.13, "RCS Operational LEAKAGE," the associated accident condition leak rate, assuming all leakage to be from lower tubesheet indications, would be limited to 150 gpd per steam generator. This value is well within the assumed accident leakage rate of 1.0 gpm discussed in WCGS Updated Safety Analysis Report, Table 15.1-3, "Parameters Used in Evaluating the Radiological Consequences of a Main Steam Line Break." Therefore, the consequences of an SLB accident remain unaffected.

Therefore, the proposed 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 accident from any accident previously evaluated?

Response: No

The proposed change does not introduce any new equipment, create new failure modes for existing equipment, or create any new limiting single failures. Plant operation will not be altered, and all safety functions will continue to perform as previously assumed in accident analyses. Therefore, the proposed changes do not create the possibility of a new or different kind of accident from any previously evaluated.

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

Response: No

The proposed changes maintain the required structural margins of the steam generator tubes for both normal and accident conditions. Nuclear Energy Institute (NEI) 97-06, "Steam Generator Program Guidelines," and RG 1.121, "Bases for Plugging Degraded PWR Steam Generator Tubes," are used as the bases in the development of the tubesheet inspection depth methodology for determining that steam generator tube integrity considerations are maintained within acceptable limits. RG 1.121 describes a method acceptable to the NRC for meeting General Design Criteria (GDC) 14, "Reactor coolant pressure boundary," GDC 15, "Reactor coolant system design," GDC 31, "Fracture prevention of reactor coolant pressure boundary," and GDC 32, "Inspection of reactor coolant pressure boundary," by reducing the probability and consequences of a SGTR. RG 1.121 concludes that by determining the limiting safe conditions for tube wall degradation the probability and consequences of a SGTR are reduced. This RG uses safety factors on loads for tube burst that are consistent with the requirements of Section III of the American Society of Mechanical Engineers (ASME) Code.

For axially oriented cracking located within the tubesheet, tube burst is precluded due to the presence of the tubesheet. For circumferentially oriented cracking, Westinghouse letter LTR-CDME-05-209-P, "Steam Generator Tube Alternate Repair Criteria for the Portion of the Tube Within the Tubesheet at the Wolf Creek Generating Station," defines a length of degradation-free expanded tubing that provides the necessary resistance to tube pullout due to the pressure induced forces, with applicable safety factors applied. Application of the limited tubesheet inspection depth criteria will preclude unacceptable primary-to-secondary leakage during all plant conditions. The methodology for determining leakage provides for large margins between calculated and actual leakage values in the proposed limited tubesheet inspection depth criteria.

Therefore, the proposed changes do no involve a significant reduction in any margin to safety.

Based on the above, WCNOC concludes that the proposed amendment 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.

5.2 Applicable Regulatory Requirements/Criteria

General design criteria (GDC) 1, 2, 4, 14, 30, 31, and 32 of 10 CFR 50, Appendix A, define requirements for the reactor coolant pressure boundary (RCPB) with respect to structural and leakage integrity.

General design criterion (GDC) 19 of 10 CFR 50, Appendix A, defines requirements for the control room and for the radiation protection of the operators working within it. Accidents involving the leakage or burst of steam generator tubing comprise a challenge to the habitability of the control room.

10 CFR 50, Appendix B, establishes quality assurance requirements for the design, construction and operation of safety related components. The pertinent requirements of this appendix apply to all activities affecting the safety related functions of these components. These requirements are described in Criteria IX, XI, and XVI of Appendix B and include control of special processes, inspection, testing, and corrective action.

10 CFR 100, Reactor Site Criteria, established reactor-siting criteria, with respect to the risk of public exposure to the release of radioactive fission products. Accidents involving leakage or tube burst of steam generator tubing may comprise a challenge to containment and therefore involve an increased risk of radioactive release.

Under 10 CFR 50.65, the Maintenance Rule, licensees classify steam generators as risk significant components because they are relied upon to remain functional during and after design basis events. Steam generators are to be monitored under 10 CFR 50.65(a)(2) against industry established performance criteria. Meeting the performance criteria of NEI 97-06, Revision 2, provides reasonable assurance that the steam generator tubing remains capable of fulfilling its specific safety function of maintaining the reactor coolant pressure boundary.

The NEI 97-06, Revision 2 steam generator performance criteria are:

1. All in-service steam generator tubes shall retain structural integrity over the full range of normal operating conditions (including startup, operation in the power range, hot standby, cool down and 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. The primary to secondary-accident induced leakage rate for any design basis accident, other than a steam generator tube rupture, shall not exceed the leakage rate assumed in the accident analysis in terms of total leakage rate for all steam generators and leakage rate for an individual steam generator. Leakage is not to exceed 1 gpm per steam generator, except for specific types of degradation at specific locations when implementing alternate repair criteria as documented in the Steam Generator Program technical specifications.

3. The RCS operational primary-to-secondary leakage through any one steam generator shall be limited to 150 gallons per day.

The safety significant portion of the tube is the length of tube that is engaged in the tubesheet from the secondary face that is required to maintain structural and leakage integrity over the full range of steam generator operating conditions, including the most limiting accident conditions. The evaluation in Enclosure I determined that degradation in tubing below the safety significant portion of the tube does not require plugging and serves as the bases for the tubesheet inspection program. As such, the inspection program at WCGS provides a high level of confidence that the structural and leakage criteria are maintained during normal operating and accident conditions.

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.

6.0 ENVIRONMENTAL CONSIDERATION

WCNOC has evaluated the proposed amendment for environmental considerations. The 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, and 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 significant increase in the amounts of any effluent that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed amendments meet the eligibility criterion for categorical exclusion set for 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.

7.0 REFERENCES

1. Letter ET 05-0021, "Application for Technical Specification Improvement Regarding Steam Generator Tube Integrity Using the Consolidated Line Item Improvement Process," from T. J. Garrett, WCNOC, to USNRC, November 3, 2005.

2. Westinghouse Electric Company LLC, LTR-CDME-05-209-P, "Steam Generator Tube Alternate Repair Criteria for the Portion of the Tube Within the Tubesheet at the Wolf Creek Generating Station," January 2006.

3. NRC Information Notice 2005-09, "Indications in Thermally Treated Alloy 600 Steam Generator Tubes and Tube-to-Tubesheet Welds," April 7, 2005.

4. NRC letter from J. N. Donohew, USNRC, to R. A. Muench, WCNOC, "Wolf Creek Generating Station – Issuance of Exigent Amendment RE: Steam Generator (SG) Tube Surveillance Program (TAC NO. MC6757)," April 28, 2005.

5. NEI 97-06, Revision 2, "Steam Generator Program Guidelines," May 2005.

6. EPRI TR-107569, "Steam Generator Examination Guidelines," Revision 6.

7. Federal Register Notice: Notice of Availability of Model Application Concerning Technical Specification; Improvement to Modify Requirements Regarding Steam Generator Tube Integrity; Using the Consolidate Line Item Improvement Process, published May 6, 2005 (70 FR 24126)

ATTACHMENT II

MARKUP OF TECHNICAL SPECIFICATION PAGES

5.5 Programs and Manuals

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

adjacent tube shall be selected and subjected to a tube inspection.

3. The tubes selected as the second and third samples (if required by Table 5.5.9-2 during each inservice inspection may be subjected to a partial tube inspection provided:

   a) The tubes selected for these samples include the tubes from those areas of the tube sheet array where tubes with imperfections were previously found, and

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

~~4. For Refueling Outage 14, a sample of the SG B and C inservice tubes from the top of the hot leg tubesheet to 10 inches below the top of the tubesheet shall be inspected by rotating probe. This sample shall include a 20% minimum sample of the total population of bulges and overexpansions within the SG from the top of the hot leg tubesheet to 17 inches below the top of the tubesheet.~~

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 not 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.
Note:	In all inspections, previously degraded tubes must exhibit significant (greater than 10%) further wall penetrations to be included in the above percentage calculations.

c. Inspection Frequencies - The above required inservice inspections of steam generator tubes shall be performed at the following frequencies:

(continued)

5.5 Programs and Manuals

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

a) 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 wall thickness, if detectable, may be considered as imperfections;

b) Degradation means a service-induced cracking, wastage, wear or general corrosion occurring on either inside or outside of a tube;

c) Degraded Tube means a tube containing imperfections greater than or equal to 20% of the nominal wall thickness caused by degradation;

d) % Degradation means the percentage of the tube wall thickness affected or removed by degradation;

e) Defect means an imperfection of such severity that it exceeds the plugging limit. A tube containing a defect is defective;

f) Plugging Limit means the imperfection depth at or beyond which the tube shall be removed from service and is equal to 40% of the nominal tube wall thickness. ~~During Refueling Outage 14 and the subsequent operating cycle, this criterion does not apply to degradation identified in the portion of the tube below 17 inches from the top of the hot leg tubesheet.~~ Degradation found in the portion of the tube below 17 inches from the top of the ~~hot leg~~ tubesheet does not require plugging. ~~During Refueling Outage 14 and the subsequent operating cycle, all~~ tubes with degradation identified in the portion of the tube within the region from the top of the ~~hot leg~~ tubesheet to ~~17 inches below the top of the tubesheet~~ shall be removed from service;

For tubes fully expanded into the tubesheet,

the depth identified in Table 5.5.9-3

g) 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 a Double Design Earthquake, a loss-of-coolant accident, or a steam line or feedwater line break as specified in 5.5.9.c.3.c, above;

(continued)

5.5 Programs and Manuals

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

For tubes fully expanded into the tubesheet,

the depth identified in Table 5.5.9-3

h) Tube Inspection means an inspection of the steam generator tube from the tube end (hot leg side) completely around the U-bend to the top support of the cold leg. ~~During Refueling Outage 14 and the subsequent operating cycle,~~ the portion of the tube below ~~17 inches~~ from the top of the ~~hot leg~~ tubesheet is excluded; and

i) Preservice Inspection means an inspection of the full length of each tube in each steam generator performed by eddy current techniques prior to service to establish a baseline condition of the tubing. This inspection shall be performed after the field hydrostatic test and prior to initial Power Operation using the equipment and techniques expected to be used during subsequent inservice inspections~~; and~~.

~~j) During Refueling Outage 14 and the subsequent operating cycle:~~

~~Bulge refers to a tube diameter deviation within the tubesheet of 18 volts or greater as measured by bobbin probe; and~~

~~Overexpansion refers to a tube diameter deviation within the tubesheet of 1.5 mils or greater as measured by bobbin probe.~~

2. Steam generator tube integrity shall be determined after completing the corresponding actions (plug all tubes exceeding the plugging limit and all tubes containing through-wall cracks) required by Table 5.5.9-2.

e. Reports

The contents and frequency of reports concerning the steam generator tube surveillance program shall be in accordance with Specification 5.6.10.

(continued)

5.5 Programs and Manuals

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

TABLE 5.5.9-2

STEAM GENERATOR TUBE INSPECTION

<table>
<tr><th colspan="3">1ST SAMPLE INSPECTION</th><th colspan="2">2ND SAMPLE INSPECTION</th><th colspan="2">3RD SAMPLE INSPECTION</th></tr>
<tr><th>Sample Size</th><th>Result</th><th>Action Required</th><th>Result</th><th>Action Required</th><th>Result</th><th>Action Required</th></tr>
<tr><td rowspan="9">A minimum of S Tubes per S.G.</td><td>C-1</td><td>None</td><td>N.A.</td><td>N.A.</td><td>N.A.</td><td>N.A.</td></tr>
<tr><td rowspan="5">C-2</td><td rowspan="5">Plug defective tubes and inspect additional 2S tubes in this S.G.</td><td>C-1</td><td>None</td><td>N.A.</td><td>N.A.</td></tr>
<tr><td rowspan="3">C-2</td><td rowspan="3">Plug defective tubes and inspect additional 4S tubes in this S.G.</td><td>C-1</td><td>None</td></tr>
<tr><td>C-2</td><td>Plug defective tubes</td></tr>
<tr><td>C-3</td><td>Perform action for C-3 result of first sample</td></tr>
<tr><td>C-3</td><td>Perform action for C-3 result of first sample</td><td>N.A</td><td>N.A.</td></tr>
<tr><td rowspan="3">C-3</td><td rowspan="3">Inspect all tubes in this S.G., plug defective tubes and inspect 2S tubes in each other S.G.</td><td>All other S.G.s are C-1</td><td>None</td><td>N.A.</td><td>N.A.</td></tr>
<tr><td>Some S.G.s C-2 but no additional S.G. are C-3</td><td>Perform action for C-2 result of second sample</td><td>N.A.</td><td>N.A.</td></tr>
<tr><td>Additional S.G. is C-3</td><td>Inspect all tubes in each S.G. and plug defective tubes.</td><td>N.A.</td><td>N.A.</td></tr>
</table>

$S = 3\frac{N}{n}\%$ Where N is the number of steam generators in the unit, and n is the number of steam generators inspected during an inspection.

INSERT A

(continued)

INSERT A

TABLE 5.5.9-3

STEAM GENERATOR TUBE INSPECTION DEPTHS

STEAM GENERATOR HOT LEG					
Inspection Depth Zones	H1	H2	H3	H4	H5
Radius of the Zone from the Vertical Centerline of the Tubesheet (inches)	2 - 14	>14 – 24	>24 – 34	>34 – 45	>45 - 59
Depth for the Zone (inches)	7.0	6.4	5.4	4.0	2.7

ATTACHMENT III

MARKUP OF TECHNICAL SPECIFICATION PAGES
(based on incorporation of changes associated with TSTF-449, Rev. 4)

5.5.9 Steam Generator (SG) Program (continued)

3. The operational LEAKAGE performance criterion is specified in LCO 3.4.13, "RCS Operational LEAKAGE."

c. Provisions for SG tube repair 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.

The following alternate tube repair criteria may be applied as an alternative to the 40% depth-based criteria:

1. For tubes fully expanded into the tubesheet, ~~For Refueling Outage 14 and the subsequent operating cycle,~~ degradation found in the portion of the tube below ~~17 inches~~ the depth identified in the below tables from the top of the ~~hot leg~~ tubesheet does not require plugging.

INSERT B

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 repair criteria. For tubes fully expanded into the tubesheet, ~~For Refueling Outage 14 and the subsequent operating cycle~~ the portion of the tube below ~~17 inches from~~ the top of the ~~hot leg~~ tubesheet is excluded. 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. An assessment of degradation 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 replacement.

2. Inspect 100% of the tubes at sequential periods of 120, 90, and, thereafter, 60 effective full power months. The first sequential period shall be considered to begin after the first inservice inspection of the SGs. In addition, inspect 50% of the tubes by the refueling outage nearest the midpoint of the period and the remaining 50% by the refueling outage nearest the end of the period. No SG shall operate for more than 48 effective full power months or two refueling outages (whichever is less) without being inspected.

(continued)

INSERT B

STEAM GENERATOR TUBE INSPECTION DEPTHS

STEAM GENERATOR HOT LEG					
Inspection Depth Zones	H1	H2	H3	H4	H5
Radius of the Zone from the Vertical Centerline of the Tubesheet (inches)	2 - 14	>14 – 24	>24 – 34	>34 – 45	>45 - 59
Depth for the Zone (inches)	7.0	6.4	5.4	4.0	2.7

STEAM GENERATOR COLD LEG				
Inspection Depth Zones	C1	C2	C3	C4
Radius of the Zone from the Vertical Centerline of the Tubesheet (inches)	2 - 20	>20 – 30	>30 – 45	>45 – 59
Depth for the Zone (inches)	7.0	6.1	4.8	2.7

ATTACHMENT IV

RETYPED TECHNICAL SPECIFICATION PAGES

(based on incorporation of changes associated with TSTF-449, Rev. 4)

5.5 Programs and Manuals

5.5.9 Steam Generator (SG) Program

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

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 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 and 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 per SG.

(continued)

ATTACHMENT IV

PROPOSED TECHNICAL SPECIFICATION BASES PAGES – INFORMATION ONLY

(based on incorporation of changes associated with TSTF-449, Rev. 4)

BASES

APPLICABLE SAFETY ANALYSES

The steam generator tube rupture (SGTR) accident is the limiting design basis event for SG tubes and avoiding an SGTR is the basis for this Specification. The analysis of an SGTR event assumes a bounding primary to secondary LEAKAGE rate equal to the operational LEAKAGE rate limits in LCO 3.4.13, "RCS Operational LEAKAGE," plus the leakage rate associated with a double-ended rupture of a single tube. The accident analysis for an SGTR assumes the contaminated secondary fluid is only briefly released to the atmosphere via atmospheric relief valves.

The analysis for design basis accidents and transients other than an SGTR assume the SG tubes retain their structural integrity (i.e., they are assumed not to rupture.) In these analyses, the steam discharge to the atmosphere is based on the total primary to secondary LEAKAGE from all SGs of 1 gallon per minute or is assumed to increase to 1 gallon per minute as a result of accident induced conditions. For accidents that do not involve fuel damage, the primary coolant activity level of DOSE EQUIVALENT I-131 is assumed to be equal to the LCO 3.4.16, "RCS Specific Activity," limits. For accidents that assume fuel damage, the primary coolant activity is a function of the amount of activity released from the damaged fuel. The dose consequences of these events are within the limits of GDC 19 (Ref. 2), 10 CFR 100 (Ref. 3) or the NRC approved licensing basis (e.g., a small fraction of these limits).

Steam generator tube integrity satisfies Criterion 2 of 10 CFR 50.36(c)(2)(ii).

LCO

The LCO requires that SG tube integrity be maintained. The LCO also requires that all SG tubes that satisfy the repair criteria be plugged in accordance with the Steam Generator Program.

During a SG inspection, any inspected tube that satisfies the Steam Generator Program repair criteria is removed from service by plugging. If a tube was determined to satisfy the repair criteria but was not plugged, the tube may still have tube integrity.

In the context of this Specification, a SG tube is defined as the entire length of the tube, including the tube wall, between the tube-to-tubesheet weld at the tube inlet and the tube-to-tubesheet weld at the tube outlet. ~~For Refueling Outage 14 and the subsequent operating cycle, degradation found in the portion of the tube below 17 inches from the top of the hot leg tube sheet does not require plugging. The portion of the tubes below 17 inches from the top of the hot leg tube sheet is excluded from tube inspections (Ref. 7) The tube-to-tubesheet weld is not considered part of the tube.~~

INSERT B 3.4.17-2

In order to preclude unnecessarily plugging tubes in the WCGS steam generators, an evaluation was performed to identify the safety significant portion of the tube within the tubesheet necessary to maintain structural and leakage integrity for both normal operating and accident conditions. For tubes fully expanded into the tubesheet, tube inspections will be limited to identifying and plugging degradation in the portion of the tubes as identified in Technical Specification 5.5.9, "Steam Generator (SG) Program," Section c.1. The tube inspection depth is based on an accident induced leak rate of 1 gpm total in the affected steam generator as specified in WCGS Updated Safety Analysis report, Table 15.1-3, "Parameters Used in Evaluating the Radiological Consequences of a Main Steam Line Break." The tube-to-tubesheet weld is not considered part of the tube (Reference 7).

BASES

REFERENCES

1. NEI 97-06, "Steam Generator Program Guidelines."
2. 10 CFR 50 Appendix A, GDC 19.
3. 10 CFR 100.
4. ASME Boiler and Pressure Vessel Code, Section III, Subsection NB.
5. Draft Regulatory Guide 1.121, "Basis for Plugging Degraded Steam Generator Tubes," August 1976.
6. EPRI, "Pressurized Water Reactor Steam Generator Examination Guidelines."
7. ~~License Amendment No. 162, "Wolf Creek Generating Station – Issuance of Exigent Amendment RE: Steam Generator (SG) Tube Surveillance Program (TAC NO. MC6757)," April 28, 2005.~~

Westinghouse letter LTR-CDME-05-209-P, "Steam Generator Tube Alternate Repair Criteria for the Portion of the Tube Within the Tubesheet at the Wolf Creek Generating Station," January 2006.

LIST OF COMMITMENTS

The following table identifies those actions committed to by WCNOC in this document. Any other statements in this submittal are provided for information purposes and are not considered to be commitments. Please direct questions regarding these commitments to Mr. Kevin Moles at (620) 364-4126.

COMMITMENT	Due Date/Event
WCNOC requests the proposed change be approved by September 15, 2006, to support the preparations for Refueling Outage 15, which is scheduled to start in October 2006. Once approved, the amendment will be implemented within 90 days and subsequent to the implementation of the amendment for Reference 2.	Within 90 days of issuance of amendment and subsequent to the implementation of the amendment for Reference 2