WOLF CREEK
NUCLEAR OPERATING CORPORATION

Terry J. Garrett
Vice President, Engineering

March 21, 2008

ET 08-0016

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

Reference: 1) Letter ET 08-0009, dated February 8, 2008, from T. J. Garrett, WCNOC, to USNRC

Subject: Docket No. 50-482: Response to Request for Additional Information Related to License Amendment Request for an Interim Alternate Repair Criterion to Technical Specification 5.5.9, "Steam Generator (SG) Program"

Gentlemen:

Reference 1 provided Wolf Creek Nuclear Operating Corporation's (WCNOC) application to revise Technical Specification (TS) 5.5.9, "Steam Generator (SG) Program," that proposed a one cycle revision to incorporate an interim alternate repair criterion (ARC) in the provisions for SG tube repair criteria during Refueling Outage 16 and the subsequent operating cycle. On February 20, 2008, the Nuclear Regulatory Commission (NRC) provided by electronic mail issues and comments related to the amendment application. A teleconference was held with representatives from WCNOC, Exelon Generation Company, Southern Nuclear Operating Company, NRC and other industry representatives on February 21, 2008, to discuss the issues and comments. Subsequent to this teleconference, the NRC provided a specific request for additional information (RAI) by electronic mail on February 28, 2008. On March 4, 2008, draft responses to the RAI were provided and a teleconference held on March 5, 2008. Four additional questions were provided to Southern Nuclear Operating Company by electronic mail on March 10, 2008. These additional questions are also applicable to the WCNOC application and responses are provided in Enclosure I. Subsequent teleconferences were held on March 12, and 14, 2008 to discuss several of the RAI questions.

Attachment I provides responses to questions 1 through 5. Attachment II provides revised markups of changes to the current TSs. Attachment III provides a List of Regulatory Commitments. Enclosure I contains LTR-CDME-08-43 P-Attachment that provides proprietary responses to questions 6 through 17. Enclosure II contains LTR-CDME-08-43 NP-Attachment that provides non-proprietary responses to questions 6 through 17. Enclosure III contains the affidavit for withholding proprietary information.

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Enclosure I provides the proprietary Westinghouse Electric Company LLC LTR-CDME-08-43 P-Attachment, "Response to NRC Request for Additional Information Relating to LTR-CDME-08-11 P-Attachment." Enclosure II provides the non-proprietary Westinghouse Electric Company LLC LTR-CDME-08-43 NP-Attachment, "Response to NRC Request for Additional Information Relating to LTR-CDME-08-11 P-Attachment." 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 2.390 of the Commission's regulations. This affidavit, along with Westinghouse authorization letter, CAW-08-2395, "Application for Withholding Proprietary Information from Public Disclosure," is contained in Enclosure III.

The additional information provided in the Attachments and Enclosures do not impact the conclusions of the No Significant Hazards Consideration provided in Reference 1. In accordance with 10 CFR 50.91, a copy of this submittal 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. Richard D. Flannigan at (620) 364-4117.

Sincerely,

Terry J. Garrett

TJG/rlt

Attachment I Response to Request for Additional Information
II Revised Technical Specification Markups
III List of Regulatory Commitments

Enclosure I Westinghouse Electric Company LLC LTR-CDME-08-43 P-Attachment, "Response to NRC Request for Additional Information Relating to LTR-CDME-08-11 P-Attachment"
II Westinghouse Electric Company LLC LTR-CDME-08-43 NP-Attachment, "Response to NRC Request for Additional Information Relating to LTR-CDME-08-11 P-Attachment"
III Westinghouse Electric Company LLC, LTR-CAW-08-2395, "Application for Withholding Proprietary Information from Public Disclosure"

cc: E. E. Collins (NRC), w/a, w/e
T. A. Conly (KDHE), w/a
J. N. Donohew (NRC), w/a, w/e
V. G. Gaddy (NRC), w/a, w/e
B. K. Singal (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 21st day of March, 2008.

Rhonda L. Tiemeyer
Notary Public

RHONDA L. TIEMEYER
MY COMMISSION EXPIRES
January 11, 2010

Expiration Date January 11, 2010

Response to Request for Additional Information

Reference 1 provided Wolf Creek Nuclear Operating Corporation's (WCNOC) application to revise Technical Specification (TS) 5.5.9, "Steam Generator (SG) Program," that proposed a one cycle revision to incorporate an interim alternate repair criterion (ARC) in the provisions for SG tube repair criteria during Refueling Outage 16 and the subsequent operating cycle. On February 20, 2008, the Nuclear Regulatory Commission (NRC) provided by electronic mail issues and comments related to the amendment application. A teleconference was held with representatives from WCNOC, Exelon Generation Company, Southern Nuclear Operating Company, NRC and other industry representatives on February 21, 2008, to discuss the issues and comments. Subsequent to this teleconference, the NRC provided a specific request for additional information (RAI) by electronic mail on February 28, 2008. This specific RAI included two additional questions that were not previously provided or discussed on February 21, 2008 and expanded the scope of Question 5. On March 4, 2008, draft responses to the RAI were provided and a teleconference held on March 5, 2008. Four additional questions were provided to Southern Nuclear Operating Company by electronic mail on March 10, 2008. These additional questions are also applicable to the WCNOC application and responses are provided in Enclosure I. Subsequent teleconferences was held on March 12, and 14, 2008 to discuss several of the RAI questions. Provided below are responses to RAI questions 1 through 5. Questions 6 through 17 are provided in Enclosure I.

1. *Technical specification (TS) 5.5.9.d.3 requires an inspection of each steam generator (SG) at the next refueling outage after a crack indication is found in any SG tube. The proposed amendment would change TS 5.5.9 d to exclude cracks in the lower 4 inches of the tubesheet from application of TS 5.5.9.d.3. The NRC staff notes that TS 5.5.9 d.3 reflects the uniquely high detection thresholds, high measurement uncertainties, and high growth rate uncertainties generally exhibited by cracks and, therefore, is intended to ensure timely detection of cracks before tube integrity is impaired. In addition, no significant crack growth rate data exists for circumferential cracking in the tubesheet expansion. As a result, discuss your plans to modify your amendment request to remove your proposal from TS 5.5.9.d.*

Response: In the February 21, 2008 teleconference, the NRC staff position is that the interim ARC should only be applicable for one operating cycle and should not exclude cracks in the lower 4 inches of the tubesheet from application of TS 5.5.9d.3. The issues provided in the February 20, 2008 electronic mail noted that the Staff position should have no consequence on planned inspections for Refueling Outage 17 if a permanent H*/B* amendment is approved by that time. Additionally, the position indicated that the permanent H*/B* amendment can include, if necessary, a clarification that cracks in the lower 4 inches of the tubesheet found during Refueling Outage 16 (or the subsequent operating cycle) are exempted from application of TS 5.5.9d.3.

The proposed change to TS 5.5.9d. is revised to not exclude crack indications in the lower 4 inches of the tubesheet from the application of TS 5.5.9d.3. However, TS 5.5.9 still requires changes to eliminate the previous wording that the portion of the tube below 17 inches from the top of the tubesheet is excluded from Refueling Outage 15 and the subsequent operating cycle. TS 5.5.9 is revised to eliminate this wording.

Proposed changes to TS 5.5.9d., as discussed in Reference 1, are noted in strikethrough text and italic type as follows:

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 repair criteria. ~~*For Refueling Outage 15 and the subsequent operating cycle, the portion of the tube below 17 inches from the top of the hot leg is excluded.*~~ *For Refueling Outage 16 and the 36-month eddy current inspection interval, SGs in which the portion of the tube below 17 inches from the top of the tubesheet has no greater than 183 degree circumferential service-induced crack-like flaws are excluded from the requirements of d.3 below.* 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.

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

This criterion would be revised as follows in response to the NRC question as noted in underlined strikethrough text and italic type:

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 repair criteria. ~~*For Refueling Outage 15 and the subsequent operating cycle, the portion of the tube below 17 inches from the top of the hot leg is excluded.*~~ ~~*For Refueling Outage 16 and the 36-month eddy current inspection interval, SGs in which the portion of the tube below 17 inches from the top of the tubesheet has no greater than 183 degree circumferential service-induced crack-like flaws are excluded from the requirements of d.3 below.*~~ 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.

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

Attachment II provides revised TS 5.5.9 pages and supersedes the proposed changes in Attachment II of Reference 1.

2. *For the same reasons as cited in the above request for additional information, discuss your plans to modify TS 5.5.9.c to eliminate the proposed alternate repair criteria (ARC) applicable to a 36 month inspection interval. In addition, discuss your plans to modify the following clauses: "and the subsequent 18 month inspection interval," and , "and the subsequent 18 month and 36 month eddy current inspection intervals," with the following, "and the subsequent operating interval." Similarly, discuss your plans for modifying the parenthetical expressions, "(and any inspections performed in the subsequent 18 month inspection interval or 36 month inspection interval)," in proposed new reporting requirements in TS 5.6.10.h, i, and j with the following: "and any inspections performed in the subsequent operating interval."*

Response: In the February 21, 2008 teleconference, the Staff position is that the interim ARC should only be applicable for one operating cycle. The proposed changes to TS 5.5.9c. and TS 5.6.10 are revised to specify "..Refueling Outage 16 and the subsequent operating cycle." Use of "operating cycle" is consistent with previously approved one-cycle amendments for WCNOC. Additionally, during the teleconference on February 21, 2008, the Staff specifically indicated that the Technical Specifications should be revised to address multiple circumferential flaws in the bottom 4 inches of the tube and the tube end weld. TS 5.5.9c.1. is revised to address multiple circumferential flaws. The response to Questions 10, 11, and 17 in Enclosure I provides additional information regarding the tube end inspection criteria.

Proposed changes to TS 5.5.9c., as discussed in Reference 1, are noted in italic type as follows:

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 *shall* be applied as an alternative to the 40% depth-based criteria:

1. For Refueling Outage *16 and subsequent 18-month eddy current inspection interval, tubes with less than or equal to a 214 degree circumferential service-induced crack-like flaw found in the portion of the tube below 17 inches from the top of the tubesheet do not require plugging. Tubes with greater than a 214 degree circumferential service-induced crack-like flaw found in the portion of the tube below 17 inches from the top of the tubesheet shall be removed from service.*

For Refueling Outage 16 and subsequent 36-month eddy current inspection interval, tubes with less than or equal to a 183 degree circumferential service-induced crack-like flaw found in the portion of the tube below 17 inches from the top of the tubesheet do not require plugging. Tubes with greater than a 183 degree circumferential service-induced crack-like flaw found in the portion of the tube below 17 inches from the top of the tubesheet shall be removed from service.

For Refueling Outage 16 and subsequent 18-month and 36-month eddy current inspection intervals, tubes with service-induced crack-like flaws located within the region from the top of the tubesheet to 17 inches below the top of the tubesheet shall be removed from service. Tubes with service-induced axial cracks found in the portion of the tube below 17 inches from the top of the tubesheet do not require plugging.

This criterion would be revised as follows in response to the NRC question and to add provisions with respect to multiple flaws in the bottom 4 inches of the tubesheet as noted in underlined strikethrough text and italic type:

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 *shall* be applied as an alternative to the 40% depth-based criteria:

1. For Refueling Outage *16 and the subsequent operating cycle ~~18-month eddy current inspection interval~~, tubes with flaws having a circumferential component less than or equal to a ~~214~~203 degrees ~~circumferential service-induced crack-like flaw~~ found in the portion of the tube below 17 inches from the top of the tubesheet and above 1 inch from the bottom of the tubesheet do not require plugging. Tubes with flaws having a circumferential component greater than a ~~214~~203 degrees ~~circumferential service-induced crack-like flaw~~ found in the portion of the tube below 17 inches from the top of the tubesheet and above 1 inch from the bottom of the tubesheet shall be removed from service.*

~~For Refueling Outage 16 and subsequent 36-month eddy current inspection interval, tubes with less than or equal to a 183 degree circumferential service-induced crack-like flaw found in the portion of the tube below 17 inches from the top of the tubesheet do not require plugging. Tubes with greater than a 183 degree circumferential service-induced crack-like flaw found in the portion of the tube below 17 inches from the top of the tubesheet shall be removed from service.~~

~~For Refueling Outage 16 and subsequent 18-month and 36-month eddy current inspection intervals, t~~Tubes with service-induced ~~crack-like~~ flaws located within the region from the top of the tubesheet to 17 inches below the top of the tubesheet shall be removed from service. Tubes with service-induced axial cracks found in the portion of the tube below 17 inches from the top of the tubesheet do not require plugging.

When more than one flaw with circumferential components is found in the portion of the tube below 17 inches from the top of the tubesheet and above 1 inch from the bottom of the tubesheet with the total of the circumferential components greater than 203 degrees and an axial separation distance of less than 1 inch, then the tube shall be removed from service. When the circumferential components of each of the flaws are added, it is acceptable to count the overlapped portions only once in the total of circumferential components.

When one or more flaws with circumferential components are found in the portion of the tube within 1 inch from the bottom of the tubesheet, and the total of the circumferential components found in the tube exceeds 94 degrees, then the tube shall be removed from service. When one or more flaws with circumferential components are found in the portion of the tube within 1 inch from the bottom of the tubesheet and within 1 inch axial separation distance of a flaw above 1 inch from the bottom of the tubesheet, and the total of the circumferential components found in the tube exceeds 94 degrees, then the tube shall be removed from service. When the circumferential components of each of

the flaws are added, it is acceptable to count the overlapped portions only once in the total of circumferential components.

Proposed changes to TS 5.6.10, as discussed in Reference 1, are noted in strikethrough text and italic type as follows:

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

a. The scope of inspections performed on each SG;

b. Active degradation mechanisms found;

c. Nondestructive examination techniques utilized for each degradation mechanism;

d. Location, orientation (if linear), and measured sizes (if available) of service induced indications;

e. Number of tubes plugged during the inspection outage for each active degradation mechanism;

f. Total number and percentage of tubes plugged to date; and

g. The results of condition monitoring, including results of tube pulls and in-situ testing."

h. Following completion of an inspection performed in Refueling Outage 16 (and any inspections performed in the subsequent 18-month inspection interval or 36-month inspection interval), the number of indications and location, size, orientation, and whether initiated on primary or secondary side for each service-induced crack-like flaw within the thickness of the tubesheet;

i. Following completion of an inspection performed in Refueling Outage 16 (and any inspections performed in the subsequent 18-month inspection interval or 36-month inspection interval), the primary to secondary LEAKAGE rate observed in each SG (if it is not practical to assign leakage to an individual SG, the entire primary to secondary LEAKAGE should be conservatively assumed to be from one SG) during the cycle preceding the inspection which is the subject of the report; and

j. Following completion of an inspection performed in Refueling Outage 16 (and any inspections performed in the subsequent 18-month inspection interval or 36-month inspection interval), the calculated accident leakage rate from the portion of the tube 17 inches below the top of the tubesheet for the most limiting accident in the most limiting SG.

The reporting criteria would be revised as follows in response to the NRC question and to add provisions with respect to multiple flaws in the bottom 4 inches of the tubesheet as noted in underlined strikethrough text and italic type:

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

a. The scope of inspections performed on each SG;

b. Active degradation mechanisms found;

c. Nondestructive examination techniques utilized for each degradation mechanism;

d. Location, orientation (if linear), and measured sizes (if available) of service induced indications;

e. Number of tubes plugged during the inspection outage for each active degradation mechanism;

f. Total number and percentage of tubes plugged to date; and

g. The results of condition monitoring, including results of tube pulls and in-situ testing.

h. Following completion of an inspection performed in Refueling Outage 16 (and any inspections performed in the subsequent ~~18-month inspection interval or 36-month inspection interval~~ operating cycle), the number of indications and location, size, orientation, ~~and~~ whether initiated on primary or secondary side for each service-induced ~~crack-like~~ flaw within the thickness of the tubesheet, and the total of the circumferential components and any circumferential overlap below 17 inches from the top of the tubesheet as determined in accordance with TS 5.5.9c.1;

i. Following completion of an inspection performed in Refueling Outage 16 (and any inspections performed in the subsequent ~~18-month inspection interval or 36-month inspection interval~~ operating cycle), the primary to secondary LEAKAGE rate observed in each SG (if it is not practical to assign leakage to an individual SG, the entire primary to secondary LEAKAGE should be conservatively assumed to be from one SG) during the cycle preceding the inspection which is the subject of the report; and

j. Following completion of an inspection performed in Refueling Outage 16 (and any inspections performed in the subsequent ~~18-month inspection interval or 36-month inspection interval~~ operating cycle), the calculated accident leakage rate from the portion of the tube below 17 inches from the top of the tubesheet for the most limiting accident in the most limiting SG.

Attachment II provides revised TS 5.5.9 pages and supersedes the proposed changes in Attachment II of Reference 1.

3. *Given that the ability of eddy current to size cracks in the weld has not been demonstrated, justify the position in the amendment request that visual inspection of the weld will not be performed unless the eddy current results indicate that a weld flaw is greater than the weld crack acceptance criteria.*

Response: A teleconference was held with representatives from WCNOC, Exelon Generation Company, Southern Nuclear Operating Company, NRC Staff and other industry representatives on March 14, 2008, which included discussing the recent results of the peer review of the Catawba Unit 2, 2007 cold leg tube indications. The results of the peer review were presented to other members of the Staff on March 13, 2008.

There were ten tubes included in the evaluation. A tubesheet mockup was used to evaluate the capability of eddy current testing (ECT) to discriminate the tube end from the weld. The mockup contained eight tubes that were fully expanded into a full depth tubesheet with cladding and autogenous welds. EDM notches were put into two of the mockup tubes, R11C16 and R12C15. The notches were both axial and circumferential. Rotating coil and X-Probe data were collected. The ECT coil sensing field integrates the approaching tube end exit signal and weld area simultaneously. Based upon physical geometry, there is a limited axial component of the weld (-0.020") offering limited opportunity for detection. The Catawba signals were large in terms of amplitude compared to the mockup flaws. Since ECT does not discern the weld material from the tube material, identification of the tube end is approximate. All Catawba indications are far enough from the tube end to conclude that they are above the probable location of the weld. ECT detection is not optimum within the weld, based on the 40% circ EDM notch reviewed in the mockup (reference mockup tube R11C16).

Utilizing the above information, cracking exclusively in the tube end weld is not considered a potential damage mechanism for the purposes of the Degradation Assessment. This is appropriate since there were no reported instances of cracks only in the weld. PWSCC will continue to be considered a potential damage mechanism for the portion of the tube within the tubesheet.

In discussion with the Staff, it was determined for the portion of the tube 1" from the bottom of the tubesheet, flaws having a circumferential component of greater than the calculated value (subsequently determined to be 94 degrees) should be removed from service and that a visual inspection of the tube end weld would not be required. As such, TS 5.5.9c.1 is revised to reflect this position and the commitment in Reference 1 concerning the performance of visual inspections is withdrawn.

4. *Clarify the amendment request that the proposed ARC applies to the circumferential component of flaws in general rather than simply circumferential, service induced, crack-like flaws. (The NRC staff notes that no basis has been provided for limiting the ARC to service-induced flaws.) An example of an acceptable approach is to replace the proposed words, "tubes with less than or equal to a 214 degree circumferential service-induced crack-like flaw ...," with the words, "tubes with flaws having a circumferential component less than or equal to 214 degrees ...."*

Response: The proposed wording for the portion of the tube below 17 inches from the top of the tubesheet has been revised to reflect the wording "flaws having a circumferential

component." See the revised TS wording in the response to Question 2 above. In a teleconference with the Staff on March 5, 2008, the Staff questioned the use of "service-induced crack-like flaws" for the portion of the tube from the top of the tubesheet to 17 inches below the top of the tubesheet. This wording was being maintained based on the discussion at the July 11, 2007 meeting and the response to RAI question 34 in Reference 2. From the March 5, 2008 teleconference, it was agreed to remove "crack-like" from the proposed wording in TS 5.5.9c.1 and TS 5.6.10h.

5. *Visual examinations of the weld will be performed on a best effort basis with inspection systems capable of achieving a resolution similar to the Maximum Procedure Demonstration Lower Case Character Height as discussed in ASME Section XI. Provide the code edition and addenda that describe this proposed inspection resolution. For visual detection of stress corrosion cracks in other components, a resolution sensitivity sufficient to detect a 1 mil wide wire or crack (as a substitute for a visual examination) has been accepted by the NRC, as described in Title 10 of the Code of Federal Regulations, Part 50.55a(b)(2)(xxi). For the inspection approach to be implemented under this license amendment, provide a description of the performance demonstration process and results that demonstrate the ability to reliably detect flaws with characteristics similar to those that might be expected to be found in these welds.*

Response: See the response to Question 3.

References:

1. WCNOC letter ET 08-0009, "Revision to Technical Specification (TS) 5.5.9, "Steam Generator (SG) Program" for Interim Alternate Repair Criteria," February 8, 2008.

2. WCNOC letter ET 07-0043, "Response to Request for Additional Information Related to License Amendment Request to Revise the Steam Generator Program," September 27, 2007.

Revised Technical Specification Markups

5.5 Programs and Manuals

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~~ ***shall*** be applied as an alternative to the 40% depth-based criteria:

1. For Refueling Outage ~~15 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. All tubes with degradation identified in the portion of 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.~~

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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 Refueling Outage 15 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.

(continued)

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16 and the subsequent operating cycle, tubes with flaws having a circumferential component less than or equal to 203 degrees found in the portion of the tube below 17 inches from the top of the tubesheet and above 1 inch from the bottom of the tubesheet do not require plugging. Tubes with flaws having a circumferential component greater than 203 degrees found in the portion of the tube below 17 inches from the top of the tubesheet and above 1 inch from the bottom of the tubesheet shall be removed from service.

Tubes with service-induced flaws located within the region from the top of the tubesheet to 17 inches below the top of the tubesheet shall be removed from service. Tubes with service-induced axial cracks found in the portion of the tube below 17 inches from the top of the tubesheet do not require plugging.

When more than one flaw with circumferential components is found in the portion of the tube below 17 inches from the top of the tubesheet and above 1 inch from the bottom of the tubesheet with the total of the circumferential components greater than 203 degrees and an axial separation distance of less than 1 inch, then the tube shall be removed from service. When the circumferential components of each of the flaws are added, it is acceptable to count the overlapped portions only once in the total of circumferential components.

When one or more flaws with circumferential components are found in the portion of the tube within 1 inch from the bottom of the tubesheet, and the total of the circumferential components found in the tube exceeds 94 degrees, then the tube shall be removed from service. When one or more flaws with circumferential components are found in the portion of the tube within 1 inch from the bottom of the tubesheet and within 1 inch axial separation distance of a flaw above 1 inch from the bottom of the tubesheet, and the total of the circumferential components found in the tube exceeds 94 degrees, then the tube shall be removed from service. When the circumferential components of each of the flaws are added, it is acceptable to count the overlapped portions only once in the total of circumferential components.

5.6 Reporting Requirements

5.6.10 Steam Generator Tube Inspection Report

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

a. The scope of inspections performed on each SG;

b. Active degradation mechanisms found;

c. Nondestructive examination techniques utilized for each degradation mechanism;

d. Location, orientation (if linear), and measured sizes (if available) of service induced indications;

e. Number of tubes plugged during the inspection outage for each active degradation mechanism;

f. Total number and percentage of tubes plugged to date; and

g. The results of condition monitoring, including the results of tube pulls and in-situ testing.

INSERT 5.0-26

INSERT 5.0-26

h. Following completion of an inspection performed in Refueling Outage 16 (and any inspections performed in the subsequent operating cycle), the number of indications and location, size, orientation, whether initiated on primary or secondary side for each service-induced flaw within the thickness of the tubesheet, and the total of the circumferential components and any circumferential overlap below 17 inches from the top of the tubesheet as determined in accordance with TS 5.5.9c.1;

i. Following completion of an inspection performed in Refueling Outage 16 (and any inspections performed in the subsequent operating cycle), the primary to secondary LEAKAGE rate observed in each SG (if it is not practical to assign leakage to an individual SG, the entire primary to secondary LEAKAGE should be conservatively assumed to be from one SG) during the cycle preceding the inspection which is the subject of the report; and

j. Following completion of an inspection performed in Refueling Outage 16 (and any inspections performed in the subsequent operating cycle), the calculated accident leakage rate from the portion of the tube below 17 inches from the top of the tubesheet for the most limiting accident in the most limiting SG.

LIST OF REGULATORY 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. Richard Flannigan at (620) 364-4117.

COMMITMENT	Due Date/Event
None	

Westinghouse Electric Company LLC LTR-CDME-08-43 NP-Attachment, "Response to NRC Request for Additional Information Relating to LTR-CDME-08-11 P-Attachment"