

WOLF CREEK

NUCLEAR OPERATING CORPORATION

September 27, 2007

Terry J. Garrett
Vice President, Engineering

ET 07-0043

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

- Reference:
- 1) Letter ET 06-0004, dated February 21, 2006, from T. J. Garrett, WCNOG, to USNRC
 - 2) Letter dated June 27, 2006, from J. N. Donohew, USNRC, to R. A. Muench, WCNOG
 - 3) Letter WO 07-0012, dated May 3, 2007, from S. E. Hedges, WCNOG, to USNRC

Subject: Docket No. 50-482: Response to Request for Additional Information Related to License Amendment Request to Revise the Steam Generator Program

Gentlemen:

Reference 1 provided Wolf Creek Nuclear Operating Corporation's (WCNOG) application 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 Wolf Creek Generating Station (WCGS) steam generators from periodic steam generator tube inspections. Amendment No. 164 dated May 8, 2006, revised the title of TS 5.5.9 to "Steam Generator (SG) Program." Reference 2 provided a request for additional information (RAI) based on the NRC staff review of Reference 1. Reference 3 provided WCNOG's response to the RAI.

The NRC provided by electronic mail on June 22, 2007 a second request for additional information. A meeting was held on July 11, 2007 between the NRC staff and WCNOG staff to provide a dialogue on the questions and an understanding of what information the NRC staff needed to complete its review of the license amendment request. The meeting resulted in some changes to the questions that are reflected in the Attachment and Enclosure I.

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Enclosure I provides the proprietary Westinghouse Electric Company LLC LTR-CDME-07-198 P-Attachment, "Response to NRC Request for Additional Information Relating to LTR-CDME-07-72 P-Attachment and LTR-CDME-05-209-P of the Wolf Creek Generating Station (WCGS) Permanent B* License Amendment Request." Enclosure II provides the non-proprietary Westinghouse Electric Company LLC LTR-CDME-07-198 NP-Attachment, "Response to NRC Request for Additional Information Relating to LTR-CDME-07-72 P-Attachment and LTR-CDME-05-209-P of the Wolf Creek Generating Station (WCGS) Permanent B* License Amendment Request." 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-07-2335, "Application for Withholding Proprietary Information from Public Disclosure," is contained in Enclosure III.

Attachment I provides responses to questions 30 through 36. Attachment II provides revised markups of changes to the current TSs. Enclosure I contains LTR-CDME-07-198 P-Attachment that provides proprietary responses to questions 1-29. Enclosure II contains LTR-CDM-07-198 NP-Attachment that provides non-proprietary responses to questions 1-29. Enclosure III contains the affidavit for withholding proprietary information. Enclosure IV and Enclosure V provide specific referenced documents requested by the NRC in response to question 25.

Some of the documents requested are information prepared by organizations other than WCNO. These documents are beyond the control of WCNO and cannot be verified and validated by WCNO. In providing information responsive to the request, WCNO makes no representation as to its accuracy or completeness.

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.

This letter contains no commitments. If you have any questions concerning this matter, please contact me at (620) 364-4084, or Mr. Kevin Moles at (620) 364-4126.

Sincerely,



Terry J. Garrett

TJG/rit

Attachment

- Enclosures
- I - Westinghouse Electric Company LLC LTR-CDME-07-198 P-Attachment, "Response to NRC Request for Additional Information Relating to LTR-CDME-07-72 P-Attachment and LTR-CDME-05-209-P of the Wolf Creek Generating Station (WCGS) Permanent B* License Amendment Request"
 - II - Westinghouse Electric Company LLC LTR-CDME-07-198 NP-Attachment, "Response to NRC Request for Additional Information Relating to LTR-CDME-07-72 P-Attachment and LTR-CDME-05-209-P of the Wolf Creek Generating Station (WCGS) Permanent B* License Amendment Request."
 - III - Westinghouse Electric Company LLC LTR CAW-07-2335, "Application for Withholding Proprietary Information from Public Disclosure"
 - IV - Detection and Accommodation of Outliers in Normally Distributed Data Sets
 - V - A Note on the Robustness of Dixon's Ratio Test in Small Samples

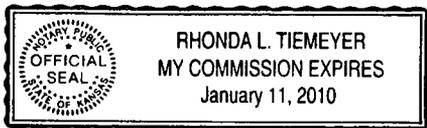
cc: E. E. Collins (NRC), w/a, w/e
T. A. Conley (KDHE), w/a, w/e (Enclosure II only)
J. N. Donohew (NRC), w/a, w/e
V. G. Gaddy (NRC), w/a, w/e
Senior Resident Inspector (NRC), w/a, w/e

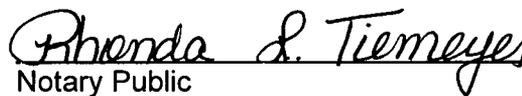
STATE OF KANSAS)
) SS
COUNTY OF COFFEY)

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 27th day of September, 2007.




Notary Public

Expiration Date January 11, 2010

RESPONSE TO SECOND REQUEST FOR ADDITIONAL INFORMATION

The Nuclear Regulatory Commission (NRC) provided by electronic mail on June 22, 2007 a second request for additional information. A meeting was held on July 11, 2007 between the NRC staff and Wolf Creek Nuclear Operating Corporation (WCNOC) staff to provide a dialogue on the questions and an understanding of what information the NRC staff needed to complete its review of the license amendment request. The meeting resulted in some changes to the questions that are reflected in this Attachment and Enclosure I. This Attachment provides WCNOC specific responses to questions 30 through 36. Enclosure I provides responses to questions 1 through 29. The NRC questions are italicized.

30. Reference 2, Attachment II - Proposed TS 5.5.9.c states that, "The following alternate tube repair criteria may be applied as an alternative to the 40% depth-based criteria." This appears to mean that you are proposing that the implementation of the alternate tube repair criterion is optional. It is the NRC staff's position that the word "may" should be "shall." Discuss and explain your proposed use of the word "may." Alternatively, the proposed inspection exclusion zone in TS 5.5.9.d could be revised to make the exclusion conditional on implementation of the alternate repair criterion in TS 5.5.9.c.1.

Response: The license amendment request did not propose any changes to the stated sentence in the above question. The wording currently in the technical specifications was based on NRC approved Revision 4 of Technical Specification Task Force (TSTF) 449, "Steam Generator Tube Integrity," which has been incorporated into NUREG-1431, "Standard Technical Specifications Westinghouse Plants," Rev. 3.1. This wording was approved by the NRC for WCGS in Amendment No. 164 on May 8, 2006. In the meeting on July 11, 2007, the NRC indicated the wording should be changed to "shall" to ensure that the steam generator tube inspection provisions require the use of the alternate tube repair criteria when tube inspection depths are not the entire length of the tubesheet. Based on this interpretation by the NRC staff, WCNOC is revising the sentence in TS 5.5.9c. as follows: "The following alternate tube repair criteria shall be applied as an alternative to the 40% depth-based criteria:"

31. Reference 2, Attachment II - The first sentence of proposed TS 5.5.9.c.1 states, "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." Discuss your plans for revising this sentence to clarify what constitutes a fully expanded tube (e.g., through the use of a footnote) and for clarifying the rest of the sentence. For example, the word "degradation" should be replaced with "tubes with flaws." This is consistent with the rest of TS 5.5.9 which uses the word "flaws" rather than the word "degradation." In addition, it is tubes which are plugged, not flaws. As another example, it is believed that clarity can be gained by revising the sentence to state, "..., tubes with flaws located below the depths identified in the following tables ..."

Response: WCNOC letter ET 06-0004 identified that one tube in Steam Generator B (R11, C121) was determined to not be fully expanded in the hot leg during the manufacturing process. In Refueling Outage 16 (Spring 2008), WCNOC plans to plug this tube which will eliminate the need for the wording "For tubes fully expanded into the tubesheet."

This question also recommends replacing the word "degradation" with "tubes with flaws." The word "degradation" was utilized in the proposed changes as this wording had been previously approved in two one-cycle license amendments (Amendment No. 162 and No. 169). As discussed at the July 11, 2007 meeting, WCNOG had concerns with the use of "flaw" in lieu of "degradation, and during the meeting, it was agreed to use "service-induced volumetric or crack-like flaws." Based on the agreement at the July 11, 2007, meeting, WCNOG is revising the proposed technical specifications.

32. Reference 2, Attachment II - The second sentence of proposed TS 5.5.9.c.1 states, "All tubes with degradation identified in the portion of tube within the region from the top of the tubesheet to the depth identified in the below tables shall be removed from service. Discuss and explain the proposed use of the word "degradation" instead of the word "flaws." The use of the word "flaws" is consistent with the rest of TS 5.5.9 which uses the word "flaws" rather than the word "degradation." In addition, the NRC staff suggests the licensee may wish to consider replacing the words "below tables" with "following tables."

Response: This question is in part a duplicate of portions of Question 31. See the response to Question 31. Additionally, WCNOG is revising the proposed technical specifications from "below tables" to "following tables" as suggested by the NRC staff.

33. Reference 2, Attachment II - The proposed revision to TS 5.5.9.d includes the following sentence, "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." This sentence is confusing as to what is intended by the sentence. Discuss and clarify [what] this sentence is intended to mean. For example, the sentence could be clarified by stating, "...the portion of the tube below the inspection depths from the top of the tubesheet identified in C.1 above is excluded."

Response: See the response to Question 31 for the portion of the sentence referring to tubes fully expanded into the tubesheet.

TS 5.5.9d. provides the requirements for steam generator tube inspections. The specification requires the entire length of the tube in the tube sheet be inspected with a qualified probe. The intent of the subject sentence is to specify that portion of the tube below the top of the tubesheet that is not required to meet the tube inspection requirements. The proposed technical specifications will be clarified by revising the wording to state: "The portion of the tube below the inspection depths from the top of the tubesheet identified in c.1 above is excluded."

34. Reference 2, Attachment II - Proposed specification TS 5.6.10.h - Discuss and clarify the words "for each indication" in the phrase "for each service-induced indication within the thickness of the tubesheet."

Response: Based on the July 11, 2007 meeting and the meeting minutes issued on August 7, 2007, the question was restated as follows: "Reference 2, Attachment II – Proposed specification TS 5.6.10.h – In listing what should be included in the SG tube inspection report, you have used the phrase "for each indication" in proposed item h. Discuss and clarify what is meant by this phrase and consider using what is more clear phrase "for each service-induced

indication within the thickness of the tubesheet.” As discussed in the response to Question 31, the wording “service-induced volumetric or crack-like flaws” will be used in lieu of “for each indication.” Additionally, the wording is revised to indicate that this reporting criterion applies to area within the thickness of the tubesheet.

35. Reference 2, Attachment II - Proposed specification TS 5.6.10.j - Discuss and clarify the used [use] of the words “is determined” in the second sentence. The NRC staff suggests that the words “is determined” in the second sentence should be replaced to read “was determined.”

Response: The proposed technical specifications are revised from “is determined” to “was determined.”

36. The proposed technical specification amendment would apply to both the hot and cold leg side; however, the NRC staff notes there have been no reported instances of cracks in the tubesheet region for plants with Alloy 600 thermally treated tubing and, thus, there seems to be little compelling reason to extend the applicability of the requested amendment to the cold leg side. Discuss and explain why the amendment request should apply to both the hot leg side and the cold leg side. It is the NRC staff's position that the amendment request should not apply to cold leg side.

Response: The H* and B* analysis was performed for both the hot leg and cold leg portion of the tubesheet. With the technical basis available for both the hot leg and cold leg, inclusion of the inspection in the technical specifications would encompass any unforeseen future degradation in the cold leg. Including the cold leg portion of the tubesheet in the technical specifications would limit the inspection depths that may be needed in the future.

Revised Markups of Current Technical Specification Pages

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 ^{shall} may 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.~~

INSERT 5.0-12

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.

The portion of the tube below the inspection depths from the top of the tubesheet identified in c.1 above is excluded.

(continued)

INSERT 5.0-12

Tubes with service-induced volumetric or crack-like flaws located below the depths identified in the following tables do not require plugging. All tubes with service-induced volumetric or crack-like flaws located within the region from the top of the tubesheet to the depth identified in the following tables shall be removed from service.

STEAM GENERATOR TUBE INSPECTION DEPTHS

STEAM GENERATOR HOT LEG			
Inspection Depth Zones	H1	H2	H3
Radius of the Zone from the Vertical Centerline of the Tubesheet (inches)	2 - 37	>37 – 50	>50 – 59
Depth for the Zone (inches)	13.5	11.0	7.0

STEAM GENERATOR COLD LEG		
Inspection Depth Zones	C1	C2
Radius of the Zone from the Vertical Centerline of the Tubesheet (inches)	2 - 37	>37 – 59
Depth for the Zone (inches)	15.0	11.0

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. The number of indications and location, size, orientation, and whether initiated on primary or secondary side for each service-induced volumetric or crack-like flaw within the thickness of the tubesheet;
- i. The primary to secondary LEAKAGE rate observed in each SG (if it is not practical to assign the LEAKAGE to an individual SG, the entire primary to secondary LEAKAGE should be conservatively assumed to be from one SG) during the cycle proceeding the inspection which is the subject of the report; and
- j. The calculated accident leakage rate from the portion of the tubes below the depths identified in the Tables in TS 5.5.9 c.1. for the most limiting accident in the most limiting SG. In addition, if the calculated accident leakage rate from the most limiting accident is less than 2 times the maximum primary to secondary LEAKAGE rate, the report should describe how it was determined.