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Docket Number 50-346

License Number NPF-3

Serial Number 3338

April 24, 2007

United States Nuclear Regulatory Commission
Document Control Desk
Washington, D. C. 20555-0001Subject: Response to Request for Additional Information Regarding License
Amendment Request 05-0009 – Steam Generator Tube Integrity (TAC No.
MD2145)

Ladies and Gentlemen:

By letter dated May 30, 2006 (Serial No. 3231), the FirstEnergy Nuclear Operating Company (FENOC) submitted License Amendment Request (LAR) No. 05-0009 that would revise steam generator tube integrity Technical Specifications for Davis-Besse Nuclear Power Station (DBNPS), Unit No. 1. Subsequently, by letter dated March 30, 2007, the NRC provided a request for additional information containing questions involving clarity and precision of proposed Technical Specification wording in the May 30, 2006 FENOC submittal.

Attachment 1 provides responses to the NRC staff's questions. Enclosure 1 provides updated portions of the proposed Technical Specification markups originally described in LAR 05-0009. Changes made in the updated markups reflect the responses provided in Attachment 1. FENOC has determined that the revisions proposed by this supplement do not affect the original evaluation of proposed changes or the No Significant Hazards Consideration Determination provided in the May 30, 2006 submittal.

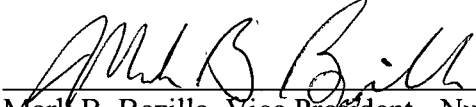
Attachment 2 identifies that there are no commitments contained in this submittal. If there are any questions or if additional information is required, please contact Mr. Henry L. Hegrat, Supervisor – FENOC Fleet Licensing, at (330) 374-3114.

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I declare under penalty of perjury that the foregoing is true and correct. Executed on April 24, 2007.

Very truly yours,



Mark B. Bezilla, Vice President - Nuclear

Enclosures

1. Revisions to Proposed DBNPS Technical Specifications

Attachments

1. Response to Request for Additional Information
2. Commitment List

cc: Regional Administrator, NRC Region III
NRC/NRR Project Manager
Executive Director, Ohio Emergency Management Agency,
State of Ohio (NRC Liaison)
NRC Senior Resident Inspector
Utility Radiological Safety Board

**RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION
DAVIS-BESSE NUCLEAR POWER STATION (DBNPS)
LICENSE AMENDMENT REQUEST NO. 05-0009 - STEAM GENERATOR
TUBE INTEGRITY (TAC NO. MD2145)**

To complete their review, the NRC staff has requested additional information regarding requested revisions to DBNPS technical specification requirements related to steam generator tube integrity. FENOC's response to this request is provided below.

Question 1:

Regarding proposed TS 3.4.6.2, is the acronym "GPD" defined elsewhere in the TS? The proposed revisions to surveillance requirement 4.4.6.2.1, paragraph 'e' does not make a formal connection between "GPD" and "gallons per day." Is there a concern "GPD" could be misconstrued as a misprint of "GPM?" Discuss whether there is a need to clarify what "GPD" means in TS 3.4.6.2.

DBNPS Response:

The abbreviation is not defined in the TS; however, there is no concern that "GPD" could be misconstrued as a misprint of "GPM." The corresponding proposed Surveillance Requirement 4.4.6.2.1.e uses the phrase "gallons per day." Industry guidance provided by NEI 97-06, Revision 2 establishes the 150 gallons per day value and DBNPS procedure NG-DB-00120, "Primary-to-Secondary Leak Monitoring Program" defines the abbreviation as meaning, "gallons per day." The Improved Technical Specifications (ITS) license amendment request that is being prepared for submittal for DBNPS spells out the phrase "gallons per day." However, since the proposed TS are being revised to address other concerns, they have also been revised to replace the abbreviation "GPD" with the phrase "gallons per day."

Question 2:

Proposed TS 6.8.4 g.3 can be interpreted to mean that for sleeved tubes, less than 40 percent deep flaws in either the parent tube or the sleeve at the sleeve tubesheet expansion joint or at either of the two free span expansion joints are acceptable. Provide the technical basis as to why up to 40 percent deep flaws in either the parent tube or sleeve are acceptable at these locations, both in terms of adequate leak tightness of these joints and in terms of the ability of these joints to transmit the necessary axial loads for normal operating and accident conditions. Alternatively, describe your plans to revise proposed TS 6.8.4 g.3 such that flaws in the parent tube or sleeve at these locations will be plugged on detection.

DBNPS Response:

Since the originally proposed TS 6.8.4 g.3 could have been interpreted as stated, revised wording is proposed. The scope of the revised requirement in TS 6.8.4 g.3.a has been reduced to regions of the tube that do not contain a repair, thus excluding application of the 40 percent criterion from sleeve joints (i.e. roll expansions). TS 6.8.4 g.3.c was added to require that tubes with a flaw in either the parent tube or the sleeve, within a sleeve-to-tube joint, shall be plugged.

Question 3:

Proposed TS 6.8.4 g.3 can be interpreted to mean that sleeved tubes containing flaws in the sleeve with depths equal to or exceeding 40 percent of the nominal sleeve wall thickness may be repaired rather than plugged. Discuss your plans for clarifying TS 6.8.4 g.3 that such tubes are to be plugged, not repaired.

DBNPS Response:

The proposed TS have been revised to include TS 6.8.4 g.3.b, requiring that sleeves found by inservice inspection to contain flaws, in a region of the sleeve that contains no sleeve joint, with a depth equal to or exceeding 40 percent of the nominal sleeve wall thickness shall be plugged. Flaws in a sleeve at a sleeve-to-tube joint have been addressed as described in response to Question 2.

Question 4:

Regarding proposed TS 6.8.4 g.4, the word “outboard” is used in three sentences. In one sentence, the word outboard is used in the context of roll expansions. The meaning of “outboard” seems reasonably clear to the NRC staff based on the context of its use in this sentence. However, the NRC staff is concerned that the words “second (outboard) sleeve roll” in the other two sentences is confusing and could be misinterpreted. Discuss your plans for revising these words to clarify that you are referring to the free span sleeve roll closest to the sleeve end.

DBNPS Response:

Since the only approved sleeving method involves the installation of sleeves at the upper tubesheet, and all sleeves contain three roll expansions (one at the upper end of the sleeve in the tubesheet and two at the lower end of the sleeve), proposed TS 6.8.4.g.4 has been consistently revised to use the phrases “upper-most sleeve roll” and “lower-most sleeve roll” to describe these points of reference in the primary to secondary pressure boundary.

Question 5:

Regarding proposed TS 6.8.4 g.4, the licensee has included the sentence, “For tubes that have undergone repair rolling, the previously existing tube and tube roll, outboard of the new roll area in the tubesheet, can be excluded ...” The words “previously existing” are confusing since this portion of the tube still exists. Discuss whether you intend to revise the sentence to clarify these words. One acceptable alternative is to state, “... the portion of the tube outboard of the new roll area in the tubesheet can be excluded ...”

DBNPS Response:

The phrase “previously existing” was carried over from the current TS. Since it adds nothing to the intended meaning of the associated TS requirements, the phrase has been eliminated throughout the revised proposed TS. In addition, the phrase “future periodic SG tube inspections” was shortened to “inspections” in two locations in TS 6.8.4 g.4 since preceding sentences establish the context of inspections.

Question 6:

Regarding proposed TS 6.8.4 g.4, the licensee has included the sentence, “For tubes that have undergone sleeving repairs, the previously existing parent tube, from the original tubesheet roll expansion to the end of the second (outboard) sleeve roll, can be excluded from future periodic SG tube inspections because it is no longer part of the pressure boundary once the sleeve is installed.” The words “previously existing” are confusing since this portion of the tube still exists. Discuss whether you intend to revise the sentence to clarify these words. One acceptable alternative is to simply to delete the words “previously existing.”

The NRC staff notes that the proposed sentence can be interpreted to mean that the parent tube need not be inspected at the original tubesheet roll expansion or at the two sleeve rolls. If your response to Question 2 above indicates that flaws (of any size) in the parent tube at these locations are potentially relevant to the structural and leakage integrity of the sleeve to tube joints, discuss your plans for providing a revision to the proposed sentence that makes it clear that only the portion of the parent tube between (not including) the upper tubesheet expansion and the closest (inboard) free span sleeve roll is excluded from inspection.

DBNPS Response:

The phrase “previously existing” was carried over from the current TS. Since it adds nothing to the intended meaning of the associated TS requirements, the phrase has been eliminated throughout the revised proposed TS.

Consistent with the original intention to obviate inspection requirements in the non-pressure boundary region of a repaired tube, the proposed TS have been clarified by using sleeve roll terminology described in response to RAI Item 4 to avoid misunderstanding. The revised wording has been clarified to indicate that sections of the parent tube above the upper-most sleeve roll and between the upper-most sleeve roll and the lower-most sleeve roll can be excluded from inspections because they are no longer part of the pressure boundary once the sleeve is installed. Tube above the upper-most sleeve roll may be excluded because the upper-most sleeve roll forms a pressure boundary between the tubesheet, parent tube and sleeve, and the tubesheet is the pressure boundary above the upper-most sleeve roll.

Question 7:

Regarding proposed TS 6.8.4 g.4, the licensee has included the sentence, “The installed sleeve, from the sleeve tubesheet roll expansion to the end of the second (outboard) free span sleeve roll, will be included in future periodic SG tube inspections because it is part of the pressure boundary.” Because of the use of the words “from” and “to,” it is not clear from this sentence whether the inspection is to include the sleeve tubesheet roll expansion and the second (outboard) free span sleeve roll regions. If your response to question 2 indicates that flaws (of any size) in the sleeve at these locations are relevant to the structural and leakage integrity of the tube-to-sleeve joints, discuss your plans for providing a revision to the proposed sentence that clarifies that these locations are to be included in the inspection.

DBNPS Response:

Since the wording provided by the TSTF-449 model requires provisions for a tube to be inspected from end to end for the purpose of detecting flaws that may satisfy applicable tube repair criteria, and revised tube repair criterion TS 6.8.4 g.3.c has been provided for sleeve joints, an additional statement in TS 6.8.4 g.4 requiring inspection of sleeve joints or the sleeve itself would be redundant. Therefore the TSTF wording needs only to be supplemented with plant-specific exceptions to the inspection requirement such as for the parent tube between a sleeve’s joints. The proposed TS have been revised to delete the redundant inspection provision described in this RAI item.

Question 8:

Proposed TS 6.8.4 g.6.b includes the sentence, “The new roll area must be free of degradation in order for the repair to be considered acceptable.” Describe your plans for revising the word “degradation” with the word “flaws,” consistent with TS Task Force Traveler No. 449 and the rest of the proposed TS 6.8.4 g. Does this criterion apply each time a roll joint is inspected or does this criterion only apply at

the time the roll repair is performed? If it applies during each inservice inspection, then this criterion is a tube repair criterion. Describe your plans for moving this criterion to TS 6.8.4 g.3, "Provisions for SG tube repair criteria." If this criterion applies only at the time the roll repair is performed, what is technical justification for allowing a tube with flaws ranging to 40 percent through wall in the roll repair to remain in service?

DBNPS Response:

The proposed wording was extracted from the existing TS for incorporation into wording provided by the TSTF model. The basis for NRC approval of the existing TS requirement (described in License Amendment No. 220 dated April 14, 1998) was that a flaw found during post-installation inspection or during future inservice inspection of a repair roll of a tube would be repaired by a different method or the tube would be plugged. Therefore, the proposed TS have been revised to include this requirement in TS 6.8.4 g.3.d and to revise TS 6.8.4 g.6.b to use the term "flaw" in favor of "degradation."

Question 9:

Proposed TS 6.8.4 g.7 and 6.8.4 g.9 deal with special interest tube inspections. Discuss your plans for moving these requirements to be part of TS 6.8.4 g.4, "Provisions for SG tube inspections."

DBNPS Response:

Proposed TS have been revised to relocate the requirements of TS 6.8.4 g.7 and TS 6.8.4 g.9 to TS 6.8.4 g.4.d and TS 6.8.4 g.4.e, respectively.

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Enclosure 1

**UPDATED PROPOSED MARKUPS
OF
TECHNICAL SPECIFICATION PAGES**

(5 pages follow)

REACTOR COOLANT SYSTEM

OPERATIONAL LEAKAGE

LIMITING CONDITION FOR OPERATION

3.4.6.2 Reactor Coolant System operational leakage shall be limited to:

- a. No PRESSURE BOUNDARY LEAKAGE,
- b. 1 GPM UNIDENTIFIED LEAKAGE,
- c. ~~150 GPD-gallons per day primary to secondary~~ primary to secondary leakage through the tubes of any one steam generator (SG),
- d. 10 GPM IDENTIFIED LEAKAGE from the Reactor Coolant System,
- e. 10 GPM CONTROLLED LEAKAGE, and
- f. 5 GPM leakage from any Reactor Coolant System Pressure Isolation Valve as specified in Table 3.4-2.

APPLICABILITY: MODES 1, 2, 3 and 4

ACTION:

- a. With any PRESSURE BOUNDARY LEAKAGE, or with primary to secondary leakage not within limit, be in at least HOT STANDBY within 6 hours and in COLD SHUTDOWN within the following 30 hours.
- b. With any Reactor Coolant System operational leakage greater than any one of the above limits, excluding PRESSURE BOUNDARY LEAKAGE or primary to secondary leakage, reduce the leakage rate to within limits within 4 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours except as permitted by paragraph c below.
- c. In the event that integrity of any pressure isolation valve specified in Table 3.4-2 cannot be demonstrated, POWER OPERATION may continue, provided that at least two valves in each high pressure line having a non-functional valve are in and remain in, the mode corresponding to the isolated condition.^(a)
- d. The provisions of Section 3.0.4 are not applicable for entry into MODES 3 and 4 for the purpose of testing the isolation valves in Table 3.4-2.

^(a)Motor operated valves shall be placed in the closed position and power supplies deenergized.

ADMINISTRATIVE CONTROLS

6.8.4 (Continued)

f. Ventilation Filter Testing Program (VFTP) (Continued)

below when tested in accordance with ASTM D 3803-1989 at a temperature of 30° C and the relative humidity (RH) specified below.

<u>Safety Related Ventilation System</u>	<u>Penetration</u>	<u>RH</u>
Shield Building Emergency Ventilation System	≤ 2.5%	95%
Control Room Emergency Ventilation System	≤ 2.5%	70%

4. Demonstrate for each of the safety related systems that the pressure drop across the combined HEPA filters, the prefilters, and the charcoal adsorbers is less than the value specified below when tested in accordance with Regulatory Guide 1.52, Revision 2 and ANSI/ASME N510-1980 at the system flowrate specified below, +/- 10%.

<u>Safety Related Ventilation System</u>	<u>Delta P</u>	<u>Flowrate</u>
Shield Building Emergency Ventilation System	6 inches Water Gauge	8000 cfm
Control Room Emergency Ventilation System	4.4 inches Water Gauge	3300 cfm

The provisions of SR 4.0.2 and SR 4.0.3 are applicable to the VFTP test frequencies.

g. Steam Generator (SG) Program

INSERT 6.8.4.g
(attached)

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:

- 1) 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 a SG inspection outage, as determined from the inservice inspection results or by other means, prior to the plugging or repair of tubes. Condition monitoring assessments shall be conducted during each outage during which the SG tubes are inspected, plugged, or repaired to confirm that the performance criteria are being met.
- 2) 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.
 - a. Structural integrity performance criterion: All in-service SG tubes shall retain structural integrity over the full range of normal operating conditions (including startup, operation in the power range, hot standby, and cooldown 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.
 - b. 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, except during a SG tube rupture.
 - c. The operational leakage performance criterion is specified in LCO 3.4.6.2, “Reactor Coolant System Operational Leakage.”

- 3) Provisions for SG tube repair criteria :
- a. Tubes found by inservice inspection to contain flaws, in a region of the tube that contains no repair, with a depth equal to or exceeding 40% of the nominal tube wall thickness shall be plugged or repaired.
 - b. Sleeves found by inservice inspection to contain flaws, in a region of the sleeve that contains no sleeve joint, with a depth equal to or exceeding 40% of the nominal sleeve wall thickness shall be plugged.
 - c. Tubes with a flaw, in either the parent tube or the sleeve, within a sleeve-to-tube joint shall be plugged.
 - d. Tubes with a flaw in a repair roll shall be plugged.
- 4) 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. The tube-to-tubesheet weld is not part of the tube. For tubes that have undergone repair rolling, the tube and tube roll, outboard of the new roll area in the tube sheet, can be excluded from inspections because it is no longer part of the pressure boundary once the repair roll is installed. For tubes that have undergone sleeving repairs, sections of the parent tube above the upper-most sleeve roll and between the upper-most sleeve roll and the lower-most sleeve roll can be excluded from inspections because they are no longer part of the pressure boundary once the sleeve is installed. In addition to meeting the requirements of 4.a through 4.e 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.
- a. Inspect 100% of the tubes in each SG during the first refueling outage following SG replacement.
 - b. Inspect 100% of the tubes at sequential periods of 60 effective full power months. The first sequential period shall be considered to begin after the first inservice inspection of the SGs. No SG shall operate for more than 24 effective full power months or one interval between refueling outages (whichever is less) without being inspected.

- c. 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 interval between refueling outages (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.
 - d. Inspect 100% of the tubes that have been repaired by the repair roll process during each periodic SG tube inspection. This special inspection shall be limited to the repair roll joint and the roll transitions of the repair roll.
 - e. Inspect peripheral tubes in the vicinity of the secured internal auxiliary feedwater header between the upper tube sheet and the 15th tube support plate during each periodic SG tube inspection. The tubes selected for inspection shall represent the entire circumference of the steam generator and shall total at least 150 peripheral tubes.
- 5) Provisions for monitoring operational primary to secondary leakage.
- 6) Provisions for SG tube repair methods: Steam generator tube repair methods shall provide the means to reestablish the RCS pressure boundary integrity of SG tubes without removing the tube from service. For the purposes of these specifications, tube plugging is not a repair. All acceptable tube repair methods are listed below.
- a. Sleeving in accordance with Topical Report BAW-2120P.
 - b. Repair rolling in accordance with Topical Report BAW-2303P, Revision 4. The new roll area must be free of flaws in order for the repair to be considered acceptable.
- 7) Special visual inspections: Visual inspections of the secured internal auxiliary feedwater header, header to shroud attachment welds, and the external header thermal sleeves shall be performed on each SG through the auxiliary feedwater injection penetrations. These inspections shall be performed during the third period of each ten-year Inservice Inspection Interval (ISI).

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Attachment 2
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COMMITMENT LIST

The following list identifies those actions committed to by the Davis-Besse Nuclear Power Station (DBNPS) in this document. Any other actions discussed in the submittal represent intended or planned actions by the DBNPS. They are described only for information and are not regulatory commitments. Please contact Mr. Henry L. Hegrat, Supervisor – FENOC Fleet Licensing, at (330) 374-3114 of any questions regarding this document or any associated regulatory commitments.

COMMITMENT

DUE DATE

None

N/A