Tennessee Valley Authority, Post Office Box 2000, Spring City, Tennessee 37381-2000

JUL 1 1 2003

WBN-TS-02-16

10 CFR 50.90

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

Gentlemen:

In the Matter of) Docket No.50-390
Tennessee Valley Authority)

WATTS BAR NUCLEAR PLANT (WBN) UNIT 1 - PROPOSED LICENSE AMENDMENT REQUEST CHANGE NO. WBN-TS-02-16 - STEAM GENERATOR TUBE REPAIR SLEEVE - RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION (TAC NO. MB 6976)

The purpose of this letter is to provide TVA's response to NRC's request for additional information (RAI) received by electronic mail (e-mail) from NRC Project Manager, M. Chernoff on May 22, 2003. These questions have also been discussed with NRC reviewers in a teleconference call on June 11, 2003.

Enclosure 1 of this letter provides TVA's responses to NRC's questions. Enclosure 2 provides the retyped proposed changes to the technical specification pages. Technical Specification pages from TVA's December 13, 2002 and May 19, 2003 letters which have changed are included in this letter for convenience. In addition to those pages previously provided TVA has referenced Table 5.7.2.12-2 in Sections 5.7.2.12.a and 5.7.2.12.b, (page 5.0-15), 5.7.2.12.d (page 5.0-16) and 5.7.2.12.f.2 and 5.7.2.12.f.3 (page 5.0-17) and referenced Table 5.7.2.12-3 in Section 5.7.2.12.a. Table 5.7.2.12-3 was originally Table 5.7.2.12-2 and has been changed to insert the

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new Table 5.7.2.12-2. These pages are also enclosed in Enclosure 2. In addition, the Staff requested 5.7.2.12.g.1.e be revised to remove the option of considering indications with imperfection depths less than 20 percent through-wall. Therefore, this section was revised to delete "may be considered..." and change to "are to be considered..."

The response and proposed changes to the technical specification are clarifications and no change is warranted to the no significant hazards determination included in TVA's December 13, 2002, letter.

If you have any questions concerning these responses, please contact me at (423) 365-1824.

I declare under penalty of perjury that the foregoing is true and correct. Executed on 11th day of July, 2003.

Sincerely,

P. L. Pace
Manager, Site Licensing
and Industry Affairs

Enclosures
Enclosure 1 - Response to Request for Additional Information
Enclosure 2 - Proposed Technical Specification Revised Pages

JUL 1 1 2003

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ENCLOSURE 1

WATTS BAR NUCLEAR PLANT UNIT 1
WBN-TS-02-16 - STEAM GENERATOR TUBE REPAIR SLEEVE
RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION (RAI)

TVA's response to NRC's RAI received by electronic mail (e-mail) from NRC Project Manager, M. Chernoff on May 22, 2003 is provided below. These questions have also been discussed with NRC reviewers in a teleconference call on June 11, 2003.

QUESTION 1

In the proposed technical specification (TS) 5.7.2.12.g.1.f, it is stated that "...This definition does not apply to the portion of the original tube in the tubesheet below the F* distance provided the tube is not degraded within the distance for F* tube..."

The above definition could be interpreted that if an F* tube is sleeved inside the tubesheet, there will be no plugging limit applied to flaws detected in the parent tube in, or below, the sleeve-tube joint which is below the F* distance. This would imply that a flaw is allowed to exist in the pressure boundary, as defined on page 5-5 of WCAP-15918-P.

Please discuss the appropriate plugging limit for flaws in this region of the F* tube. If flaws are permitted, discuss the technical basis. If flaws are not permitted, discuss your plans to modify the TS.

RESPONSE:

The attached Insert A for the technical specification page and the revised page in Enclosure 2 has been revised per NRC request to clarify the plugging limits for a sleeved tube and the original tube, separately.

QUESTION 2

On page 5.0-19 of the TS, there are two references to TS 5.7.2.12.g.1.1. Please clarify whether this is a typographical error.

RESPONSE:

This is a typographical error. See revised technical specification page 5.0-19a in Enclosure 2.

QUESTION 3

TS 5.7.2.12.g.1.m. It is stated that "...Tube Repair refers to a process that reestablishes tube serviceability. Tube repair of defective tubes will be performed where applicable by installation of the Westinghouse Alloy 800 leak-limiting repair sleeve..."

The staff suggests that the phrase, "where applicable", be removed or clarified since the intent of this phrase is not clear. The staff also suggests that the licensee include in the TS dates of its response letters to the staff's requests for additional information because all documents reflect the technical basis for the sleeving amendment.

RESPONSE:

The phrase "where applicable" has been deleted. See the attached revised Insert C to the technical specification and the Enclosure 2 revised Technical Specification page. TVA prefers to incorporate the references into the UFSAR as incorporated for the F* and ODSCC alternate repair criteria. The references for those approved SG documents are not in the technical specification however, are referenced in the UFSAR (See UFSAR Section 5.5.2.4)

WESTINGHOUSE TOPICAL REPORT: WCAP-15918-P

QUESTION 4

The staff has questions regarding eddy current probe inspection.

A. On the top of Page 5-3, it is stated that "...the inspection detection capability has been demonstrated separately for the sleeve and tube, using the appropriate flaw sizes for the specific pressure boundary thickness..." Please clarify whether the eddy current techniques were qualified to detect cracks given the sleeve/tube configuration. For example, were flaws simulated in the parent tube at the location of the

sleeve-tube joints? If not, discuss the basis (including test data) supporting that flaws can be reliably detected given the sleeve/tube configuration. Please discuss the number of sleeve/tube samples that had stress corrosion cracking flaws and the detection capability for these flaws.

B. On Page 5-2, it is stated that the flaw detection capability was demonstrated for flaws greater than or equal to 50 percent through-wall for the tube and 45 percent for the sleeve. The structural limit for the sleeve was calculated to be 48 percent through-wall based on cracking. On page E1-7 of Enclosure 1 to the December 13, 2002, submittal, the licensee stated that the degradation in Alloy 800 material has been due to wall thinning/wastage and wear. Given that one of the degradation mechanisms that could affect the sleeve is wall thinning, discuss what the structural limit is for sleeve wall thinning and whether the techniques to be used during the inspections are qualified to detect degradation at or below the wall thinning structural limit.

RESPONSE:

A. The statement that "…the inspection detection capability has been demonstrated separately…" explains that the size of the flaws used in each component were determined based on the specific wall thickness/minimum allowable degradation for that component alone without structural reinforcement provided by the other. As stated in Section 5.2, the qualification program was performed on actual sleeve/tube assemblies that included electric discharge machined (EDM) notches and drilled flaws in both components at each of the transitions and expansion zones, i.e. joints, to the depths described. The qualification program included fifty-five EDM and drilled flaws in sleeve/tube assemblies with hydraulic expansion and rolled joints. The flaws were at various locations in the sleeves or tubes. Additionally, the qualification included four specimens with sixteen laboratory grown stress corrosion cracks.

B. The structural limit for the sleeve, as stated on page 5-2, is for cracking as this is the worst case and most likely degradation mechanism with forty-eight percent wall degradation allowed. General wall thinning due to wear/wastage would allow an even greater reduction in

wall thickness of fifty-five percent. Calculation of the allowable degradation for both modes is described in Section 8.2 of WCAP-15918. Sufficient sensitivity to volumetric type flaws such as general wall thinning is demonstrated by detection of the calibration standard American Society of Mechanical Engineers (ASME) machined flaws in both the sleeve and parent tube.

QUESTION 5

Page 7-11. Regarding the assessment of leakage under post accident conditions,

A. Discuss what leak rate will be used in assessing the leakage from sleeve joints and how many sleeves will be considered to be leaking. If all sleeves are not considered to be leaking, discuss your technical basis

B. Confirm whether the leakage attributed to the sleeves will be combined with other sources of leakage for comparisons to the leakage limits.

RESPONSE:

A. The design basis leak rates in WCAP-15918-P, Section 7.3.1 (page 7-10), for the accident conditions specified, are provided to assess the leakage from sleeve joints.

Leakage values which will be used are from the table in the WCAP, (page 7-10) which represent the upper 95 percent confidence limit on the mean value of leakage for appropriate temperature and pressure conditions.

B. WBN plant staff determines the total number of sleeves which can be installed given other sources of leakage from the steam generators, such as calculated leakage from alternate repair criteria. Each sleeved tube will be considered to be leaking. The sum of the postulated leakage from all sources can not exceed the current design basis accident leakage rate of one gallon per minute.

ENCLOSURE 1
ATTACHMENT

WATTS BAR NUCLEAR PLANT UNIT 1
TECHNICAL SPECIFICATION WBN-TS-02-16

REVISED INSERTS

INSERT A:

f) Plugging Limit - The imperfection depth at or beyond which the tube shall be removed from service by plugging, or repaired by sleeving in the affected area. The plugging and repair criteria are specified as follows:

A sleeved tube shall be plugged if an imperfection is detected in a Westinghouse Alloy 800 leak-limiting sleeve.

A sleeved tube shall be plugged if an imperfection is detected in the pressure boundary portion of the original tube wall in the Westinghouse Alloy 800 leak-limiting sleeve/tube assembly (i.e., at the sleeve-tube joint(s)).

A tube shall be plugged or repaired if the depth of an imperfection in the original tube wall is greater than or equal to 40% of the nominal wall. This definition does not apply to imperfections detected in the non-pressure boundary portion of the original tube wall associated with a sleeve. This definition does not apply to the portion of the original tube in the tubesheet below the F* distance provided the tube does not have a sleeve installed in the tubesheet region and the tube is not degraded within the F* distance.

INSERT B

Deleted in May 19, 2003 letter to NRC responding to the request for additional information.

INSERT C:

m) Tube Repair refers to a process that reestablishes tube serviceability. Tube repair of defective tubes will be performed ~~where applicable~~ by installation of the Westinghouse Alloy 800 leak-limiting repair sleeve as described in the proprietary Westinghouse Report WCAP-15918-P, Revision 00 (Draft CEN-633-P, Revision 05-P), "Steam Generator Tube Repair For Combustion Engineering and Westinghouse Designed Plants with ¾ Inch Inconel 600 Tubes Using Leak Limiting Alloy 800 Sleeves."

ENCLOSURE 2

TENNESSEE VALLEY AUTHORITY
WATTS BAR NUCLEAR PLANT (WBN)
UNIT 1

PROPOSED TECHNICAL SPECIFICATION CHANGES - WBN-TS-02-16
REVISED PAGES

I. AFFECTED PAGE LIST:

5.0-15
5.0-16
5.0-17
5.0-18
5.0-19
5.0-19a (rolled page)
5.0-19b (rolled page)
5.0-19c
5.0-20
5.0-20a
5.0-21

ENCLOSURE 2

TENNESSEE VALLEY AUTHORITY
WATTS BAR NUCLEAR PLANT (WBN)
UNIT 1

PROPOSED TECHNICAL SPECIFICATION CHANGES - WBN-TS-02-16
REVISED PAGES

I. AFFECTED PAGE LIST:

5.0-15
5.0-16
5.0-17
5.0-18
5.0-19
5.0-19a (rolled page)
5.0-19b (rolled page)
5.0-19c
5.0-20
5.0-20a
5.0-21

5.7 Procedures, Programs, and Manuals

5.7.2.12 Steam Generator (SG) Tube Surveillance Program

Each steam generator (SG) shall be demonstrated OPERABLE by performance of the following augmented inservice inspection program in addition to the provisions for inservice inspection of ASME Code Class 1, 2, and 3 components which shall be performed in accordance with Section XI of the ASME Boiler and Pressure Vessel Code and applicable Addenda as required by 10 CFR 50.55a. See Specification 5.7.2.11 for applicable inspection Frequencies.

a. SG Sample Selection and Inspection - Each SG shall be determined OPERABLE during shutdown by selecting the number of steam generators according to Table 5.7.2.12-3 and inspecting at least the minimum number of SG tubes specified in Tables 5.7.2.12-1 and 5.7.2.12-2.

b. SG Tube Sample Selection and Inspection - The SG tube minimum sample size, inspection result classification, and the corresponding action required shall be as specified in Tables 5.7.2.12-1 and 5.7.2.12-2. The inservice inspection of SG tubes shall be performed at the frequencies specified in Specification 5.7.2.12.f and the inspected tubes shall be verified acceptable per the acceptance criteria of Specification 5.7.2.12.g. The tubes selected for each inservice inspection shall include at least 3% of the total number of tubes in all SGs; the tubes selected for these inspections shall be selected on a random basis except:

1. Where experience in similar plants with similar water chemistry indicates critical areas to be inspected, then at least 50% of the tubes inspected shall be from the critical areas;

2. The first sample of tubes selected for each inservice inspection (subsequent to the preservice inspection) of each SG shall include:

a) All nonplugged tubes that previously had detectable wall penetrations (greater than 20%),

b) Tubes in those areas where experience has indicated potential problems,

c) A tube inspection (pursuant to Specification 5.7.2.12.g) shall be performed on each selected tube. If any selected tube does not permit the passage of the eddy current probe for a tube inspection, this shall be recorded and an adjacent tube shall be selected and subjected to a tube inspection, and

(continued)

5.7 Procedures, Programs, and Manuals

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

d) In addition to the samples required in 5.7.2.12.b.2.a) through c), all tubes which have had the F* criterion applied will be inspected in the tubesheet region. These F* tubes may be excluded from 5.7.2.12.b.2.a, provided the only previous wall penetration of greater than 20% was located below the F* distance of 1.40 inches (which includes NDE uncertainty) extending from either the bottom of the steam generator tube roll transition or the top of the tubesheet, whichever is lower in elevation.

e) Indications left in service at the flow distribution baffles and tube support plate elevations as a result of the application of the tube support plate voltage repair criteria shall be inspected by bobbin probe during all future refueling outages.

c. Examination Results - The results of each sample inspection shall be classified into one of the following three categories:

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.
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d. Supplemental Sampling Requirements - The tubes selected as the second and third samples (if required by Tables 5.7.2.12-1 and 5.7.2.12-2) may be subjected to a partial tube inspection provided:

1. 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

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

(continued)

5.7 Procedures, Programs, and Manuals

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

e. Supplemental Inspection Requirements - Implementation of the steam generator tube to tube support plate repair criteria requires a 100-percent bobbin coil inspection for hot-leg and cold-leg tube support plate intersections (including the flow distribution baffles) down to the lowest cold-leg tube support plate with known outside diameter stress corrosion cracking (ODSCC) indications. The determination of the lowest cold-leg tube support plate intersections having ODSCC indications shall be based on the performance of at least a 20-percent random sampling of tubes inspected over their full length.

f. Inspection frequency - The above required inservice inspections of the SG tubes shall be performed at the following frequencies:

1. The first inservice inspection shall be performed after 6 effective full power months but within 24 calendar months of initial criticality. Subsequent inservice inspections shall be performed at intervals of not less than 12 nor more than 24 calendar months after the previous inspection. If two consecutive inspections, not including the preservice inspection, result in all inspection results falling into the C-1 category or if two consecutive inspections demonstrate that previously observed degradation has not continued and no additional degradation has occurred, the inspection interval may be extended to a maximum of once per 40 months;

2. If the results of the inservice inspection of a SG conducted in accordance with Tables 5.7.2.12-1 and 5.7.2.12-2 at 40-month intervals fall in Category C-3, the inspection frequency shall be increased to at least once per 20 months. The increase in inspection frequency shall apply until the subsequent inspections satisfy the criteria of Specification 5.7.2.12.f.1; the interval may then be extended to a maximum of once per 40 months; and

3. Additional, unscheduled inservice inspections shall be performed on each SG in accordance with the first sample inspection specified in Tables 5.7.2.12-1 and 5.7.2.12-2 during the shutdown subsequent to any of the following conditions:

a) Primary-to-secondary tube leaks (not including leaks originating from tube-to-tube sheet welds) in excess of the limits of Specification 3.4.13, or

b) A seismic occurrence greater than the Operating Basis Earthquake, or

(continued)

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

c) A loss-of-coolant accident requiring actuation of the Engineered Safety Features, or

d) A main steam line or feedwater line break.

g. Acceptance Criteria

1. Terms as used in this specification will be defined as follows:

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

b) Degraded Tube - A tube containing imperfections greater than or equal to 20% of the nominal wall thickness caused by degradation;

c) % Degradation - The percentage of the tube wall thickness affected or removed by degradation;

d) Defect - An imperfection of such severity that it exceeds the plugging limit. A tube containing a defect is defective;

e) Imperfection - 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, are to be considered as imperfections;

f) Plugging Limit - The imperfection depth at or beyond which the tube shall be removed from service by plugging, or repaired by sleeving in the affected area. The plugging and repair criteria are specified as follows:

A sleeved tube shall be plugged if an imperfection is detected in a Westinghouse Alloy 800 leak-limiting sleeve.

A sleeved tube shall be plugged if an imperfection is detected in the pressure boundary portion of the original tube wall in the Westinghouse Alloy 800 leak-limiting sleeve/tube assembly (i.e., at the sleeve-tube joint(s)).

A tube shall be plugged or repaired if the depth of an imperfection in the original tube wall is greater than or equal to 40% of the nominal wall. This definition does not apply to imperfections detected in the non-pressure boundary portion

(Continued)

5.7 Procedures, Programs, and Manuals

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

of the original tube wall associated with a sleeve. This definition does not apply to the portion of the original tube in the tubesheet below the F* distance provided the tube does not have a sleeve installed in the tubesheet region and the tube is not degraded within the F* distance.

For tubes to which the F* criteria is applied, a minimum of 1.5 inches of the tube into the tubesheet from the top of the tubesheet or from the bottom of the roll transition, whichever is lower in elevation, shall be inspected using rotating pancake coil eddy current technique oran inspection method shown to give equivalent or better information on the orientation and length of cracking. A minimum of 1.40 inches (which includes NDE uncertainty) of continuous, sound expanded tube must be established, extending from either the bottom of the roll transition or the top of the tubesheet, whichever is lower in elevation, to the uppermost extent of the indication.

This definition does not apply to flow distribution baffles and tube support plate intersections for which the voltage-based repair criteria are being applied. Refer to Specification 5.7.2.12.g.1.1 for repair limit applicable to these intersections.

g) Preservice Inspection - An inspection of the full length of each tube in each SG performed by eddy current techniques prior to service to establish a baseline condition of the tubing. This inspection shall be performed prior to initial MODE 1 operation using the equipment and techniques expected to be used during subsequent inservice inspections.

h) Tube Inspection - An inspection of the SG tube from the point of entry (hot leg side) completely around the U-bend to the top support of the cold leg.

i) Unserviceable - The condition of a tube if it leaks or contains a defect large enough to affect its structural integrity in the event of an Operational Basis Earthquake, a loss-of-coolant accident, or a steam line or feedwater line break accident as specified in Specification 5.7.2.12.f.

(Continued)

5.7 Procedures, Programs, and Manuals

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

j) F* Distance is the distance into the tubesheet from the bottom of the steam generator tube roll transition or the top of the tubesheet, whichever is lower in elevation (further into the tubesheet), that has been conservatively chosen to be 1.40 inches (which includes NDE uncertainty).

k) F* Tube is the tube with degradation equal to or greater than 40%, below the F* distance and not degraded (i.e., no indications of degradation) within the F* distance.

l) The Tube Support Plate Repair Limit - The Tube Support Plate Repair Limit is used for the disposition of Alloy 600 steam generator tubes for continued service that are experiencing predominantly axially oriented outside diameter stress corrosion cracking confined within the thickness of the tube support plates and flow distribution baffle (FDB). At tube support plate intersections (and FDB), the repair limit is based on maintaining steam generator tube serviceability as described below:

1. Steam generator tubes, whose degradation is attributed to outside diameter stress corrosion cracking within the bounds of the flow distribution baffles and tube support plates with bobbin voltages less than or equal to the lower voltage repair limit of 1.0 volt will be allowed to remain in service.

2. Steam generator tubes, whose degradation is attributed to outside diameter stress corrosion cracking within the bounds of the flow distribution baffles and tube support plates with the bobbin voltage greater than the lower voltage repair limit of 1.0 volt, will be repaired, except as noted in Specification 5.7.2.12.g.1.1.3 below.

3. Steam generator tubes with indications of potential degradation attributed to outside diameter stress corrosion cracking within the bounds of the flow distribution baffles

(continued)

5.7 Procedures, Programs, and Manuals

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

and tube support plates with a bobbin voltage greater than the lower voltage repair limit of 1.0 volt but less than or equal to the upper voltage limit*, may remain inservice if a rotating pancake coil inspection does not detect degradation. Steam generator tubes, with indications of outside diameter stress corrosion cracking degradation with a bobbin voltage greater than the upper voltage repair limit* will be plugged or repaired.

4. Certain intersections as identified in Attachment 2 of WAT-D-10709 ("Tennessee Valley Authority, Watts Bar Nuclear Power Plant Unit 1, Application for Implementation of Voltage Based Repair Criteria, Westinghouse Steam Generator Tubes Affected by ODSCC at TSPs," J. W. Irons, Revision 0, 1/12/00) will be excluded from application of the voltage-based repair criteria as it is determined that these intersection may collapse or deform following a postulated LOCA + SSE event.

5. If an unscheduled mid-cycle inspection is performed, the following mid-cycle repair limits apply instead of the limits identified in 5.7.2.12.g.1.1.1, 5.7.2.12.g.1.1.2, and 5.7.2.12.g.1.1.3.

The mid-cycle repair limits are determined from the following equations:

$$V_{MURL} = \frac{V_{SL}}{1.0 + NDE + Gr\left\lceil \frac{CL - \Delta t}{CL} \right\rfloor}$$

$$V_{MLRL} = V_{MURL} - (V_{URL} - V_{LRL})\left\lceil \frac{CL - \Delta t}{CL} \right\rfloor$$

where:

V_{URL} = upper voltage repair limit
V_{LRL} = lower voltage repair limit
V_{MURL} = mid-cycle upper voltage repair limit based on time into cycle
V_{MLRL} = mid-cycle lower voltage repair limit based on V_{MURL} and time into cycle

(continued)

5.7 Procedures, Programs, and Manuals

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

Δt = length of time since last scheduled inspection during which V_{URL} and V_{LRL} were implemented
CL = cycle length (the time between two scheduled steam generator inspections)
V_{SL} = structural limit voltage
Gr = average growth rate per cycle length
NDE = 95-percent cumulative probability allowance for nondestructive examination uncertainty (i.e. a value of 20-percent has been approved by the NRC).

Implementation of these mid-cycle repair limits should follow the same approach used in specifications 5.7.2.12.g.1.1.1, 5.7.2.12.g.1.1.2, and 5.7.2.12.g.1.1.3.

* The upper voltage repair limit is calculated according to the methodology in GL 95-05 as supplemented. V_{URL} will differ at the tube support plates and flow distribution baffle.

m) Tube Repair refers to a process that reestablishes tube serviceability. Tube repair of defective tubes will be performed by installation of the Westinghouse Alloy 800 leak-limiting repair sleeve as described in the proprietary Westinghouse Report WCAP-15918-P, Revision 00, (Draft CEN-633-P, Revision 05-P), "Steam Generator Tube Repair For Combustion Engineering and Westinghouse Designed Plants with ¾ Inch Inconel 600 Tubes Using Leak Limiting Alloy 800 Sleeves."

2. The SG shall be determined OPERABLE after completing the corresponding actions (plug or repair all tubes exceeding the plugging limit and all tubes containing through-wall cracks) required by Tables 5.7.2.12-1 and 5.7.2.12-2.

h. Reports - The content and frequency of written reports shall be in accordance with Specification 5.9.9.

5.7 Procedures, Programs, and Manuals (continued)

TABLE 5.7.2.12-1

STEAM GENERATOR TUBE INSPECTION
SUPPLEMENTAL SAMPLING REQUIREMENTS

1st Sample Inspection			2nd Sample Inspection		3rd Sample Inspection	
Sample Size	Result	Action Required	Result	Action Required	Result	Action Required
A minimum of S tubes per SG	C-1	None	N/A	N/A	N/A	N/A
	C-2	Plug or Repair defective tubes and inspect an additional 2S tubes in this SG.	C-1	None	N/A	N/A
			C-2	Plug or Repair defective tubes and inspect an additional 4S tubes in this SG.	C-1	N/A
					C-2	Plug or Repair defective tubes.
					C-3	Perform action for C-3 result of first sample.
			C-3	Perform action for C-3 result of first sample.	N/A	N/A
	C-3	Inspect all tubes in this SG, plug or repair defective tubes and inspect 2S tubes in each other SG. Notification to NRC pursuant to 10CFR50.72	All other SGs C-1	None	N/A	N/A
			Some SGs C-2 but no other is C-3	Perform action for C-2 result of second sample.	N/A	N/A
			Additional SG is C-3	Inspect all tubes in each SG and plug or repair defective tubes. Notification to NRC pursuant to 10CFR50.72.	N/A	N/A

$S = 3 N/n$ Where N is the number of SGs in the unit and n is the number of S.G.s inspected during an inspection.

5.7 Procedures, Programs, and Manuals (continued)

TABLE 5.7.2.12-2

STEAM GENERATOR REPAIRED TUBE INSPECTION
SAMPLING REQUIREMENTS

1st Sample Inspection			2nd Sample Inspection	
Sample Size	Result	Action Required	Result	Action Required
A minimum of 20% of repaired tubes	C-1	None	N/A	N/A
	C-2	Plug defective repaired tubes and inspect 100% of the repaired tubes in this SG	C-1	None
			C-2	Plug defective repaired tubes
			C-3	Perform action for C-3 result of first sample.
	C-3	Inspect all repaired tubes in this SG, plug defective repaired tubes and inspect 20% of the repaired tubes in each other SG. Notification to NRC pursuant to 10CFR50.72	All other SGs C-1	None
			Some SGs C-2 but no other is C-3	Perform action for C-2 result of first sample.
			Additional SG is C-3	Inspect all repaired tubes in each SG and plug defective repaired tubes. Notification to NRC pursuant to 10CFR50.72.

5.7 Procedures, Programs, and Manuals (continued)

TABLE 5.7.2.12-3

MINIMUM NUMBER OF STEAM GENERATORS TO BE INSPECTED DURING INSERVICE INSPECTION

Preservice Inspection	All
First Inservice Inspection	Two
Second and Subsequent Inservice Inspections	One[1]

1. The inservice inspection may be limited to one SG on a rotating schedule encompassing 3 N % of the tubes (where N is the number of SGs in the plant) if the results of the first or previous inspections indicate that all SGs are performing in a like manner. Note that under some circumstances, the operating conditions in one or more SGs may be found to be more severe than those in other SGs. Under such circumstances the sample sequence shall be modified to inspect the most severe conditions.

   One of the other two SGs not inspected during the first inservice inspections shall be inspected during the second inspection period and the remaining SG shall be inspected during the third inspection period. The fourth and subsequent inspections shall follow the instructions described above.

5.7.2.13 Secondary Water Chemistry Program

This program provides controls for monitoring secondary water chemistry to inhibit SG tube degradation and low pressure turbine disc stress corrosion cracking. The program shall include:

a. Identification of a sampling schedule for the critical variables and control points for these variables;

b. Identification of the procedures used to measure the values of the critical variables;

c. Identification of process sampling points, which shall include monitoring the discharge of the condensate pumps for evidence of condenser in leakage;

(continued)