

ATTACHMENT 2 TO AEP:NRC:1129E

MARKED UP PAGES OF THE CURRENT
TECHNICAL SPECIFICATION PAGES

(9508090217 950804
PDR ADDCK 05000315
P PDR

REACTOR COOLANT SYSTEM

SURVEILLANCE REQUIREMENTS (Continued)

4.4.5.4 Acceptance Criteria

a. As used in this Specification:

1. Imperfection means an exception to the dimensions, finish or contour of a tube or sleeve from that required by fabrication drawings or specifications. Eddy-current testing indications below 20% of the nominal tube wall thickness, if detectable, may be considered as imperfections.
2. Degradation means a service-induced cracking, wastage, wear or general corrosion occurring on either inside or outside of a tube or sleeve.
3. Degraded Tube or Sleeve means an imperfection greater than or equal to 20% of the nominal wall thickness caused by degradation.
4. Percent Degradation means the amount of the tube wall thickness affected or removed by degradation.
5. Defect means an imperfection of such severity that it exceeds the repair limit.
6. Repair/Plugging Limit means the imperfection depth at or beyond which the tube or sleeved tube shall be repaired or removed from service. Any tube which, upon inspection, exhibits tube wall degradation of 40 percent or more of the nominal tube wall thickness shall be plugged or repaired prior to returning the steam generator to service. This definition does not apply to the portion of the tube in the tubesheet below the F* distance for F* tubes. Any sleeve which, upon inspection, exhibits wall degradation of 29 percent or more of the nominal wall thickness shall be plugged prior to returning the steam generator to service. In addition, any sleeve exhibiting any measurable wall loss in sleeve expansion transition or weld zones shall be plugged. This definition does not apply for tubes experiencing outer diameter stress corrosion cracking confirmed by bobbin probe inspection to be within the thickness of the tube support plates. See 4.4.5.4.a.10 for the plugging limit for use within the thickness of the tube support plate.
7. Unserviceable describes the condition of a tube or sleeve if it leaks or contains a defect large enough to affect its structural integrity in the event of an Operating Basis Earthquake, a loss-of-coolant accident, or a steam line or feedwater line break as specified in 4.4.5.3.c, above.
8. Inspection determines the condition of the steam generator tube or sleeve from the point of entry (hot leg side) completely

INSERT A

MOVE

This definition does not apply to parent tube wall degradation in hybrid expansion joint (HEJ) sleeved tubes for the tube evaluation in the free span (upper) HEJ hardroll area. See 4.4.5.4.a.13 below for the plugging limits for the HEJ sleeved tubes in the free span HEJ hardroll region.

REACTOR COOLANT SYSTEM

SURVEILLANCE REQUIREMENTS (Continued)

around the U-bend to the top support of the cold leg. For a tube in which the tube support plate elevation interim plugging limit has been applied, the inspection will include all the hot leg intersections and all cold leg intersections down to, at least, the level of the last crack indication.

9. Sleeving a tube is permitted only in areas where the sleeve spans the tubesheet area and whose lower joint is at the primary fluid tubesheet face.
10. The Tube Support Plate Interim Plugging Criteria is used for disposition of a steam generator tube for continued service that is experiencing outer diameter initiated stress corrosion cracking confined within the thickness of the tube support plates. For application of the tube support plate interim plugging limit, the tube's disposition for continued service will be based upon standard bobbin probe signal amplitude. The plant-specific guidelines used for all inspections shall be amended as appropriate to accommodate the additional information needed to evaluate tube support plate signals with respect to the above voltage/depth parameters. Pending incorporation of the voltage verification requirements in ASME standard verifications, an ASME standard calibrated against the laboratory standard will be utilized in the Donald C. Cook Nuclear Plant Unit 1 steam generator inspections for consistent voltage normalization.

INSERT B

1. A tube can remain in service if the signal amplitude of a crack indication is less than or equal to 2.0 volt, regardless of the depth of tube wall penetration, if, as a result, the projected end-of-cycle distribution of crack indications is verified to result in primary-to-secondary leakage less than 12.6 gpm in the faulted loop during a postulated steam line break event. The methodology for calculating expected leak rates from the projected crack distribution must be consistent with WCAP-13187, Rev. 0, and as prescribed in draft NUREG-1477.
 2. A tube should be plugged or repaired if the signal amplitude of the crack indication is greater than 2.0 volt except as noted in 4.4.5.4.a.10.3 below.
 3. A tube can remain in service with a bobbin coil signal amplitude greater than 2.0 volt but less than or equal to 3.6 volts if a rotating pancake probe inspection does not detect degradation. Indications of degradation with a bobbin coil signal amplitude greater than 3.6 volts will be plugged or repaired.
11. F* Distance is the distance from the bottom of the hardroll transition toward the bottom of the tubesheet that has been conservatively determined to be 1.11 inches (not including eddy current uncertainty).
 12. F* Tube is a tube with degradation, below the F* distance, equal to or greater than 40%, and not degraded (i.e., no indications of cracking) within the F* distance.

INSERT C (ADD 13)

(including sleeved tube leakage allowance as discussed in 4.4.5.4a.13 below)

13. The HEJ Sleeved Tube Repair Boundary is used for disposition of parent tube wall degradation in HEJ sleeved tubes in or below the free span (upper) HEJ hardroll area. The dimensions specified below do not include eddy current uncertainty.
 1. HEJ sleeved tubes with circumferential indications located from 1.1 inches to 1.3 inches (inclusive) below the bottom of the free span HEJ hardroll upper transition may remain in service provided the faulted loop SLB leakage limit of 12.6 gpm from all sources is not exceeded. A SLB leakage of 0.033 gpm shall be assumed for each indication, regardless of the actual indication length or depth.
 2. HEJ sleeved tubes with circumferential and/or axial indications whose upper most extent is located greater than 1.3 inches below the bottom of the free span HEJ hardroll upper transition may remain in service.
 3. HEJ sleeved tubes with axial indications whose upper most extent is located less than or equal to 1.3 inches below the bottom of the free span HEJ hardroll upper transition shall be plugged.



REACTOR COOLANT SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

- b. The steam generator shall be determined OPERABLE after completing the corresponding actions (plugging or sleeving all tubes exceeding the repair limit and all tubes containing through-wall cracks) required by Table 4.4-2.
- c. Steam generator tube repairs may be made in accordance with the methods described in either WCAP-12623 or CEN-313-P.

4.4.5.5 Reports

- a. Following each inservice inspection of steam generator tubes, if there are any tubes requiring plugging or sleeving, the number of tubes plugged or sleeved in each steam generator shall be reported to the Commission within 15 days.
- b. The complete results of the steam generator tube inservice inspection shall be included in the Annual Operating Report for the period in which this inspection was completed. This report shall include:
 - 1. Number and extent of tubes inspected.
 - 2. Location and percent of wall-thickness penetration for each indication of an imperfection.
 - 3. Identification of tubes plugged or sleeved.
- c. Results of steam generator tube inspections which fall into Category C-3 and require prompt notification of the Commission shall be reported pursuant to Specification 6.9.1 prior to resumption of plant operation. The written followup of this report shall provide a description of investigations conducted to determine cause of the tube degradation and corrective measures taken to prevent recurrence.
- d. The results of inspections performed under 4.4.5.2 for all tubes in which the tube support plate interim plugging criteria has been applied or that have defects below the F* distance and were not plugged shall be reported to the Commission within 15 days following the inspection. The report shall include:
 - 1. Listing of applicable tubes.
 - 2. Location (applicable intersections per tube) and extent of degradation (voltage).
- e. The results of steam line break leakage analysis performed under T/S 4.4.5.4.a.10 will be reported to the Commission prior to restart for Cycle 14.

15. AND T/S 4.4.5.4. and 13.

REACTOR COOLANT SYSTEM

BASES

Degraded steam generator tubes may be repaired by the installation of sleeves which span the section of degraded steam generator tubing. A steam generator tube with a sleeve installed meets the structural requirements of tubes which are not degraded.

To determine the basis for the sleeve plugging limit, the minimum sleeve wall thickness was calculated in accordance with Draft Regulatory Guide 1.121 (August 1976). In addition, a combined allowance of 20 percent of wall thickness is assumed for eddy current testing inaccuracies and continued operational degradation per Draft Regulatory Guide 1.121 (August 1976).

INSERT
D

The following sleeve designs have been found acceptable by the NRC staff:

1. Westinghouse Mechanical Sleeves (WCAP-12623)
2. Combustion Engineering Leak Tight Sleeves (CEN-313-P)

Descriptions of other future sleeve designs shall be submitted to the NRC for review and approval in accordance with 10CFR50.90 prior to their use in the repair of degraded steam generator tubes. The submittals related to other sleeve design shall be made at least 90 days prior to use.

REACTOR COOLANT SYSTEM

BASES

3/4.4.6 REACTOR COOLANT SYSTEM LEAKAGE

3/4.4.6.1 LEAKAGE DETECTION SYSTEMS

The RCS leakage detection systems required by this specification are provided to monitor and detect leakage from the Reactor Coolant Pressure Boundary. These detection systems are consistent with the recommendations of Regulatory Guide 1.45, "Reactor Coolant Pressure Boundary Leakage Detection Systems," May 1973.

3/4.4.6.2 OPERATIONAL LEAKAGE

Industry experience has shown that while a limited amount of leakage is expected from the RCS, the unidentified portion of this leakage can be reduced to a threshold value of less than 1 gpm. This threshold value is sufficiently low to ensure early detection of additional leakage.

The 10 GPM IDENTIFIED LEAKAGE limitations provides allowance for a limited amount of leakage from known sources whose presence will not interfere with the detection of UNIDENTIFIED LEAKAGE by the leakage detection systems.

The limitation on seal line resistance ensures that the seal line resistance is greater than or equal to the resistance assumed in the minimum safeguards LOCA analysis. This analysis assumes that all of the flow that is diverted from the boron injection line to the seal injection line is unavailable for core cooling.

14446

The repair boundary for parent tube degradation in the upper joint region of hybrid expansion joint (HEJ) sleeved tubes is outlined in WCAP-1446. The repair boundary maintains structural integrity consistent with Draft Regulatory Guide 1.121 (August 1976). Application of the repair boundary for indications in the hardroll lower transition provides allowance for leakage in the faulted loop during a postulated steam line break (SLB) event. A SLB leakage of 0.033 gpm is assumed for each applicable indication. SLB leakage from all sources must be calculated to be less than 12.6 gpm in the faulted loop. Maintenance of the 12.6 gpm limit ensures offsite doses will remain within 10% of the 10 CFR 100 guidelines for a SLB.

ATTACHMENT 3 TO AEP:NRC:1129E

PROPOSED REVISED TECHNICAL SPECIFICATION PAGES



3/4 LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS
3/4.4 REACTOR COOLANT SYSTEM

SURVEILLANCE REQUIREMENTS

4.4.5.4 Acceptance Criteria

a. As used in this Specification:

1. Imperfection means an exception to the dimensions, finish or contour of a tube or sleeve from that required by fabrication drawings or specifications. Eddy-current testing indications below 20% of the nominal tube wall thickness, if detectable, may be considered as imperfections.
2. Degradation means a service-induced cracking, wastage, wear or general corrosion occurring on either inside or outside of a tube or sleeve.
3. Degraded Tube or Sleeve means an imperfection greater than or equal to 20% of the nominal wall thickness caused by degradation.
4. Percent Degradation means the amount of the tube wall thickness affected or removed by degradation.
5. Defect means an imperfection of such severity that it exceeds the repair limit.
6. Repair/Plugging Limit means the imperfection depth at or beyond which the tube or sleeved tube shall be repaired or removed from service. Any tube which, upon inspection, exhibits tube wall degradation of 40 percent or more of the nominal tube wall thickness shall be plugged or repaired prior to returning the steam generator to service. This definition does not apply to the portion of the tube in the tubesheet below the F* distance for F* tubes. This definition does not apply to parent tube wall degradation in hybrid expansion joint (HEJ) sleeved tubes for the tube elevation in the free span (upper) HEJ hardroll area. See 4.4.5.4.a.13 below for the plugging limits for the HEJ sleeved tubes in the free span HEJ hardroll region. This definition does not apply for tubes experiencing outer diameter stress corrosion cracking confirmed by bobbin probe inspection to be within the thickness of the tube support plates. See 4.4.5.4.a.10 for the plugging limit for use within the thickness of the tube support plate. Any sleeve which, upon inspection, exhibits wall degradation of 29 percent or more of the nominal wall thickness shall be plugged prior to returning the steam generator to service. In addition, any sleeve exhibiting any measurable wall loss in sleeve expansion transition or weld zones shall be plugged.
7. Unserviceable describes the condition of a tube or sleeve if it leaks or contains a defect large enough to affect its structural integrity in the event of an Operating Basis Earthquake, a loss-of-coolant accident, or a steam line or feedwater line break as specified in 4.4.5.3.c, above.
8. Inspection determines the condition of the steam generator tube or sleeve from the point of entry (hot leg side) completely around the U-bend to the top support of the cold leg. For a tube in which the tube support plate elevation interim plugging limit has been applied, the inspection will include all the hot leg intersections and all cold leg intersections down to, at least, the level of the last crack indication.

SURVEILLANCE REQUIREMENTS

9. Sleeving a tube is permitted only in areas where the sleeve spans the tubesheet area and whose lower joint is at the primary fluid tubesheet face.
10. The Tube Support Plate Interim Plugging Criteria is used for disposition of a steam generator tube for continued service that is experiencing outer diameter initiated stress corrosion cracking confined within the thickness of the tube support plates. For application of the tube support plate interim plugging limit, the tube's disposition for continued service will be based upon standard bobbin probe signal amplitude. The plant-specific guidelines used for all inspections shall be amended as appropriate to accommodate the additional information needed to evaluate tube support plate signals with respect to the above voltage/depth parameters. Pending incorporation of the voltage verification requirements in ASME standard verifications, an ASME standard calibrated against the laboratory standard will be utilized in the Donald C. Cook Nuclear Plant Unit 1 steam generator inspections for consistent voltage normalization.
 1. A tube can remain in service if the signal amplitude of a crack indication is less than or equal to 2.0 volt, regardless of the depth of tube wall penetration, if, as a result, the projected end-of-cycle distribution of crack indications is verified to result in primary-to-secondary leakage less than 12.6 gpm (including sleeved tube leakage allowance as discussed in 4.4.5.4.a.13 below) in the faulted loop during a postulated steam line break event. The methodology for calculating expected leak rates from the projected crack distribution must be consistent with WCAP-13187, Rev. 0, and as prescribed in draft NUREG-1477.
 2. A tube should be plugged or repaired if the signal amplitude of the crack indication is greater than 2.0 volt except as noted in 4.4.5.4.a.10.3 below.
 3. A tube can remain in service with a bobbin coil signal amplitude greater than 2.0 volt but less than or equal to 3.6 volts if a rotating pancake probe inspection does not detect degradation. Indications of degradation with a bobbin coil signal amplitude greater than 3.6 volts will be plugged or repaired.
11. F* Distance is the distance from the bottom of the hardroll transition toward the bottom of the tubesheet that has been conservatively determined to be 1.11 inches (not including eddy current uncertainty).
12. F* Tube is a tube with degradation, below the F* distance, equal to or greater than 40%, and not degraded (i.e., no indications of cracking) within the F* distance.

SURVEILLANCE REQUIREMENTS

13. The HEJ Sleeved Tube Repair Boundary is used for disposition of parent tube wall degradation in HEJ sleeved tubes in or below the free span (upper) HEJ hardroll area. The dimensions specified below do not include eddy current uncertainty.
1. HEJ sleeved tubes with circumferential indications located from 1.1 inches to 1.3 inches (inclusive) below the bottom of the free span HEJ hardroll upper transition may remain in service provided the faulted loop SLB leakage limit of 12.6 gpm from all sources is not exceeded. A SLB leakage of 0.033 gpm shall be assumed for each indication, regardless of the actual indication length or depth.
 2. HEJ sleeved tubes with circumferential and/or axial indications whose upper most extent is located greater than 1.3 inches below the bottom of the free span HEJ hardroll upper transition may remain in service.
 3. HEJ sleeved tubes with axial indications whose upper most extent is located less than or equal to 1.3 inches below the bottom of the free span HEJ hardroll upper transition shall be plugged.

3/4 LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS
3/4.4 REACTOR COOLANT SYSTEM

SURVEILLANCE REQUIREMENTS

- b. The steam generator shall be determined OPERABLE after completing the corresponding actions (plugging or sleeving all tubes exceeding the repair limit and all tubes containing through-wall cracks) required by Table 4.4-2.
- c. Steam generator tube repairs may be made in accordance with the methods described in either WCAP-12623 or CEN-313-P.

4.4.5.5 Reports

- a. Following each inservice inspection of steam generator tubes, if there are any tubes requiring plugging or sleeving, the number of tubes plugged or sleeved in each steam generator shall be reported to the Commission within 15 days.
- b. The complete results of the steam generator tube inservice inspection shall be included in the Annual Operating Report for the period in which this inspection was completed. This report shall include:
 - 1. Number and extent of tubes inspected.
 - 2. Location and percent of wall-thickness penetration for each indication of an imperfection.
 - 3. Identification of tubes plugged or sleeved.
- c. Results of steam generator tube inspections which fall into Category C-3 and require prompt notification of the Commission shall be reported pursuant to Specification 6.9.1 prior to resumption of plant operation. The written followup of this report shall provide a description of investigations conducted to determine cause of the tube degradation and corrective measures taken to prevent recurrence.
- d. The results of inspections performed under 4.4.5.2 for all tubes in which the tube support plate interim plugging criteria has been applied or that have defects below the F* distance and were not plugged shall be reported to the Commission within 15 days following the inspection. The report shall include:
 - 1. Listing of applicable tubes.
 - 2. Location (applicable intersections per tube) and extent of degradation (voltage).
- e. The results of steam line break leakage analysis performed under T/S 4.4.5.4.a.10 and T/S 4.4.5.4.a.13 will be reported to the Commission prior to restart for Cycle 15.

3/4 BASES
3/4.4 REACTOR COOLANT SYSTEM

3/4.4.5 STEAM GENERATORS TUBE INTEGRITY (Continued)

Degraded steam generator tubes may be repaired by the installation of sleeves which span the section of degraded steam generator tubing. A steam generator tube with a sleeve installed meets the structural requirements of tubes which are not degraded.

To determine the basis for the sleeve plugging limit, the minimum sleeve wall thickness was calculated in accordance with Draft Regulatory Guide 1.121 (August 1976). In addition, a combined allowance of 20 percent of wall thickness is assumed for eddy current testing inaccuracies and continued operational degradation per Draft Regulatory Guide 1.121 (August 1976).

The repair boundary for parent tube degradation in the upper joint region of hybrid expansion joint (HEJ) sleeved tubes is outlined in WCAP-14446. The repair boundary maintains structural integrity consistent with Draft Regulatory Guide 1.121 (August 1976). Application of the repair boundary for indications in the hardroll lower transition provides allowance for leakage in the faulted loop during a postulated steam line break (SLB) event. A SLB leakage of 0.033 gpm is assumed for each applicable indication. SLB leakage from all sources must be calculated to be less than 12.6 gpm in the faulted loop. Maintenance of the 12.6 gpm limit ensures offsite doses will remain within 10% of the 10 CFR 100 guidelines for a SLB.

The following sleeve designs have been found acceptable by the NRC staff:

1. Westinghouse Mechanical Sleeves (WCAP-12623)
2. Combustion Engineering ~~Leak~~ Tight Sleeves (CEN-313-P)

Descriptions of other future sleeve designs shall be submitted to the NRC for review and approval in accordance with 10 CFR 50.90 prior to their use in the repair of degraded steam generator tubes. The submittals related to other sleeve designs shall be made at least 90 days prior to use.

REACTOR COOLANT SYSTEM

BASES

3/4.4.6 REACTOR COOLANT SYSTEM LEAKAGE

3/4.4.6.1 LEAKAGE DETECTION SYSTEMS

The RCS leakage detection systems required by this specification are provided to monitor and detect leakage from the Reactor Coolant Pressure Boundary. These detection systems are consistent with the recommendations of Regulatory Guide 1.45, "Reactor Coolant Pressure Boundary Leakage Detection Systems," May 1973.

3/4.4.6.2 OPERATIONAL LEAKAGE

Industry experience has shown that while a limited amount of leakage is expected from the RCS, the unidentified portion of this leakage can be reduced to a threshold value of less than 1 gpm. This threshold value is sufficiently low to ensure early detection of additional leakage.

The 10 GPM IDENTIFIED LEAKAGE limitations provides allowance for a limited amount of leakage from know sources whose presence will not interfere with the detection of UNIDENTIFIED LEAKAGE by the leakage detection systems.

3/4 BASES
3/4.4 REACTOR COOLANT SYSTEM

3/4.4.6.2 OPERATIONAL LEAKAGE (Continued)

The limitation on seal line resistance ensures that the seal line resistance is greater than or equal to the resistance assumed in the minimum safeguards LOCA analysis. This analysis assumes that all of the flow that is diverted from the boron injection line to the seal injection line is unavailable for core cooling.

Maintaining an operating leakage limit of 150 gpd per steam generator (600 gpd total) for Fuel Cycle 14 will minimize the potential for a large leakage event during steam line break under LOCA conditions. Based on the NDE uncertainties, bobbin coil voltage distribution and crack growth rate from the previous inspection, the expected leak rate following a steam line rupture is limited to below 12.6 gpm which will limit the calculated offsite doses to within 10 percent of the 10 CFR 100 guidelines. Leakage in the intact loops is limited to 150 gpd. If the projected end of cycle distribution of crack indications results in primary-to-secondary leakage greater than 12.6 gpm in the faulted loop during a postulated steam line break event, additional tubes must be removed from service in order to reduce the postulated primary-to-secondary steam line break leakage to below 12.6 gpm.

PRESSURE BOUNDARY LEAKAGE of any magnitude is unacceptable since it may be indicative of an impending gross failure of the pressure boundary. Should PRESSURE BOUNDARY LEAKAGE occur through a component which can be isolated from the balance of the Reactor Coolant System, plant operation may continue provided the leaking component is promptly isolated from the Reactor Coolant System since isolation removes the source of potential failure.

3/4.4.7 CHEMISTRY

The limitations on Reactor Coolant System chemistry ensure that corrosion of the Reactor Coolant System is minimized and reduces the potential for Reactor Coolant System leakage or failure due to stress corrosion. Maintaining the chemistry within the Steady State Limits provides adequate corrosion protection to ensure the structural integrity of the Reactor Coolant System over the life of the plant. The associated effects of exceeding the oxygen, chloride, and fluoride limits are time and temperature dependent. Corrosion studies show that operation may be continued with contaminant concentration levels in excess of the Steady State Limits, up to the Transient Limits, for the specified limited time intervals without having a significant effect on the structural integrity of the Reactor Coolant System. The time interval permitting continued operation within the restrictions of the Transient Limits provides time for taking corrective actions to restore the contaminant concentrations to within the Steady State Limits.

ATTACHMENT 5 TO AEP:NRC:1129E

WESTINGHOUSE ELECTRIC CORPORATION AUTHORIZATION LETTER,
CAW-95-786, APPLICATION FOR WITHHOLDING PROPRIETARY
INFORMATION FROM PUBLIC DISCLOSURE AND AFFIDAVIT

