

REACTOR COOLANT SYSTEM

SURVEILLANCE REQUIREMENTS (Continued)

1. All nonplugged tubes that previously had detectable wall penetrations (greater than 20%).
 2. Tubes in those areas where experience has indicated potential problems.
 3. A tube inspection (pursuant to Specification 4.4.5.4.a.8) 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.
 4. All Inservice Leak Limiting Alloy 800 sleeves shall be inspected over their full length during each refueling outage. These inspections will include both the tube and the sleeve.
- c. The tubes selected as the second and third samples (if required by Table 4.4-2) during each inservice inspection may be subjected to 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.
 2. The inspections include those portions of the tubes where imperfections were previously found.

The results of each sample inspection shall be classified into one of the following three categories:

<u>Category</u>	<u>Inspection Results</u>
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.

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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 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.
3. Degraded Tube means a tube containing imperfections greater than or equal to 20% of the nominal wall thickness caused by degradation.
4. % Degradation means the percentage of the tube wall thickness affected or removed by degradation.
5. Defect means an imperfection of such severity that it exceeds the plugging limit. A tube containing a defect is defective.
6. Plugging or Repair Limit means the condition at or beyond which the tube shall be removed from service by plugging or repaired by sleeving using the method in Specification 4.4.5.4.a.10 in the affected area. The plugging or repair limits are as follows:
 - i. In the non-sleeved portion of a tube, the plugging or repair limit imperfection depth is 40% of the nominal wall thickness. This Limit is not applicable in the portion of the tube that is greater than 10.3 inches below the bottom of the hot leg expansion transition or top of the tubesheet (whichever is lower) to the tube end. Degradation detected between 10.3 inches below the bottom of the hot leg expansion transition or top of the tubesheet (whichever is lower) and the bottom of the hot leg expansion transition or top of the tubesheet (whichever is higher) shall be plugged or repaired on detection.
 - ii. In the region of the tube sleeved using a Westinghouse Leak Limiting Alloy 800 sleeve, the tube shall be plugged upon detection of any service induced imperfection, degradation or defect in the (a) sleeve or (b) pressure boundary portion of the original tube wall in the sleeve/tube assembly (i.e., the sleeve-to-tube joint).
 - iii. All Leak Limiting Alloy 800 Sleeves that have a nickel band shall be plugged or removed from service after one cycle in operation.

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SURVEILLANCE REQUIREMENTS (Continued)

7. Unserviceable describes the condition of a tube 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 4.4.5.3c., above.
8. Tube Inspection for a tube with no portion of a sleeve extending below 10.3 inches from the bottom of the hot leg expansion transition or the top of the tubesheet (whichever is lower) means an inspection of the steam generator tube from 10.3 inches below the bottom of the hot leg expansion transition or top of the tubesheet (whichever is lower) completely around the U-bend to the top support of the cold leg. Tube Inspection for a tube with a portion of a sleeve extending below 10.3 inches from the bottom of the hot leg expansion transition or the top of the tubesheet (whichever is lower) means an inspection from the bottom of the sleeve completely around the U-bend to the top support of the cold leg.
9. Preservice Inspection means an inspection of the full length of each tube in each steam generator performed by eddy current techniques prior to service to establish a baseline condition of the tubing. This inspection shall be performed after the field hydrostatic test and prior to initial POWER OPERATION using the equipment and techniques expected to be used during subsequent inservice inspections.

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SURVEILLANCE REQUIREMENTS (Continued)

10. Tube Repair refers to sleeving with Westinghouse Leak Limiting Alloy 800 sleeves as described in WCAP-15918-P Revision 2, which are used to maintain a tube in service. Leak Limiting Alloy 800 Sleeves are applicable only to the original steam generators. The pressure boundary portion of the original tube wall in the sleeve/tube assembly (i.e., the sleeve-to-tube joint) shall be inspected prior to installation of each sleeve.

- b. The steam generator shall be determined OPERABLE after completing the corresponding actions (plug or repair all tubes exceeding the Plugging or Repair Limit and all tubes containing through-wall cracks) required by Table 4.4-2.

4.4.5.5 Reports

- a. Within 15 days following the completion of each inservice inspection of steam generator tubes, the number of tubes plugged or repaired in each steam generator shall be reported to the Commission in a Special Report pursuant to Specification 6.9.2.
- b. The complete results of the steam generator tube inservice inspection shall be submitted to the Commission in a Special Report pursuant to Specification 6.9.2 within 12 months following completion of the inspection. This Special Report shall include:
1. Number and extent of tubes and sleeves inspected.
 2. Location and percent of wall-thickness penetration for each indication of an imperfection.
 3. Identification of tubes plugged or repaired.
- c. Following each inspection and within 120 days after the reactor coolant system reenters MODE 4, the following information concerning indications found in the tubesheet region (including the expansion transition) shall be reported to the Commission in a special report pursuant to Specification 6.9.2. This Special Report shall include:
1. Number of total indications, location of each indication, orientation of each indication, severity of each indication, and whether the indications initiated from the inside or outside diameter.
 2. The cumulative number of indications detected in the tubesheet region as a function of elevation within the tubesheet.
 3. Projected end-of-cycle accident inducted leakage from tubesheet indications. This leakage shall be combined with the postulated end-of-cycle accident induced leakage from all other sources. If the preliminary estimated total projected end-of-cycle accident induced leakage from all sources exceeds the leakage limit, the NRC staff shall be notified prior to Unit restart.

**TABLE 4.4-2
STEAM GENERATOR TUBE INSPECTION**

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 S.G.	C-1	None	N/A	N/A	N/A	N/A
	C-2	Plug or repair defective tubes and inspect additional 2S tubes in this S.G.	C-1	None	N/A	N/A
			C-2	Plug or repair defective tubes and inspect additional 4S tubes in this S.G.	C-1	None
					C-2	Plug or repair defective tubes
			C-3	Perform action for C-3 result of first sample	N/A	N/A
C-3	Inspect all tubes in this S.G., plug or repair defective tubes and inspect 2S tubes in each other S.G.	All other S.G.s are C-1	None	N/A	N/A	
		Some S.G.s C-2 but no additional S.G. are C-3	Perform action for C-2 result of second sample.	N/A	N/A	
		Additional S.G. is C-3	Inspect all tubes in each S.G. and plug or repair defective tubes.	N/A	N/A	

$S = 3 \frac{N}{n} \%$ Where N is the number of steam generators in the unit, and n is the number of steam generators inspected during an inspection.