

I. Technical Specification Change Request No. 125

The Licensee requests that the attached changed pages replace the following pages of the existing Technical Specifications.

Appendix A

T.S. 4.19 pages 4-80, 81, 82, 85

II. Reasons for the Change Request

At the present time, Technical Specifications require in part successful completion of a periodic inservice inspection program of the steam generator tubes in order to confirm steam generator operability. T.S. 4.19 further indicates that where the inservice inspection program identifies tube defects, the tube in question will be removed from service by plugging.

The proposed change recognizes that for certain types of steam generator tube defects, other methods of repair may exist or may be developed to remove the defect from service. The change provides the flexibility to permit other repair methods to be used with the review and approval of the NRC Staff.

III. Safety Analysis Justifying Change

No new method of repair is proposed in this amendment. Any alternate repair methods proposed by the Licensee will require submission of a separate Safety Analysis for evaluation by the Staff. Thus, this change does not involve an increase in the probability or consequences of accidents previously evaluated, does not introduce accidents other than those previously evaluated, and does not reduce any safety margin.

IV. Amendment Classification (10CFR 170.22)

This change request is administrative in nature and has no safety or environmental significance and is therefore considered a Class II license amendment. A check in the amount of 1,200.00 will be forwarded under separate cover.

V. Implementation

It is requested that the NRC act on this request by June 15, 1983.

2. A seismic occurrence greater than the Operating Basis Earthquake.
3. A loss of coolant accident requiring actuation of the engineering safeguards, or
4. A major main steam line or feedwater line break.

4.19.4 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 drawing or specifications. Eddy current testing indications below 20% of the nominal tube wall thickness, if detectable, may be considered as imperfections.
 2. Degradation means 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 repair limit. A tube containing a defect is defective.
 6. Repair Limit means the imperfection depth at or beyond which the degraded tube or portion of a tube shall be repaired or removed from service because it may become unserviceable prior to the next inspection. This limit is equal to 40% of the nominal tube wall thickness, unless higher limits are shown to be acceptable by analysis and approved by the NRC.
 7. Unserviceable describes the condition of a tube if it leaks or contains a defect large enough to effect 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 4.19.3.c, above.
 8. Tube Inspection means an inspection of the steam generator tube from the bottom of the upper tubesheet completely to the top of the lower tubesheet, except as permitted by 4.19.2.b.2, above.

- b. The steam generator shall be determined OPERABLE after completing the corresponding actions (repair of all tubes exceeding the repair limit and all tubes containing throughwall cracks by plugging or by any other repair method shown to be acceptable by analysis or test, and approved by the NRC) required by Table 4.19.2.

4.19.5

Reports

- a. Following the completion of each inservice inspection of steam generator tubes, the number of tubes repaired in each steam generator shall be reported to the NRC within 15 days after completion of all repairs.
- b. The completed results of the steam generator tube inservice inspection shall be reported to the NRC within 3 months following completion of the inspection. 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 repaired and method of repair.
- c. Results of steam generator tube inspections which fall into Category C-3 and require prompt notification of the NRC shall be reported pursuant to Specification 6.9.2 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.

Bases

The Surveillance Requirements for inspection of the steam generator tubes insure that the structural integrity of this portion of the RCS will be maintained.

Table 4.19.2

STEAM GENERATOR TUBE INSPECTION (2)

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. (1)	C-1	None	N/A	N/A	N/A	N/A
	C-2	Repair defective tubes and inspect additional 2S tubes in this S.G.	C-1	None	N/A	N/A
			C-2	Repair defective tubes and inspect additional 4S tubes in this S.G.	C-1	None
					C-2	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 S.G., repair defective tubes and inspect 2S tubes in other S.G. Prompt notification to NRC pursuant to specification 6.9.2.	Other S.G. is C-1	None	N/A	N/A
			Other S.G. is C-2	Perform action for C-2 result of second sample	N/A	N/A
			Other S.G. is C-3	Inspect all tubes in each S.G. and repair defective tubes. Prompt notification to NRC pursuant to specification 6.9.2	N/A	N/A

NOTES: (1) $S = \frac{3N}{n} \%$ where N is the number of steam generator in the unit, and n is the number of steam generators inspected during an inspection.

(2) For tubes inspected pursuant to 4.19.2.a.4: No action is required for C-1 results. For C-2 results in one or both steam generators repair defective tubes. For C-3 results in one or both steam generators, repair defective tubes and provide prompt notification of NRC pursuant to specification 6.9.2.

The program for inservice inspection of steam generator tubes is based on a modification of Regulatory Guide 1.83, Revision 1. Inservice inspection of steam generator tubing is essential in order to maintain surveillance of the conditions of the tubes in the event that there is evidence of mechanical damage or progressive degradation due to design, manufacturing errors, or inservice conditions. Inservice inspection of steam generator tubing also provides a means of characterizing the nature and cause of any tube degradation so that corrective measures can be taken.

The Unit is expected to be operated in a manner such that the secondary coolant will be maintained within those chemistry limits found to result in negligible corrosion of the steam generator tubes. If the secondary coolant chemistry is not maintained within these chemistry limits, localized corrosion may likely result in stress corrosion cracking.

The extent of steam generator tube leakage due to cracking would be limited by the secondary coolant activity, Specification 3.1.6.3.

The extent of cracking during plant operation would be limited by the limitation of total steam generator tube leakage between the primary coolant system and the secondary coolant system (primary-to-secondary leakage = 1 gpm). Leakage in excess of this limit will require plant shutdown and an unscheduled inspection, during which the leaking tubes will be located and repaired by removal of the tube or degraded portion of the tube from service by plugging or a repair method shown to be acceptable by analysis or test, and approved by the NRC.

Wastage-type defects are unlikely with proper chemistry treatment of the secondary coolant. However, even if a defect would develop in service, it will be found during scheduled inservice steam generator tube examinations. Repair of the degraded tube or portion of tube will be required for degradation equal to or in excess of 40% of the tube nominal wall thickness, unless higher limits are shown to be acceptable by analysis and are reviewed and approved by the NRC. Repair will be accomplished by plugging or by a repair method shown to be acceptable by analysis or test, and approved by the NRC. Steam generator tube inspections of operating plants have demonstrated the capability to reliably detect degradation of this type that has penetrated 20% of the original tube wall thickness.

Where experience in similar plants with similar water chemistry, as documented by USNRC Bulletins/Circulars, indicate critical areas to be inspected, at least 50% of the tubes inspected should be from these critical areas. First sample inspections sample size may be modified subject to NRC review and approval.

GPUN EVALUATION OF SIGNIFICANT HAZARDS CONSIDERATIONS
(10CFR 50.91(a) and 10CFR 50.92)

An evaluation of significant hazards considerations related to this submittal can be separated into two parts, an evaluation of the Technical Specification change request, and an evaluation of the approval request for return of the repaired steam generators to service.

A. Technical Specification Change

The Technical Specification change is administrative in nature. As discussed in the safety evaluation for the change, the revised specification in itself would not permit any repair techniques except plugging to be used to return a steam generator to service after damage has been identified. It would, however, allow the Staff to authorize use of another repair technique after a separate evaluation, review and approval.

Because no changes are made in the conditions under which the steam generators may be operated, without NRC approval, it can be concluded that the change has not:

1. Increased the probability or consequences of an accident previously evaluated;
2. created the possibility of a new or different kind of accident from any accident previously evaluated;
3. involved a reduction in a margin of safety.

Thus, no significant hazards considerations are associated with the Technical Specification change itself.

B. Steam Generator Repair Approval

On December 10, 1982, we provided the Staff with Topical Report 008, Rev. 1, our safety evaluation for return of TMI-1 to service following repair of the steam generators. Revision 2 to this document was supplied to the Staff on March 31, 1983. A number of the reference documents to the topical report have also been made available.

The Topical Report covers the testing and analysis which shaped our conclusions, and the comprehensive precritical and postcritical test program planned to confirm them.

The completed testing and analysis, support the following conclusions:

1. We have sufficient understanding of the failure mechanism to assure safe operation and have taken steps to prevent its recurrence or reinitiation.
2. Our inspection techniques have been adequate to find and characterize relevant damage in these steam generators and the remainder of the reactor coolant system.
3. Our kinetic expansion repair technique is adequate to remove from service all significant defects about 8" above the lower face of the upper tubesheet. The repair creates a new tube-to-tubesheet joint below this point which meets the licensing basis of the original joint, and removes the degraded portions of tubing from the primary system pressure boundary.
4. The number and distribution of tubes plugged is such that the performance of the steam generator remain within the licensed basis during normal, transient, and accident conditions.
5. All tubing remaining in service has been examined and found to have no defects of a size which would propagate to failure due to normal operational vibration or loading, or to transient or accident loads.
6. Neither the performance of the kinetic expansion and plugging repairs, nor the operation of the repaired steam generators will have a detrimental effect on the remainder of the plant or on the environment.

These items have in turn led us to conclude that the repaired steam generator can once again be considered operable as part of the primary pressure boundary within the licensed basis.

Because the original licensing basis is not changed, it is concluded that operation using the repaired steam generators does not:

1. Increase the probability or consequences of an accident previously evaluated.
2. Create the possibility of a new or different kind of accident from any accident previously evaluated.
3. Involve a reduction in a margin of safety.

Thus, it is concluded that return of the steam generators to service following repair involves no significant hazards considerations.