ATTACHMENT A-1

Beaver Valley Power Station, Unit No. 1
Proposed Technical Specification Change No. 205
MARKED-UP REPLACEMENT PAGES

Revise the Technical Specification as follows:

Remove Pages	Insert Pages
3/4 4-8	3/4 4-8
3/4 4-9	3/4 4-9
3/4 4-10	3/4 4-10
3/4 4-10a	3/4 4-10a
3/4 4-10d	3/4 4-10d
B 3/4 4-2a	B 3/4 4-2a

DPR-66

REACTOR COOLANT SYSTEM

3/4.4.5 STEAM GENERATORS

LIMITING CONDITION FOR OPERATION

3.4.5 Each steam generator shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

With one or more steam generators inoperable, restore the inoperable generator(s) to OPERABLE status prior to increasing Tavg above 200°F.

SURVEILLANCE REQUIREMENTS

4.4.5.1 Steam Generator Sample Selection and Inspection - Each steam generator shall be determined OPERABLE during shutdown by selecting and inspecting at least the minimum number of steam generators specified in Table 4.4-1.

4.4.5.2 Steam Generator Tube Sample Selection and Inspection - The steam generator tube minimum sample size, inspection result classification, and the corresponding action required shall be as specified in Table 4.4-2. The inservice inspection of steam generator tubes shall be performed at the frequencies specified in Specification 4.4.5.3 and the inspected tubes shall be verified acceptable per the acceptance criteria of Specification 4.4.5.4. Steam generator tubes shall be examined in accordance with Article 8 of Section V ("Eddy current Examination of Tubular Products") and Appendix IV to Section XI ("Eddy Current Examination of Nonferromagnetic Steam Generator Heat Exchanger Tubing") of the applicable year and addenda of the ASME Boiler and Pressure Vessel Code required by 10CFR50, Section 50.55a(g). The tubes selected for each inservice inspection shall include at least 3% of the total number of tubes in all steam generators; the tubes selected for these inspections shall be selected on a random basis except:

INSERT A

a. 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 these critical areas.

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

1. All nonplugged tubes that previously had detectable wall penetrations (delete parenthesis >20% greater than), and

2. Tubes in those areas where experience has indicated potential problems, and

INSERT B →

Insert A

When applying the exceptions of 4.4.5.2.a through 4.4.5.2.c, previous defects or imperfections in the area repaired by sleeving are not considered an area requiring reinspection.

Insert B

3. At least 3% of the total number of sleeved tubes in all three steam generators. A sample size less than 3% is acceptable provided all the sleeved tubes in the steam generator(s) examined during the refueling outage are inspected. These inspections will include both the tube and the sleeve, and

4. A tube inspection pursuant to Specification 4.4.5.4.a.8. If any sleeved tube does not permit the passage of the eddy current probe for a tube or sleeve inspection, this shall be recorded and an adjacent tube shall be selected and subjected to a tube inspection.

Insert C

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 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.

SURVEILLANCE REQUIREMENTS (Continued)

c. ~~The second and third inservice inspections may be less than a full tube inspection by concentrating (selecting at least 50% of the tubes to be inspected) the inspection on those areas of the tube sheet array and on those portions of the tubes where tubes with imperfections were previously found.~~

INSERT C →

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

Category	Inspection Results
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 or sleeves must exhibit significant (greater than 10%) further wall penetrations to be included in the above percentage calculations.

4.4.5.3 Inspection Frequencies - The above required inservice inspections of steam generator tubes shall be performed at the following frequencies:

a. 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 following service under AVT conditions, 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.

SURVEILLANCE REQUIREMENTS (Continued)

b. If the inservice inspection of a steam generator conducted in accordance with Table 4.4-2 requires a third sample inspection whose results fall in Category C-3, the inspection frequency shall be reduced to at least once per 20 months. The reduction in inspection frequency shall apply until a subsequent inspection demonstrates that a third sample inspection is not required.

c. Additional, unscheduled inservice inspections shall be performed on each steam generator in accordance with the first sample inspection specified in Table 4.4-2 during the shutdown subsequent to any of the following conditions:

1. Primary-to-secondary tube leaks (not including leaks originating from tube-to-tube sheet welds) in excess of the limits of Specification 3.4.6.2,

2. A seismic occurrence greater than the Operating Basis Earthquake,

3. A loss-of-coolant accident requiring actuation of the engineered safeguards, or

4. A main steam line or feedwater line break.

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 means a tube or sleeve containing imperfections ≥ 20% of the nominal wall thickness caused by degradation.

4. % Degradation means the percentage of the tube or sleeve wall thickness affected or removed by degradation.

greater than or equal to

SURVEILLANCE REQUIREMENTS (Continued) or repair

5. Defect means an imperfection of such severity that it exceeds the plugging limit. A tube containing a defect is defective. Any tube which does not permit the passage of the eddy-current inspection probe shall be deemed a defective tube.

6. ~~Plugging Limit means the imperfection depth at or beyond which the tube shall be removed from service because it may become unserviceable prior to the next inspection and is equal to 40% of the nominal tube wall thickness.~~ INSERT D

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 E[illegible]hquake, a loss-of-coolant accident, or a ste[illegible] or feedwater line break as specified in 4.[illegible]ve.

8. Ty[illegible]n means an inspection of the steam g[illegible] from the point of entry (hot leg side) [illegible]nd the U-bend to the top support to the

INSERT E

[illegible] shall be determined OPERABLE after [illegible]rresponding actions (plug all tubes exce[illegible]ging limit) ~~and all tubes containing throu[illegible]~~ required by Table 4.4-2. or repair

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 in each steam generator shall be reported to the Commission in a Special Report pursuant to Specification 6.9.2. or repaired

b. The complete results of the steam generator tube and sleeve inservice inspection shall be submitted to the Commission in a Special Report pursuant to Specification 6.9.2 within 12 months following the 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.

Insert D

6. Plugging or Repair Limit means the imperfection depth at or beyond which the tube shall be removed from service by plugging or repaired by sleeving in the affected area because it may become unserviceable prior to the next inspection. The plugging or repair limit imperfection depths are specified in percentage of nominal wall thickness as follows:

a.	Original tube wall	40%
b.	Babcock & Wilcox kinetic welded sleeve wall	40%
c.	Westinghouse laser welded sleeve wall	31%

Insert E

9. Tube Repair refers to sleeving which is used to maintain a tube in-service or return a tube to service. This includes the removal of plugs that were installed as a corrective or preventive measure. The following sleeve designs have been found acceptable:

a) Babcock & Wilcox kinetic welded sleeves, BAW-2094P, Revision 1 including kinetic sleeve "tooling" and installation process parameter changes.

b) Westinghouse laser welded sleeves, WCAP-13483, Revision 1.

TABLE 4.4-1

MINIMUM NUMBER OF STEAM GENERATORS TO BE

INSPECTED DURING INSERVICE INSPECTION

DPR-66

Preservice Inspection	No			Yes		
No. of Steam Generators per Unit	Two	Three	Four	Two	Three	Four
First Inservice Inspection	All			One	Two	Two
Second & Subsequent Inservice Inspections	One[1]			One[1]	One[2]	One[3]

Table Notation:

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

2. The other steam generator not inspected during the first inservice inspection shall be inspected. The third and subsequent inspections should follow the instructions described in 1 above.

3. Each of the other two steam generators not inspected during the first inservice inspections shall be inspected during the second and third inspections. The fourth and subsequent inspections shall follow the instructions described in 1 above.

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 defective tubes and inspect additional 2S tubes in this S. G. or repair	C-1	None	N/A	N/A
			C-2	Plug defective tubes and inspect additional 4S tubes in this S. G. or repair	C-1	None
					C-2	Plug 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., plug defective tubes and inspect 2S tubes in each other S. G. Notification to NRC pursuant to Specification 6.6.	All other S.G.s are C-1	None	N/A	N/A
			Some S.G.s C-2 but no additional S.G.s are C-3	Perform action for C-2 result of second sample or repair	N/A	N/A
			Additional S.G. is C-3	Inspect all tubes in each S.G. and plug defective tubes. Notification to NRC pursuant to Specification 6.6.	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.

DPR-66

3/4.4.5 STEAM GENERATORS (Continued)

The Surveillance Requirements for inspection of the steam generator tubes ensure that the structural integrity of this portion of the RCS will be maintained. 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 that lead to corrosion. 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 plant is expected to be operated in a manner such that the secondary coolant will be maintained within those parameter limits found to result in negligible corrosion of the steam generator tubes. If the secondary coolant chemistry is not maintained within these parameter limits, localized corrosion may likely result in stress corrosion cracking. The extent of cracking during plant operation would be limited by the limitation of steam generator tube leakage between the primary coolant system and the secondary coolant system (primary-to-secondary leakage = 500 gallons per day per steam generator). Cracks having a primary-to-secondary leakage less than this limit during operation will have an adequate margin of safety to withstand the loads imposed during normal operation and by postulated accidents. Operating plants have demonstrated that primary-to- secondary leakage of 500 gallons per day per steam generator can readily be detected by radiation monitors of steam generator blowdown. Leakage in excess of this limit will require plant shutdown and an unscheduled inspection, during which the leaking tubes will be located and plugged.

Wastage-type defects are unlikely with the all volatile treatment (AVT) of secondary coolant. However, even if a defect of similar type should develop in service, it will be found during scheduled inservice steam generator tube examinations. Plugging or repair will be required of all tubes with imperfections exceeding the plugging limit. ~~which, by the definition of Specification 4.4.5.4.a is 40% of the tube nominal wall thickness.~~ Steam generator tube inspections of operating plants have demonstrated the capability to reliably detect degradation that has penetrated 20% of the original tube wall thickness.

INSERT F

Whenever the results of any steam generator tubing inservice inspection fall into Category C-3, these results will be reported to the Commission pursuant to Specification 6.6 prior to resumption of plant operation. Such cases will be considered by the Commission on a case-by-case basis and may result in a requirement for analysis, laboratory examinations, tests, additional eddy-current inspection, and revision of the Technical Specifications, if necessary.

Insert F

Degraded steam generator tubes may be repaired by the installation of sleeves which span the degraded tube section. A steam generator tube with a sleeve installed meets the structural requirements of tubes which are not degraded, therefore, the sleeve is considered a part of the tube. The surveillance requirements identify those sleeving methodologies approved for use. If an installed sleeve is found to have through wall penetration greater than or equal to the plugging limit, the tube must be plugged. The plugging limit for the sleeve is derived from R.G. 1.121 analysis which utilizes a 20% allowance for eddy current uncertainty in determining the depth of tube wall penetration and additional degradation growth.

ATTACHMENT A-2

Beaver Valley Power Station, Unit No. 2
Proposed Technical Specification Change No. 71
MARKED-UP REPLACEMENT PAGES

Revise the Technical Specification as follows:

Remove Pages	Insert Pages
3/4 4-11	3/4 4-11
3/4 4-12	3/4 4-12
3/4 4-13	3/4 4-13
3/4 4-14	3/4 4-14
3/4 4-16	3/4 4-16
B 3/4 4-3	B 3/4 4-3

REACTOR COOLANT SYSTEM

3/4.4.5 STEAM GENERATORS

LIMITING CONDITION FOR OPERATION

3.4.5 Each steam generator shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4

ACTION:

With one or more steam generators inoperable, restore the inoperable generator(s) to OPERABLE status prior to increasing T_{avg} above 200°F.

SURVEILLANCE REQUIREMENTS

4.4.5.1 Steam Generator Sample Selection and Inspection - Each steam generator shall be determined OPERABLE during shutdown by selecting and inspecting at least the minimum number of steam generators specified in Table 4.4-1.

4.4.5.2 Steam Generator Tube Sample Selection and Inspection - The steam generator tube minimum sample size, inspection result classification, and the corresponding action required shall be as specified in Table 4.4-2. The in-service inspection of steam generator tubes shall be performed at the frequencies specified in Specification 4.4.5.3 and the inspected tubes shall be verified acceptable per the acceptance criteria of Specification 4.4.5.4. Steam generator tubes shall be examined in accordance with Article 8 of Section V ("Eddy Current Examination of Tubular Products") and Appendix IV to Section XI ("Eddy Current Examination of Nonferromagnetic Steam Generator Heat Exchanger Tubing") of the applicable year and addenda of the ASME Boiler and Pressure Vessel Code required by 10 CFR 50, Section 50.55a(g). The tubes selected for each inservice inspection shall include at least 3% of the total number of tubes in all steam generators; the tubes selected for these inspections shall be selected on a random basis except:

INSERT A

a. 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 these critical areas;

sample of tubes selected for each

b. The first inservice inspection (subsequent to the preservice inspection) of each steam generator shall include:

delete parenthesis

1. All nonplugged tubes that previously had detectable wall penetrations (> than 20%), and

greater

2. Tubes in those areas where experience has indicated potential problems, and

INSERT B →

Insert A

When applying the exceptions of 4.4.5.2.a through 4.4.5.2.c, previous defects or imperfections in the area repaired by sleeving are not considered an area requiring reinspection.

Insert B

3. At least 3% of the total number of sleeved tubes in all three steam generators. A sample size less than 3% is acceptable provided all the sleeved tubes in the steam generator(s) examined during the refueling outage are inspected. These inspections will include both the tube and the sleeve, and

4. A tube inspection pursuant to Specification 4.4.5.4.a.8. If any selected tube does not permit the passage of the eddy current probe for a tube or sleeve inspection, this shall be recorded and an adjacent tube shall be selected and subjected to a tube inspection.

Insert C

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 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.

REACTOR COOLANT SYSTEM

SURVEILLANCE REQUIREMENTS (Continued)

c. ~~The second and third inservice inspections may be less than a full tube inspection by concentrating (selecting at least 50% of the tubes to be inspected) the inspection on those areas of the tube sheet array and on those portions of the tubes where tubes with imperfections were previously found.~~

INSERT C →

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

Category	Inspection Results
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 percent of the total tubes inspected are defective, or between 5 percent and 10 percent of the total tubes inspected are degraded tubes.
C-3	More than 10 percent of the total tubes inspected are degraded tubes or more than 1 percent of the inspected tubes are defective.

greater than

or sleeves

Note: In all inspections, previously degraded tubes must exhibit significant (>10 percent) further wall penetrations to be included in the above percentage calculations.

4.4.5.3 Inspection Frequencies - The above required inservice inspections of steam generator tubes shall be performed at the following frequencies.

a. 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 following service under All Volatile Treatment (AVT) conditions, 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.

b. If the inservice inspection of a steam generator conducted in accordance with Table 4.4-2 requires a third sample inspection whose results fall in Category C-3, the inspection frequency shall be increased at least once per 20 months. The increase in the inspection frequency shall apply until a subsequent inspection demonstrates that a third sample inspection is not required.

REACTOR COOLANT SYSTEM

SURVEILLANCE REQUIREMENTS (Continued)

c. Additional, unscheduled inservice inspections shall be performed on each steam generator in accordance with the first sample inspection specified in Table 4.4-2 during the shutdown subsequent to any of the following conditions:

1. Primary-to-secondary tube leaks (not including leaks originating from tube-to-tube sheet welds) in excess of the limits of Specification 3.4.6.2,

2. A seismic occurrence greater than the Operating Basis Earthquake,

3. A loss-of-coolant accident requiring actuation of the engineered safeguards, or

4. A main steam line or feedwater line break.

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 means a tube or sleeve containing imperfections greater than or equal to 20 percent of the nominal wall thickness caused by degradation.

4. % Degradation means the percentage of the tube or sleeve wall thickness affected or removed by degradation.

5. Defect means an imperfection of such severity that it exceeds the plugging or repair limit. A tube containing a defect is defective. Any tube which does not permit the passage of the eddy-current inspection probe shall be deemed a defective tube.

6. ~~Plugging Limit means the imperfection depth at or beyond which the tube shall be removed from service because it may become unserviceable prior to the next inspection and is equal to 40 percent of the nominal tube wall thickness.~~ INSERT D

PROPOSED

Insert D

6. Plugging or Repair Limit means the imperfection depth at or beyond which the tube shall be removed from service by plugging or repaired by sleeving in the affected area because it may become unserviceable prior to the next inspection. The plugging or repair limit imperfection depths are specified in percentage of nominal wall thickness as follows:

a.	Original tube wall	40%
b.	Babcock & Wilcox kinetic welded sleeve wall	40%
c.	Westinghouse laser welded sleeve wall	31%

Insert E

9. Tube Repair refers to sleeving which is used to maintain a tube in-service or return a tube to service. This includes the removal of plugs that were installed as a corrective or preventive measure. The following sleeve designs have been found acceptable:

a) Babcock & Wilcox kinetic welded sleeves, BAW-2094P, Revision 1 including kinetic sleeve "tooling" and installation process parameter changes.

b) Westinghouse laser welded sleeves, WCAP-13483, Revision 1.

REACTOR COOLANT SYSTEM

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 4.4.5.3.c, above.

8. Tube Inspection means an inspection of the steam generator tube from the point of entry (hot leg side) completely around the U-bend to the top support of the cold leg.

INSERT E →

b. The steam generator shall be determined OPERABLE after completing the corresponding actions (plug all tubes exceeding the plugging limit ~~and all tubes containing through-wall cracks~~) or repair 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 and sleeve inservice inspection shall be included in a Special Report pursuant to Specification 6.9.2 within 12 months following the completion of the inspection. This report shall include:

1. Number and extent of tubes or sleeves inspected.

2. Location and percent of wall-thickness penetration for each indication of an imperfection.

3. Identification of tubes plugged or repaired.

c. Results of steam generator tube inspections which fall into Category C-3 shall be reported to the Commission pursuant to Specification 6.6 prior to resumption of plant operation. The written report shall provide a description of investigations conducted to determine cause of the tube degradation and corrective measures taken to prevent recurrence.

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 defective Tubes and inspect additional 2S tubes in this S.G. or repair	C-1	None	N/A	N/A
			C-2	Plug defective tubes and inspect additional 4S tubes in this S.G. or repair	C-1	None
					C-2	Plug 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., plug defective tubes and inspect 2S tubes in each other S.G. Notification to NRC pursuant to §50.72 (b)(2) of 10 CFR Part 50	All other S.G.'s are C-1	None	N/A	N/A
			Some S.G.'s C-2 but no add'l S.G. are C-3	Perform action for C-2 result of second sample or repair	N/A	N/A
			Add'l S.G. is C-3	Inspect all tubes in each S.G. and plug defective tubes. Notification to NRC pursuant to §50.72 (b)(2) of 10 CFR Part 50	N/A	N/A

$S = \frac{9}{n} I$ Where n is the number of steam generators inspected during an inspection.

3/4.4.5 STEAM GENERATORS (Continued)

decay heat removal capabilities for RCS temperatures greater than 350°F if one steam generator becomes inoperable due to single failure considerations. Below 350°F, decay heat is removed by the RHR system.

The Surveillance Requirements for inspection of the steam generator tubes ensure that the structural integrity of this portion of the RCS will be maintained. 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 that lead to corrosion. 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 plant is expected to be operated in a manner such that the secondary coolant will be maintained within those parameter limits found to result in negligible corrosion of the steam generator tubes. If the secondary coolant chemistry is not maintained within these parameter limits, localized corrosion may likely result in stress corrosion cracking. The extent of cracking during plant operation would be limited by the limitation of steam generator tube leakage between the primary coolant system and the secondary coolant system (primary-to-secondary leakage = 500 gallons per day per steam generator). Cracks having a primary-to-secondary leakage less than this limit during operation will have an adequate margin of safety to withstand the loads imposed during normal operation and by postulated accidents. Operating plants have demonstrated that primary-to-secondary leakage of 500 gallons per day per steam generator can readily be detected by radiation monitors of steam generator blowdown. Leakage in excess of this limit will require plant shutdown and an unscheduled inspection, during which the leaking tubes will be located and plugged.

of repair

Wastage-type defects are unlikely with the all volatile treatment (AVT) of secondary coolant. However, even if a defect of similar type should develop in service, it will be found during scheduled inservice steam generator tube examinations. Plugging will be required of all tubes with imperfections exceeding the plugging limit, ~~which, by the definition of Specification 4.4.5.4.a is 40% of the tube nominal wall thickness.~~ Steam generator tube inspections of operating plants have demonstrated the capability to reliably detect degradation that has penetrated 20% of the original tube wall thickness.

of repair

INSERT F

Whenever the results of any steam generator tubing inservice inspection fall into Category C-3, these results will be reported to the Commission pursuant to Specification 6.6 prior to resumption of plant operation. Such cases will be considered by the Commission on a case-by-case basis and may result in a requirement for analysis, laboratory examinations, test, additional eddy-current inspection, and revision of the Technical Specifications, if necessary.

Insert F

Degraded steam generator tubes may be repaired by the installation of sleeves which span the degraded tube section. A steam generator tube with a sleeve installed meets the structural requirements of tubes which are not degraded, therefore, the sleeve is considered a part of the tube. The surveillance requirements identify those sleeving methodologies approved for use. If an installed sleeve is found to have through wall penetration greater than or equal to the plugging limit, the tube must be plugged. The plugging limit for the sleeve is derived from R.G. 1.121 analysis which utilizes a 20% allowance for eddy current uncertainty in determining the depth of tube wall penetration and additional degradation growth.

ATTACHMENT B

Beaver Valley Power Station, Unit Nos. 1 and 2
Proposed Technical Specification Change No. 205/71
REVISION OF SPECIFICATION 3.4.5

A. DESCRIPTION OF AMENDMENT REQUEST

The proposed amendment would modify the surveillance requirements of Specification 3.4.5, "Steam Generators" and Bases 3/4.4.5 to allow sleeving at the tube support plate and tubesheet regions in accordance with the processes performed by the vendors Babcock and Wilcox (B&W) and Westinghouse. The following proposed changes revise the surveillance requirements and bases to identify sleeving as a repair method for defective tubes:

Surveillance Requirement (SR) 4.4.5.2 has been revised by including an exception to the degraded tube inspection requirements for tubes that have been repaired by sleeving.

SR 4.4.5.2.b has been revised to incorporate the Standard Technical Specification (STS) words including the addition of Items 3 and 4. Items 1 and 2 include editiorial changes, Item 3 specifies the required population of sleeved tubes to be inspected and Item 4 provides alternate inspection requirements when a tube or sleeve does not permit passage of an eddy current inspection probe.

SR 4.4.5.2.c has been revised to incorporate the STS words and provides the criteria for partial tube inspection during the second and third inservice inspections. The note has been revised to address sleeves.

SR 4.4.5.3.c includes editorial changes.

SR 4.4.5.4.a, Items 1, 2, 3 and 4 have been revised to include sleeves in the steam generator acceptance criteria definitions.

SR 4.4.5.4.a, Item 5 has been revised to include tube repair in the definition of defect. Item 6 has been changed to include the sleeve imperfection plugging limits. Item 9 has been added to define "tube repair" and specify the approved sleeving vendors.

SR 4.4.5.4.b has been revised by including tube repair when steam generator operability is determined.

SR 4.4.5.5.a and 4.4.5.5.b have been revised by including tube repair by sleeving in steam generator tube inspection reports.

BV-1 Table 4.4-1 includes a revised page number.

Table 4.4-2 has been revised to include tube repair in the actions required for categories C-2 and C-3. The BV-1 page number has also been revised.

Bases 4/4.4.5, Steam Generators, has been revised by including the basis for repair of degraded steam generator tubes by sleeving.

B. BACKGROUND

Pressurized water reactor steam generators have experienced tube degradation related to corrosion phenomena such as wastage, pitting, intergranular attack, stress corrosion cracking and crevice corrosion along with other phenomena such as denting and vibration wear. Tubes that experience excessive degradation reduce the integrity of the primary-to-secondary pressure boundary. These tubes are considered defective and must be repaired or plugged and removed from service. The installation of steam generator tube plugs removes the heat transfer surface of the plugged tube from service and leads to a reduction in the primary coolant flow available for core cooling. Sleeving is a steam generator tube repair method which secures a length of tubing (sleeve) having an outer diameter slightly smaller than the inside of the steam generator tube and also spans the degraded region of the parent tube. Installation of steam generator sleeves does not greatly affect the heat transfer capability or the primary coolant flow rate through the tube being sleeved, therefore, a large number of sleeves can be installed without significantly affecting the operation of the RCS. The sleeve spans the degraded section of the tube and maintains the structural integrity of the steam generator tube under normal and accident conditions and limits or prevents leakage if a through hole in the tube wall should develop.

C. JUSTIFICATION

The purpose of sleeving is to repair a degraded tube in a manner that maintains the function and integrity of the tube. Surveillance Requirement 4.4.5.4 states that a steam generator tube containing a defect is defective. A defect is defined as an imperfection of such severity that it exceeds the plugging limit, equal to 40 percent of the nominal tube wall thickness. All tubes exceeding the plugging limit are taken out of service by plugging. Repairs by means other than plugging are not currently addressed in the technical specifications. Tube sleeving provides an advantage to plugging in that the tube will remain in service with the structural integrity of the tube maintained with only a small reduction in flow and heat transfer capability. The repaired tube functions in a manner similar to the original tube. The sleeves will be installed in accordance with the processes provided by the vendors and described in the associated reports which address sleeve design, qualification, installation methods, non-destructive examination and ALARA considerations. The B&W sleeving process is described in NRC approved topical report BAW-2094P, Revision 1. The Westinghouse process is described in attached WCAP-13483, Revision 1, "Beaver Valley Units 1 and 2, Westinghouse Series 51 Steam Generator Sleeving Report Laser Welded Sleeves" and is provided for NRC review and approval.

D. SAFETY ANALYSIS

The tube sleeving procedure involves inserting a tube of smaller diameter (the sleeve) inside the tube to be repaired. Sleeves span a defective or degraded region of a tube and are mechanically joined to the parent tube by a roll expansion and weld at the tubes' end areas, thereby maintaining the steam generator tubing primary-to-secondary pressure boundary under normal and accident conditions. Thus, sleeving leaves the repaired tube functional. This is in contrast to plugging, which removes the heat transfer surface of the plugged tube from service and reduces the reactor coolant system (RCS) flow available for reactor core cooling. Therefore, a large number of sleeves can be installed without significantly affecting either RCS flow rate or plant operating efficiency (as compared to plugging), and the service life of a steam generator that is experiencing degradation can be extended.

The principal accident associated with this proposed change is the steam generator tube rupture accident. The environmental effects associated with a steam generator tube rupture are discussed in BV-1 UFSAR Section 14.2.4 and BV-2 UFSAR Section 15.6.3, Steam Generator Tube Rupture. For this occurrence, fission products contained in the RCS would be released to the secondary system. Some of the radioactive noble gases and iodine would be released into the atmosphere through the condenser air removal system and steam line safety valves. Use of the tube sleeving process will allow the repair of degraded steam generator tubes such that the function and integrity of the tube is maintained, therefore, the steam generator tube rupture accident is not affected by sleeving.

The tube sleeve is specifically designed to repair steam generator tubes which are exhibiting degradation in the tube sheet or at the tube support plate. The material selected for the sleeve is thermally treated Alloy 690 Inconel due to its enhanced corrosion resistance properties. The structural analysis of the sleeve demonstrates that its design meets the ASME Boiler and Pressure Vessel Code (ASME Code) Section III criteria for the steam generator pressure, temperature, and flow design conditions and establishes the minimum reactor coolant pressure boundary wall thickness requirements. Vibration testing and analysis were performed to demonstrate the adequacy of the sleeved tube for a 40 year design life objective. Fatigue loadings used during the qualification testing of the sleeve joints were established in accordance with ASME Code requirements to verify the integrity of the sleeve over the design life of the plant. Fatigue testing consisted of axial load cycling, vibration cycling, pressure cycling and thermal cycling. The sleeve is designed to accommodate all fatigue that the tubes may experience due to normal plant conditions and all anticipated transients.

The tubesheet and free span joints are mechanical seals produced by roll expanding the sleeve into the tube. The structural integrity of the joints was proven by subjecting sleeve/tube specimens to a series of tests representing steam generator service conditions. These samples were fatigue tested, tensile tested, thermal cycled, and leak tested to qualify the joints by experimental stress analysis in accordance with ASME Section III. Corrosion testing has demonstrated the corrosion resistance of the sleeve and the sleeve/tube joints.

Defects which have been spanned by a sleeve need not be considered for determination of inspection result categories in accordance with surveillance requirement 4.4.5.2, Steam Generator Tube Sample Selection and Inspection. For the case in which the degraded tube has been spanned by a sleeve, further tube wall penetrations in the parent tube (from the bottom of the uppermost rolled joint to the top of the lower-most rolled joint) are considered inconsequential since that portion of the tube no longer constitutes the reactor coolant pressure boundary. Any degradation in the parent tube in the area spanned by the sleeve does not affect the integrity of the pressure boundary and therefore, does not require the same degree of scrutiny as a wall penetration greater than 20 percent in a portion of the tube that does constitute the pressure boundary. The inspection requirement still applies to a sleeved tube which has been subjected to a random full length examination and has been found to have a wall penetration greater than 20 percent in either the portion of the tube which is not spanned by the sleeve or in the sleeve itself.

B&W Kinetic Welded Sleeve Process

NRC approved Topical Report BAW-2094P, Revision 1 describes in detail the analytical methods used for the design and qualification of the B&W tube sleeve. The topical report also contains the results of the sleeve design verification which included analysis and confirmatory testing to demonstrate the acceptability of the steam generator sleeving technique. The design and operating conditions (including transient conditions and cycles) specified for the sleeve in the topical report bound the steam generator design conditions.

The technical specifications do not specifically limit the number of steam generator tubes which can be plugged while retaining acceptable primary flow rates. As discussed in the topical report the thermal hydraulic effect of installing up to 2,000 sleeves in each steam generator has been analyzed. Two cases were considered, a 2 inch tube roll in the tubesheet with 29 inch sleeves and a full tube roll in the tubesheet with 11 inch sleeves. The 2,000 sleeves consisted of 1,000 tubesheet sleeves and 1,000 tube support plate sleeves evenly distributed throughout the steam generator. Sleeving 2,000 tubes in each steam generator will reduce RCS flow up to 0.63 percent and heat transfer performance up to 0.91 percent.

An analysis has been performed in accordance with Regulatory Guide 1.121, Bases for Plugging Degraded PWR Steam Generator Tubes, to establish the sleeve defect plugging criterion. The plugging limit for the sleeve is calculated to be a 60 percent through wall defect. An additional 20 percent of the wall thickness is deducted as a combined allowance for postulated degradation due to corrosion and for eddy current testing inaccuracy. Therefore, a defect plugging limit of 40 percent of the original sleeve wall is established.

A baseline eddy current (ECT) inspection of the installed sleeves is performed prior to operation. ECT is used to detect the presence of defects in the steam generator tubes and sleeves. ECT detects the presence of defect caused variations in the effective electrical conductivity and/or magnetic permeability of the tubes. The required defect sizes can be detected and sized in the sleeve, the parent tube behind the sleeve, and the tube above the sleeve.

The B&W sleeving methodology described in topical report BAW-2094P, Revision 1 was accepted by the NRC for referencing in licensing applications on January 4, 1990. The sleeve installation procedures described in BAW-2094P, Revision 1 will be revised to include the kinetic sleeve "tooling" and installation process parameter changes described in NRC approved BAW-2045PA, Revision 1, January 1992, "Recirculating Steam Generators Kinetic Qualification for 3/4 Inch OD Tubes." These changes were incorporated to resolve field problems or to improve the sleeve installation rate and will not alter the basic installed configuration of the sleeve as described in BAW-2094P, Revision 1. We have reviewed the methodology described in BAW 2094P, Revision 1 and determined that they are applicable to the Beaver Valley units and provide a safe and efficient alternative to plugging.

Westinghouse Laser Welded Sleeve Process

Section III of the ASME Code was used, during the development of laser welded sleeving, for the minimum wall thickness determination and bounding stress and fatigue levels for the sleeve. By showing that the sleeve design meets all facets of the applicable subsections of Section III of the Code, the sleeve design meets the design requirements of the original tubing. Regulatory Guide 1.121 is used to develop the plugging limit of the sleeve should sleeve wall degradation occur. WCAP-13483, Revision 1, describes in detail the analytical methods used for the design and qualification of the Westinghouse tube sleeve. The WCAP also contains the results of the sleeve design verification which included analysis and confirmatory testing to demonstrate the acceptability of the steam generator sleeving technique. Potentially degraded sleeves were shown (by analysis) to retain burst strength in excess of three times the normal operating pressure differential for the Beaver Valley units. The requirements of Regulatory Guide 1.83, "Inservice Inspection of

PWR Steam Generator Tubes" are implemented, and a baseline eddy current inspection of the installed sleeves is performed prior to operation. An ultrasonic inspection of a sample of the free span weld joints is also performed prior to operation. The ultrasonic inspection is used to verify that the minimum acceptable fusion zone thickness of the weld is achieved. This minimum weld fusion zone thickness has been shown by analysis to satisfy the requirements of the ASME Code with regard to acceptable stress during operating and accident conditions.

The standard eddy current inspection procedure involves the use of a bobbin eddy current probe, with two circumferentially wound coils which are displaced axially along the probe body. The coils are connected in the differential mode where the system responds only when there is a difference in the properties of the material surrounding the two coils. The coils are excited by using an eddy current instrument that displays changes in the material surrounding the coils by measuring the electrical impedance of the coils. The outputs of the various frequencies are combined and recorded. The combined data yields an output in which signals resulting from conditions that do not affect the integrity of the tube are reduced. By reducing unwanted signals, improved inspectability of the tubing results. Regions in the steam generator such as the tube support plate, tubesheet weld area and sleeve transition zones are examples of areas where multifrequency processing has proven valuable in providing improved inspectability. After sleeve installation, all sleeved tubes are subjected to an eddy current inspection which includes a verification of correct sleeve installation for process control, degradation inspection and establishing a baseline for all subsequent inspection comparisons.

Leakage testing under conditions considered to be more severe than expected during all operating plant conditions has shown that the laser welded sleeve does not introduce additional primary to secondary leakage during a postulated steam line break event. Leakage testing has also shown that the seal weld of the lower joint in the tubesheet sleeve is not required in order to preclude leakage during normal operation or accident conditions. Sleeve/tube leakage test specimens were subjected to both fatigue and thermal cycling tests prior to final leak rate evaluation testing. The load level applied during the fatigue testing exceeded the maximum axial load applied to the sleeve during the most severe pressure loading condition. Thermal cycling tests simulated a standard plant heatup/cooldown cycle.

Westinghouse has evaluated the laser welded sleeving process in WCAP-13483, Revision 1. A copy of the WCAP is provided in Attachment D for NRC review and acceptance. We have reviewed the methodology described in the WCAP and determined that it provides a safe and efficient alternative to plugging.

Conclusion

Based on the Regulatory Guide 1.121 guidelines for tube degradation limits, appropriate plugging limits have been established. Eddy current techniques are available to perform necessary sleeve and tube inspections for defect detection and to verify proper installation of the sleeve. Available techniques are capable of providing adequate defect sensitivity in the required areas of the tube and sleeve pressure boundary. Proprietary methods described in the vendor reports with supporting qualification data demonstrate the inspectability of the sleeve and underlying tube. In addition, we are committing to qualify the adequacy of any system that is used for periodic inservice inspection and to evaluate and, if practical, implement better testing methods as they are developed and qualified for use.

E. NO SIGNIFICANT HAZARDS EVALUATION

The no significant hazard considerations involved with the proposed amendment have been evaluated, focusing on the three standards set forth in 10 CFR 50.92(c) as quoted below:

> The Commission may make a final determination, pursuant to the procedures in paragraph 50.91, that a proposed amendment to an operating license for a facility licensed under paragraph 50.21(b) or paragraph 50.22 or for a testing facility involves no significant hazards consideration, if operation of the facility in accordance with the proposed amendment would not:
>
> (1) Involve a significant increase in the probability or consequences of an accident previously evaluated; or
>
> (2) Create the possibility of a new or different kind of accident from any accident previously evaluated; or
>
> (3) Involve a significant reduction in a margin of safety.

The following evaluation is provided for the no significant hazards consideration standards.

1. Does the change involve a significant increase in the probability or consequences of an accident previously evaluated?

   Some steam generator tubes have been found to have a varying amount of wall degradation. When the degradation is extensive, the normal practice of plugging defective tubes reduces the effectiveness of the steam generators and eventually will reduce the performance of the nuclear steam supply system. An alternative to plugging tubes is installing a sleeve as a new pressure boundary inside the original tube to bridge the degraded area, thus permitting

the tubes to remain in service. The integrity of the repaired steam generator tubes will be equivalent to that of the original tube and will allow the tube to continue performing its heat transfer function.

The proposed change allows the installation of steam generator tube sleeves in accordance with the vendor methodologies provided by the B&W Kinetic welded sleeving process described in NRC approved topical report BAW-2094P, Revision 1 and the Westinghouse laser welded sleeving process described in WCAP-13483, Revision 1, provided for NRC review and acceptance. The sleeve installation procedures described in BAW-2094P, Revision 1 will be revised to include the kinetic sleeve "tooling" and installation process parameter changes described in NRC approved BAW-2045PA, Revision 1, January 1992, "Recirculating Steam Generators Kinetic Qualification for 3/4 Inch OD Tubes." These changes were incorporated to resolve field problems or to improve the sleeve installation rate and will not alter the basic installed configuration of the sleeve as described in BAW-2094P, Revision 1. We have reviewed the methodology described in BAW 2094P, Revision 1 and determined that they are applicable to the Beaver Valley units and provide a safe and efficient alternative to plugging. We have reviewed the methodologies described in these vendor reports and determined that they provide a safe and efficient alternative to plugging. Eddy current techniques are available to perform sleeve and tube inspections for defect detection and to verify proper installation of the sleeve. Available techniques are capable of providing adequate defect sensitivity in the required areas of the tube and sleeve pressure boundary. Proprietary methods described in the vendor reports with supporting qualification data demonstrate the inspectability of the sleeve and underlying tube. In addition, we are committing to qualify the adequacy of any system that is used for periodic inservice inspection and to evaluate and, if practical, implement testing methods as better methods are developed and qualified for use.

The structural integrity of the repaired tube is restored to that of an undegraded tube and the tube and sleeves will be inspected periodically in accordance with the technical specification surveillance requirements. Sleeving does not affect the UFSAR steam generator tube rupture accident, therefore, the proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Does the change create the possibility of a new or different kind of accident from many accident previously evaluated?

Both the structural integrity and the heat transfer capability of the steam generators will not be significantly affected by the installation of sleeves. In addition, the

sleeves are attached to the inside of the tubes and cannot interact with any of the other plant systems. The sleeves have been analyzed and tested and the repair methods have been evaluated to ensure they satisfy the required design conditions. Sleeving returns the degraded tube to a serviceable condition and the sleeved tube functions in essentially the same manner as the original tube. Therefore, the proposed change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Does the change involve a significant reduction in a margin of safety?

The heat transfer capabilities of the steam generators will be improved by utilizing the sleeving process rather than the currently required plugging. Installing sleeves slightly reduces the RCS flow and heat transfer capabilities, however, this reduction is significantly less than that of tubes that have been plugged. Sleeving maintains the structural integrity of the steam generators to ensure the RCS pressure boundary is adequate for the expected design conditions, therefore, the proposed change does not involve a significant reduction in the margin of safety.

F. NO SIGNIFICANT HAZARDS CONSIDERATION DETERMINATION

Based on the considerations expressed above, it is concluded that the activities associated with this license amendment request satisfies the no significant hazards consideration standards of 10 CFR 50.92(c) and, accordingly, a no significant hazards consideration finding is justified.

ATTACHMENT C-1

Beaver Valley Power Station, Unit No. 1
Proposed Technical Specification Change No. 205
TYPED REPLACEMENT PAGES

Typed Pages:

	3/4 4-8	
	3/4 4-9	
	3/4 4-10	
	3/4 4-10a	
	3/4 4-10b	
	3/4 4-10c	shifted backward
	3/4 4-10d	shifted backward
	3/4 4-10e	shifted backward
B	3/4 4-1	shifted forward
B	3/4 4-1a	shifted forward
B	3/4 4-2	shifted forward
B	3/4 4-2a	

REACTOR COOLANT SYSTEM

3/4.4.5 STEAM GENERATORS

LIMITING CONDITION FOR OPERATION

3.4.5 Each steam generator shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

With one or more steam generators inoperable, restore the inoperable generator(s) to OPERABLE status prior to increasing Tavg above 200°F.

SURVEILLANCE REQUIREMENTS

4.4.5.1 Steam Generator Sample Selection and Inspection - Each steam generator shall be determined OPERABLE during shutdown by selecting and inspecting at least the minimum number of steam generators specified in Table 4.4-1.

4.4.5.2 Steam Generator Tube Sample Selection and Inspection - The steam generator tube minimum sample size, inspection result classification, and the corresponding action required shall be as specified in Table 4.4-2. The inservice inspection of steam generator tubes shall be performed at the frequencies specified in Specification 4.4.5.3 and the inspected tubes shall be verified acceptable per the acceptance criteria of Specification 4.4.5.4. Steam generator tubes shall be examined in accordance with Article 8 of Section V ("Eddy current Examination of Tubular Products") and Appendix IV to Section XI ("Eddy Current Examination of Nonferromagnetic Steam Generator Heat Exchanger Tubing") of the applicable year and addenda of the ASME Boiler and Pressure Vessel Code required by 10CFR50, Section 50.55a(g). When applying the exceptions of 4.4.5.2.a through 4.4.5.2.c, previous defects or imperfections in the area repaired by sleeving are not considered an area requiring reinspection. The tubes selected for each inservice inspection shall include at least 3% of the total number of tubes in all steam generators; the tubes selected for these inspections shall be selected on a random basis except:

a. 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 these critical areas.

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

1. All nonplugged tubes that previously had detectable wall penetrations greater than 20%, and

SURVEILLANCE REQUIREMENTS (Continued)

2. Tubes in those areas where experience has indicated potential problems, and

3. At least 3% of the total number of sleeved tubes in all three steam generators. A sample size less than 3% is acceptable provided all the sleeved tubes in the steam generator(s) examined during the refueling outage are inspected. These inspections will include both the tube and the sleeve, and

4. A tube inspection pursuant to Specification 4.4.5.4.a.8. If any selected tube does not permit the passage of the eddy current probe for a tube or sleeve inspection, this shall be recorded and an adjacent tube shall be selected and subjected to a tube inspection.

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 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.

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

Category	Inspection Results
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.

SURVEILLANCE REQUIREMENTS (Continued)

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 or sleeves must exhibit significant (greater than 10%) further wall penetrations to be included in the above percentage calculations.

4.4.5.3 Inspection Frequencies - The above required inservice inspections of steam generator tubes shall be performed at the following frequencies:

a. 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 following service under AVT conditions, 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.

b. If the inservice inspection of a steam generator conducted in accordance with Table 4.4-2 requires a third sample inspection whose results fall in Category C-3, the inspection frequency shall be reduced to at least once per 20 months. The reduction in inspection frequency shall apply until a subsequent inspection demonstrates that a third sample inspection is not required.

c. Additional, unscheduled inservice inspections shall be performed on each steam generator in accordance with the first sample inspection specified in Table 4.4-2 during the shutdown subsequent to any of the following conditions:

1. Primary-to-secondary tube leaks (not including leaks originating from tube-to-tube sheet welds) in excess of the limits of Specification 3.4.6.2,

2. A seismic occurrence greater than the Operating Basis Earthquake,

SURVEILLANCE REQUIREMENTS (Continued)

3. A loss-of-coolant accident requiring actuation of the engineered safeguards, or

4. A main steam line or feedwater line break.

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 means a tube or sleeve containing imperfections greater than or equal to 20% of the nominal wall thickness caused by degradation.

4. % Degradation means the percentage of the tube or sleeve wall thickness affected or removed by degradation.

5. Defect means an imperfection of such severity that it exceeds the plugging or repair limit. A tube containing a defect is defective. Any tube which does not permit the passage of the eddy-current inspection probe shall be deemed a defective tube.

6. Plugging or Repair Limit means the imperfection depth at or beyond which the tube shall be removed from service by plugging or repaired by sleeving in the affected area because it may become unserviceable prior to the next inspection. The plugging or repair limit imperfection depths are specified in percentage of nominal wall thickness as follows:

a.	Original tube wall	40%
b.	Babcock & Wilcox kinetic welded sleeve wall	40%
c.	Westinghouse laser welded sleeve wall	31%

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 4.4.5.3.c, above.

8. Tube Inspection means an inspection of the steam generator tube from the point of entry (hot leg side) completely around the U-bend to the top support to the cold leg.

9. Tube Repair refers to sleeving which is used to maintain a tube in-service or return a tube to service. This includes the removal of plugs that were installed as a corrective or preventive measure. The following sleeve designs have been found acceptable:

   a) Babcock & Wilcox kinetic welded sleeves, BAW-2094P, Revision 1 including kinetic sleeve "tooling" and installation process parameter changes.

   b) Westinghouse laser welded sleeves, WCAP-13483, Revision 1.

b. The steam generator shall be determined OPERABLE after completing the corresponding actions (plug or repair all tubes exceeding the plugging or repair limit) 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 and sleeve inservice inspection shall be submitted to the Commission in a Special Report pursuant to Specification 6.9.2 within 12 months following the 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.

SURVEILLANCE REQUIREMENTS (Continued)

c. Results of steam generator tube inspections which fall into Category C-3 shall be reported to the Commission pursuant to Specification 6.6 prior to resumption of plant operation. The written report shall provide a description of investigations conducted to determine the cause of the tube degradation and corrective measures taken to prevent recurrence.

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TABLE 4.4-1

MINIMUM NUMBER OF STEAM GENERATORS TO BE

INSPECTED DURING INSERVICE INSPECTION

Preservice Inspection	No			Yes		
No. of Steam Generators per Unit	Two	Three	Four	Two	Three	Four
First Inservice Inspection	All			One	Two	Two
Second & Subsequent Inservice Inspections	One[1]			One[1]	One[2]	One[3]

Table Notation:

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

2. The other steam generator not inspected during the first inservice inspection shall be inspected. The third and subsequent inspections should follow the instructions described in 1 above.

3. Each of the other two steam generators not inspected during the first inservice inspections shall be inspected during the second and third inspections. The fourth and subsequent inspections shall follow the instructions described in 1 above.

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
			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. Notification to NRC pursuant to Specification 6.6	All other S.G.s are C-1	None	N/A	N/A
			Some S.G.s C-2 but no additional S.G.s 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. Notification to NRC pursuant to Specification 6.6.	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.

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BASES

3/4.4.1 REACTOR COOLANT LOOPS

The plant is designed to operate with all reactor coolant loops in operation and maintain DNBR above the design DNBR limit during all normal operations and anticipated transients. In Modes 1 and 2, with one reactor coolant loop not in operation, THERMAL POWER is restricted to less than or equal to 31 percent of RATED THERMAL POWER until the Overtemperature ΔT trip is reset. Either action ensures that the DNBR will be maintained above the design DNBR limit. A loss of flow in two loops will cause a reactor trip if operating above P-7 (11 percent of RATED THERMAL POWER) while a loss of flow in one loop will cause a reactor trip if operating above P-8 (31 percent of RATED THERMAL POWER).

In MODE 3, a single reactor coolant loop provides sufficient heat removal capability for removing decay heat; however, due to the initial conditions assumed in the analysis for the control rod bank withdrawal from a subcritical condition, two operating coolant loops are required to meet the DNB design basis for this Condition II event.

In MODES 4 and 5, a single reactor coolant loop or RHR subsystem provides sufficient heat removal capability for removing decay heat; but single failure considerations require that at least two loops be OPERABLE. Thus, if the reactor coolant loops are not OPERABLE, this specification requires two RHR loops to be OPERABLE.

The operation of one Reactor Coolant Pump or one RHR pump provides adequate flow to ensure mixing, prevent stratification and produce gradual reactivity changes during boron concentration reductions in the Reactor Coolant System. The reactivity change rate associated with boron reduction will, therefore, be within the capability of operator recognition and control.

The restrictions on starting a Reactor Coolant Pump with one or more RCS cold legs less than or equal to 275°F are provided to prevent RCS pressure transients, caused by energy additions from the secondary system, which could exceed the limits of Appendix G to 10 CFR Part 50. The RCS will be protected against overpressure transients and will not exceed the limits of Appendix G by either (1) restricting the water level in the pressurizer and thereby providing a volume for the primary coolant to expand into or (2) by restricting starting of the RCPs to when the secondary water temperature of each steam generator is less than 25°F above each of the RCS cold leg temperatures.

Power is removed from the isolated loop stop valves (hot leg and cold leg) to ensure that no reactivity addition to the core can

BASES

3/4.4.1 REACTOR COOLANT LOOPS, (continued)

occur while the loop is isolated due to inadvertent opening of the isolated loop stop valves. Isolated loop startup is limited to Modes 5 and 6 in accordance with the NRC SER on N-1 loop operation. Verification of the isolated loop boron concentration prior to opening the isolated loop stop valves provides a reassurance of the adequacy of the shutdown margin in the remainder of the system. Restoration of power to the hot leg stop valve allows opening this valve to complete the recirculation flowpath in conjunction with the relief line bypassing the cold leg stop valve and ensures adequate mixing in the isolated loop. This enables the temperature and boron concentration of the isolated loop to be brought to equilibrium with the remainder of the system. Limiting the temperature differential between the isolated loop and the remainder of the system prior to opening the cold leg stop valve prevents any significant reactivity effects due to cool water addition to the core.

Startup of an idle loop will inject cool water from the loop into the core. The reactivity transient resulting from this cool water injection is minimized by delaying isolated loop startup until its temperature is within 20°F of the operating loops. Making the reactor subcritical prior to loop startup prevents any power spike which could result from this cool water induced reactivity transient.

3/4.4.2 and 3/4.4.3 SAFETY VALVES

The pressurizer code safety valves operate to prevent the RCS from being pressurized above its Safety Limit of 2735 psig. Each safety valve is designed to relieve 345,000 lbs. per hour of saturated steam at the valve set point. The relief capacity of a single safety valve is adequate to relieve any overpressure condition which could occur during shutdown. In the event that no safety valves are OPERABLE, an operating RHR loop, connected to the RCS, provides overpressure relief capability and will prevent RCS overpressurization.

During operation, all pressurizer code safety valves must be OPERABLE to prevent the RCS from being pressurized above its safety limit of 2735 psig. The combined relief capacity of all of these valves is greater than the maximum surge rate resulting from a complete loss of load assuming no reactor trip until the first Reactor Protective System trip set point is reached (i.e., no credit is taken for a direct reactor trip on the loss of load) and also assuming no operation of the power operated relief valves or steam dump valves.

BASES

3/4.4.2 and 3/4.4.3 SAFETY VALVES (Continued)

Demonstration of the safety valves' lift settings will occur only during shutdown and will be performed in accordance with the provisions of Section XI of the ASME Boiler and Pressure Code.

3/4.4.4 PRESSURIZER

The requirement that (150)kw of pressurizer heaters and their associated controls be capable of being supplied electrical power from an emergency bus provides assurance that these heaters can be energized during a loss of offsite power condition to maintain natural circulation at HOT STANDBY.

3/4.4.5 STEAM GENERATORS

One OPERABLE steam generator in a non-isolated reactor coolant loop provides sufficient heat removal capability to remove decay heat after a reactor shutdown. The requirement for two OPERABLE steam generators, combined with other requirements of the Limiting Conditions for Operation ensures adequate decay heat removal capabilities for RCS temperatures greater than 350°F if one steam generator becomes inoperable due to single failure considerations. Below 350°F, decay heat is removed by the RHR system.

The Surveillance Requirements for inspection of the steam generator tubes ensure that the structural integrity of this portion of the RCS will be maintained. 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 that lead to corrosion. 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 plant is expected to be operated in a manner such that the secondary coolant will be maintained within those parameter limits found to result in negligible corrosion of the steam generator tubes. If the secondary coolant chemistry is not maintained within these parameter limits, localized corrosion may likely result in stress corrosion cracking. The extent of cracking during plant

3/4.4.5 STEAM GENERATORS (Continued)

operation would be limited by the limitation of steam generator tube leakage between the primary coolant system and the secondary coolant system (primary-to-secondary leakage = 500 gallons per day per steam generator). Cracks having a primary-to-secondary leakage less than this limit during operation will have an adequate margin of safety to withstand the loads imposed during normal operation and by postulated accidents. Operating plants have demonstrated that primary-to- secondary leakage of 500 gallons per day per steam generator can readily be detected by radiation monitors of steam generator blowdown. Leakage in excess of this limit will require plant shutdown and an unscheduled inspection, during which the leaking tubes will be located and plugged.

Wastage-type defects are unlikely with the all volatile treatment (AVT) of secondary coolant. However, even if a defect of similar type should develop in service, it will be found during scheduled inservice steam generator tube examinations. Plugging or repair will be required of all tubes with imperfections exceeding the plugging or repair limit. Degraded steam generator tubes may be repaired by the installation of sleeves which span the degraded tube section. A steam generator tube with a sleeve installed meets the structural requirements of tubes which are not degraded, therefore, the sleeve is considered a part of the tube. The surveillance requirements identify those sleeving methodologies approved for use. If an installed sleeve is found to have through wall penetration greater than or equal to the plugging limit, the tube must be plugged. The plugging limit for the sleeve is derived from R.G. 1.121 analysis which utilizes a 20% allowance for eddy current uncertainty in determining the depth of tube wall penetration and additional degradation growth. Steam generator tube inspections of operating plants have demonstrated the capability to reliably detect degradation that has penetrated 20% of the original tube wall thickness.

Whenever the results of any steam generator tubing inservice inspection fall into Category C-3, these results will be reported to the Commission pursuant to Specification 6.6 prior to resumption of plant operation. Such cases will be considered by the Commission on a case-by-case basis and may result in a requirement for analysis, laboratory examinations, tests, additional eddy-current inspection, and revision of the Technical Specifications, if necessary.

ATTACHMENT C-2

Beaver Valley Power Station, Unit No. 2
Proposed Technical Specification Change No. 71
TYPED REPLACEMENT PAGES

Typed Pages:

	3/4 4-11	
	3/4 4-12	
	3/4 4-13	
	3/4 4-14	
	3/4 4-14a	added
	3/4 4-14b	added
	3/4 4/16	
B	3/4 4-3	
B	3/4 4-3a	added

3/4.4.5 STEAM GENERATORS

LIMITING CONDITION FOR OPERATION

3.4.5 Each steam generator shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

With one or more steam generators inoperable, restore the inoperable generator(s) to OPERABLE status prior to increasing T_{avg} above 200°F.

SURVEILLANCE REQUIREMENTS

4.4.5.1 Steam Generator Sample Selection and Inspection - Each steam generator shall be determined OPERABLE during shutdown by selecting and inspecting at least the minimum number of steam generators specified in Table 4.4-1.

4.4.5.2 Steam Generator Tube Sample Selection and Inspection - The steam generator tube minimum sample size, inspection result classification, and the corresponding action required shall be as specified in Table 4.4-2. The inservice inspection of steam generator tubes shall be performed at the frequencies specified in Specification 4.4.5.3 and the inspected tubes shall be verified acceptable per the acceptance criteria of Specification 4.4.5.4. Steam generator tubes shall be examined in accordance with Article 8 of Section V ("Eddy Current Examination of Tubular Products") and Appendix IV to Section XI ("Eddy Current Examination of Nonferromagnetic Steam Generator Heat Exchanger Tubing") of the applicable year and addenda of the ASME Boiler and Pressure Vessel Code required by 10CFR50, Section 50.55a(g). When applying the exceptions of 4.4.5.2.a through 4.4.5.2.c, previous defects or imperfections in the area repaired by sleeving are not considered an area requiring reinspection. The tubes selected for each inservice inspection shall include at least 3% of the total number of tubes in all steam generators; the tubes selected for these inspections shall be selected on a random basis except:

a. 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 these critical areas.

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

SURVEILLANCE REQUIREMENTS (Continued)

1. All nonplugged tubes that previously had detectable wall penetrations greater than 20%, and

2. Tubes in those areas where experience has indicated potential problems, and

3. At least 3% of the total number of sleeved tubes in all three steam generators. A sample size less than 3% is acceptable provided all the sleeved tubes in the steam generator(s) examined during the refueling outage are inspected. These inspections will include both the tube and the sleeve, and

4. A tube inspection pursuant to Specification 4.4.5.4.a.8. If any selected tube does not permit the passage of the eddy current probe for a tube or sleeve inspection, this shall be recorded and an adjacent tube shall be selected and subjected to a tube inspection.

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 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.

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

Category	Inspection Results
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.

SURVEILLANCE REQUIREMENTS (Continued)

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 or sleeves must exhibit significant (greater than 10%) further wall penetrations to be included in the above percentage calculations.

4.4.5.3 Inspection Frequencies - The above required inservice inspections of steam generator tubes shall be performed at the following frequencies:

a. 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 following service under All Volatile Treatment (AVT) conditions, 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.

b. If the inservice inspection of a steam generator conducted in accordance with Table 4.4-2 requires a third sample inspection whose results fall in Category C-3, the inspection frequency shall be reduced to at least once per 20 months. The reduction in inspection frequency shall apply until a subsequent inspection demonstrates that a third sample inspection is not required.

c. Additional, unscheduled inservice inspections shall be performed on each steam generator in accordance with the first sample inspection specified in Table 4.4-2 during the shutdown subsequent to any of the following conditions:

1. Primary-to-secondary tube leaks (not including leaks originating from tube-to-tube sheet welds) in excess of the limits of Specification 3.4.6.2,

2. A seismic occurrence greater than the Operating Basis Earthquake,

SURVEILLANCE REQUIREMENTS (Continued)

3. A loss-of-coolant accident requiring actuation of the engineered safeguards, or

4. A main steam line or feedwater line break.

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 means a tube or sleeve containing imperfections greater than or equal to 20% of the nominal wall thickness caused by degradation.

4. % Degradation means the percentage of the tube or sleeve wall thickness affected or removed by degradation.

5. Defect means an imperfection of such severity that it exceeds the plugging or repair limit. A tube containing a defect is defective. Any tube which does not permit the passage of the eddy-current inspection probe shall be deemed a defective tube.

6. Plugging or Repair Limit means the imperfection depth at or beyond which the tube shall be removed from service by plugging or repaired by sleeving in the affected area because it may become unserviceable prior to the next inspection. The plugging or repair limit imperfection depths are specified in percentage of nominal wall thickness as follows:

a.	Original tube wall	40%
b.	Babcock & Wilcox kinetic welded sleeve wall	40%
c.	Westinghouse laser welded sleeve wall	31%

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 4.4.5.3.c, above.

8. Tube Inspection means an inspection of the steam generator tube from the point of entry (hot leg side) completely around the U-bend to the top support to the cold leg.

9. Tube Repair refers to sleeving which is used to maintain a tube in-service or return a tube to service. This includes the removal of plugs that were installed as a corrective or preventive measure. The following sleeve designs have been found acceptable:

   a) Babcock & Wilcox kinetic welded sleeves, BAW-2094P, Revision 1 including kinetic sleeve "tooling" and installation process parameter changes.

   b) Westinghouse laser welded sleeves, WCAP-13483, Revision 1.

b. The steam generator shall be determined OPERABLE after completing the corresponding actions (plug or repair all tubes exceeding the plugging or repair limit) 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 and sleeve inservice inspection shall be submitted to the Commission in a Special Report pursuant to Specification 6.9.2 within 12 months following the 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.

SURVEILLANCE REQUIREMENTS (Continued)

c. Results of steam generator tube inspections which fall into Category C-3 shall be reported to the Commission pursuant to Specification 6.6 prior to resumption of plant operation. The written report shall provide a description of investigations conducted to determine the cause of the tube degradation and corrective measures taken to prevent recurrence.

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
			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. Notification to NRC pursuant to 50.72 (b)(2) of 10 CFR Part 50	All other S.G.s are C-1	None	N/A	N/A
			Some S.G.s C-2 but no additional S.G.s 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. Notification to NRC pursuant to 50.72 (b) (2) of 10 CFR Part 50	N/A	N/A

$S = \frac{2}{n}\%$ Where n is the number of steam generators inspected during an inspection.
during an inspection.

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3/4.4.5 STEAM GENERATORS (Continued)

decay heat removal capabilities for RCS temperatures greater than 350°F if one steam generator becomes inoperable due to single failure considerations. Below 350°F, decay heat is removed by the RHR system.

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

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3/4.4.5 STEAM GENERATORS (Continued)

repaired by the installation of sleeves which span the degraded tube section. A steam generator tube with a sleeve installed meets the structural requirements of tubes which are not degraded, therefore, the sleeve is considered a part of the tube. The surveillance requirements identify those sleeving methodologies approved for use. If an installed sleeve is found to have through wall penetration greater than or equal to the plugging limit, the tube must be plugged. The plugging limit for the sleeve is derived from R.G. 1.121 analysis which utilizes a 20% allowance for eddy current uncertainty in determining the depth of tube wall penetration and additional degradation growth. Steam generator tube inspections of operating plants have demonstrated the capability to reliably detect degradation that has penetrated 20% of the original tube wall thickness.

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ATTACHMENT D

Beaver Valley Power Station, Unit Nos. 1 and 2
Proposed Technical Specification Change Nos. 205 and 71
WESTINGHOUSE SLEEVING REPORT

WCAP-13483, Revision 1

Beaver Valley Units 1 and 2,
Westinghouse Series 51
Steam Generator Sleeving Report

Laser Welded Sleeves

ATTACHMENT E

Beaver Valley Power Station, Unit Nos. 1 and 2
Proposed Technical Specification Change Nos. 205 and 71
WESTINGHOUSE APPLICATION FOR WITHHOLDING

[redacted]

The following are included:

Westinghouse Letter, Application For Withholding Proprietary Information From Public Disclosure

Accompanying Affidavit

Proprietary Information Notice

Copyright Notice