ENCLOSURE

PROPOSED CHANGES TO TECHNICAL SPECIFICATIONS
BROWNS FERRY NUCLEAR PLANT
(DOCKET NOS. 50-259, -260, -296)

UNITS 1 AND 2
PROPOSED CHANGES

LIST OF TABLES (Cont'd)

LIST OF ILLUSTRATIONS

3.6 PRIMARY SYSTEM BOUNDARY

H. Seismic Restraints, Supports and Snubbers

1. During all modes of operation except Cold Shutdown and Refuel, all seismic restraints, supports and snubbers shall be operable except as noted in 3.6.H.2 and 3.6.H.3 below. All safety-related snubbers are listed in surveillance instruction BF SI 4.6.H.

2. With one or more seismic restraint, support or snubber inoperable, within 72 hours replace or restore the inoperable seismic restraint(s), support(s) or snubber(s) to OPERABLE status and perform an engineering evaluation on the attached component or declare the attached system inoperable and follow the appropriate LIMITING CONDITION statement for that system.

3. If a seismic restraint, support or snubber (SRSS) is determined to be inoperable while the reactor is in the shutdown or refuel mode, that SRSS shall be made operable or replaced prior to reactor startup. If the inoperable SRSS

4.6 PRIMARY SYSTEM BOUNDARY

H. Seismic Restraints, Supports and Snubbers

The surveillance requirements of paragraph 4.6.G are the only requirements that apply to any seismic restraint or support other than snubbers.

Each safety-related snubber shall be demonstrated OPERABLE by performance of the following augmented inservice inspection program and the requirements of Specification 3.6.H/4.6.H. These snubbers are listed in surveillance instruction BF SI 4.6.H.

1. Inspection Groups

The snubbers may be categorized into two major groups based on whether the snubbers are accessible or inaccessible during reactor operation. These major groups may be further subdivided into groups based on design, environment or other features which may be expected to affect the operability of the snubbers within the group. Each group may be inspected independently in accordance with 4.6.H.2 through 4.6.H.9.

2. Visual Inspection, Schedule, and Lot Size

The first inservice visual inspection of snubbers not previously included in these technical specifications and whose visual inspection has not been performed and documented previously, shall be performed within six months for accessible snubbers and before resuming power after the first refueling outage for inaccessible snubbers subsequent to being included in these specifications. The results of these inspections shall be used in the schedule table below to determine the subsequent visual inspection period. Snubbers previously included in these technical specifications shall continue on their previously earned inspection schedule without affect from adding snubbers not within their group.

H. Seismic Restraints, Supports, and Snubbers (cont'd)

3. (cont'd)
is attached to a system that is required OPERABLE during the shutdown or refuel mode, the appropriate LIMITING CONDITIONS statement for that system shall be followed.

H. Seismic Restraints, Supports, and Snubbers (cont'd)

2. Visual Inspection, Schedule, and Lot Size (cont'd)

No. Inoperable Snubbers per Inspection Period	*Subsequent Visual Inspection Period
0	18 months ± 25%
1	12 months ± 25%
2	6 months ± 25%
3,4	124 days ± 25%
5,6,7	62 days ± 25%
8 or more	31 days ± 25%

Snubber inspection groups which are at the maximum inspection interval for two successive periods may have their visual inspection lot size reduced to 50% of the snubbers within that group for succeeding visual inspection so long as no snubbers in that inspection group are determined to be inoperable, either as a result of visual inspection or functional tests. The 50% sample lots are to be alternated so that all snubbers are included within two inspection intervals. If a snubber within the inspection group is determined to be in-operable, the sample size shall revert to 100% for the current inspection and the subsequent interval shall be in accordance with the schedule table. The sample size shall remain at 100% until the provisions of this paragraph are again met.

*The inspection interval shall not be lengthened more than one step at a time.

3. Visual Inspection Performance and Evaluation

Visual inspections shall verify (1) that there are no visible indications of damage or impaired

H. Seismic Restraints, Supports, and Snubbers (cont'd)

H. Seismic Restraints, Supports, and Snubbers (cont'd)

3. Visual Inspection Performance and Evaluation (cont'd)

OPERABILITY, (2) bolts attaching the snubber to the foundation or supporting structure are secure, and (3) snubbers attached to sections of safety-related systems that have experienced unexpected potentially damaging transients since the last inspection period shall be evaluated for the possibility of concealed damage and functionally tested, if applicable, to confirm operability.

Snubbers which appear inoperable as a result of visual inspections may be determined OPERABLE for the purpose of establishing the next visual inspection interval, providing that (1) the cause of the rejection is clearly established and remedied for that particular snubber and for other snubbers that may be generically susceptible; and (2) the affected snubber is functionally tested, if applicable, in the as-found condition and determined OPERABLE per Specification 4.6.H.5.

Also, snubbers which have been made inoperable as the result of unexpected transients, isolated damage or other such random events, when the provisions of 4.6.H.7 and 4.6.H.8 have been met and any other appropriate corrective action implemented, shall not be counted in determining the next visual inspection interval.

4. Functional Test Schedule, Lot Size, and Composition

At least once per 18 months during shutdown, a representative sample of 10% of the total of each group of snubbers in use in the plant shall be functionally tested either in place or in a bench test.

The representative sample selected for functional testing shall include the various configurations, operating

H. Seismic Restraints, Supports, and Snubbers (cont'd)

H. Seismic Restraints, Supports, and Snubbers (cont'd)

4. Functional Test Schedule, Lot Size, and Composition (cont'd)

environments, and the range of size and capacity of snubbers within the groups. The representative sample should be weighted to include more snubbers from severe service areas such as near heavy equipment.

The security of fasteners for attachment of the snubbers to the component and to the snubber anchorage shall be verified on snubbers selected for functional tests.

5. Functional Test Acceptance Criteria

The snubber functional test shall verify that:

a. Activation (restraining action) is achieved in both tension and compression.

b. Snubber bleed, or release where required, is present in both compression and tension.

c. The force required to initiate or maintain motion of the snubber is not great enough to overstress the attached piping or component during thermal movement, or to indicate impending failure of the snubber.

d. For snubbers specifically required not to displace under continuous load, the ability of the snubber to withstand load without displacement shall [illegible] fied.

6. Functional Test Failure Analysis and Additional Test Lots

An engineering evaluation shall be made of each failure to meet the functional test acceptance criteria to determine the cause of the failure. The result of this analysis shall be used if applicable, in selecting snubbers to be tested in the

H. Seismic Restraints, Supports, and Snubbers (cont'd)

H. Seismic Restraints, Supports, and Snubbers (cont'd)

6. Functional Test Failure Analysis and Additional Test Lots (cont'd)

subsequent lot in an effort to determine the operability of other snubbers which may be subject to the same failure mode. Selection of snubbers for future testing may also be based on the failure analysis. For each snubber that does not meet the functional test acceptance criteria, an additional lot equal to 10% of the remainder of that group of snubbers shall be functionally tested. Testing shall continue until no additional inoperable snubbers are found within subsequent lots or all snubbers of the original inspection group have been tested or all suspect snubbers identified by the failure analysis have been tested, as applicable.

The discovery of loose or missing attachment fasteners will be evaluated to determine whether the cause may be localized or generic. The result of the evaluation will be used to select other suspect snubbers for verifying the attachment fasteners, as applicable.

7. Functional Test Failure - Attached Component Analysis

For the snubber(s) found inoperable, an engineering evaluation shall be performed on the components which are restrained by the snubber(s). The purpose of this engineering evaluation shall be to determine if the components restrained by the snubber(s) were adversely affected by the inoperability of the snubber(s), and in order to ensure that the restrained component remains capable of meeting the designed service.

8. Functional Testing of Repaired and Spare Snubbers

Snubbers which fail the visual inspection or the functional test

H. Seismic Restraints, Supports, and Snubbers (cont'd)

H. Seismic Restraints, Supports, and Snubbers (cont'd)

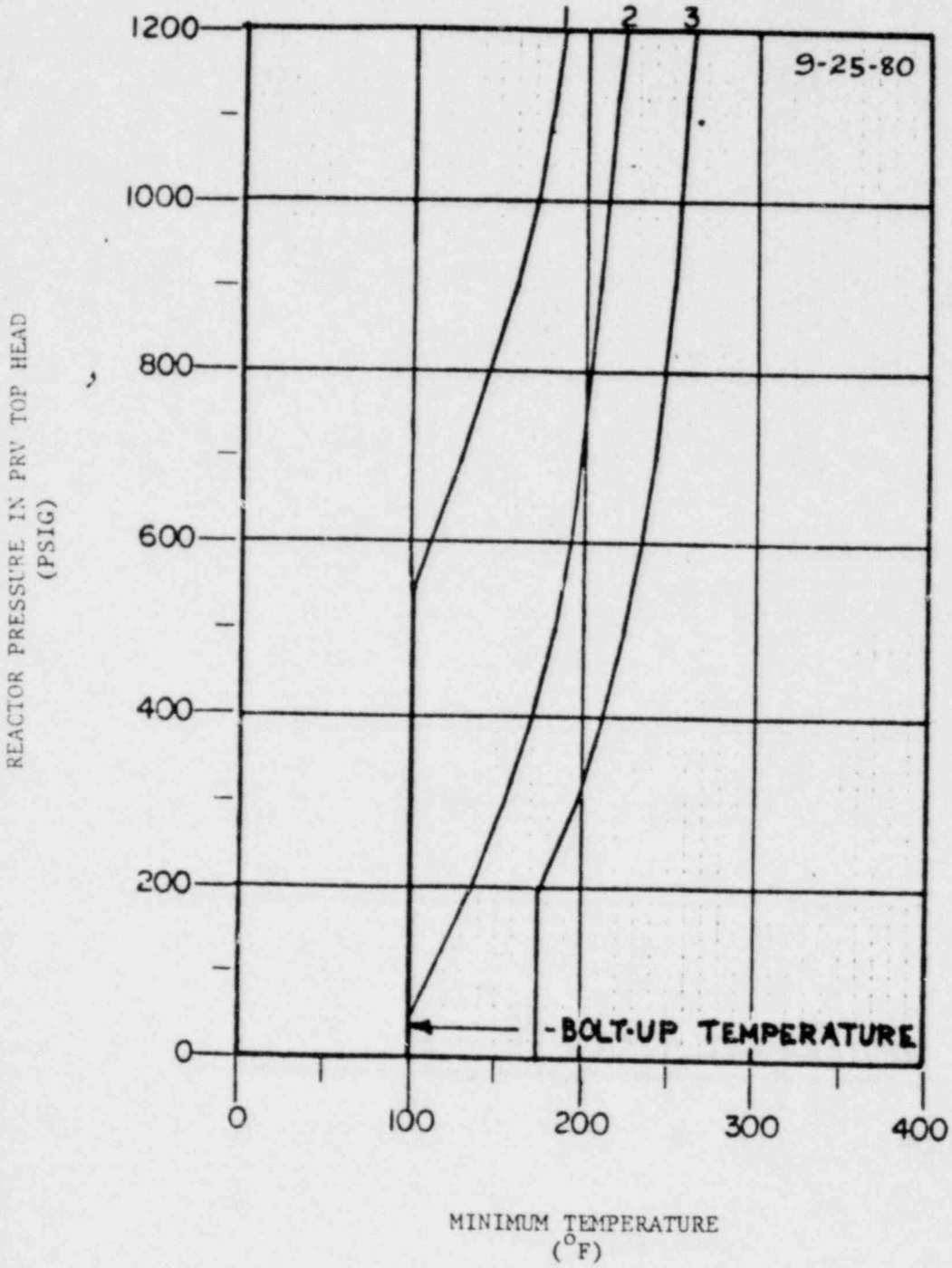
8. Functional Testing of Repaired and Spare Snubbers (cont'd)

acceptance criteria shall be repaired or replaced. Replacement snubbers and snubbers which have repairs which might affect the functional test results shall meet the functional test criteria before installation in the unit. These snubbers shall have met the acceptance criteria subsequent to their most recent service, and the functional test must have been performed within 12 months before being installed in the unit.

9. Exemption From Visual Inspection or Functional Tests

Permanent or other exemptions from visual inspections and/or functional testing for individual snubbers may be granted by the Commission if a justifiable basis for exemption is presented and if applicable snubber life destructive testing was performed to qualify snubber operability for the applicable design conditions at either the completion of their fabrication or at a subsequent date. Snubbers so exempted shall continue to be listed in the plant instructions with footnotes indicating the extent of the exemptions.

Figure 3.6-1



Curve #1
Minimum temperature for pressure tests such as required by Section XI.

Curve #2
Minimum temperature for mechanical heat up or cooldown following nuclear shutdown.

Curve #3
Minimum temperature for core operation (criticality) Includes additional margin required by 10CFR50 Appendix G, Par. IV A.2.C.

Notes
These curves are shifted 30°F to the right of the original set of curves to include a ΔRT_{NDT} of 30°F. This shift will allow these curves to be used thru 4.0 EFPY.

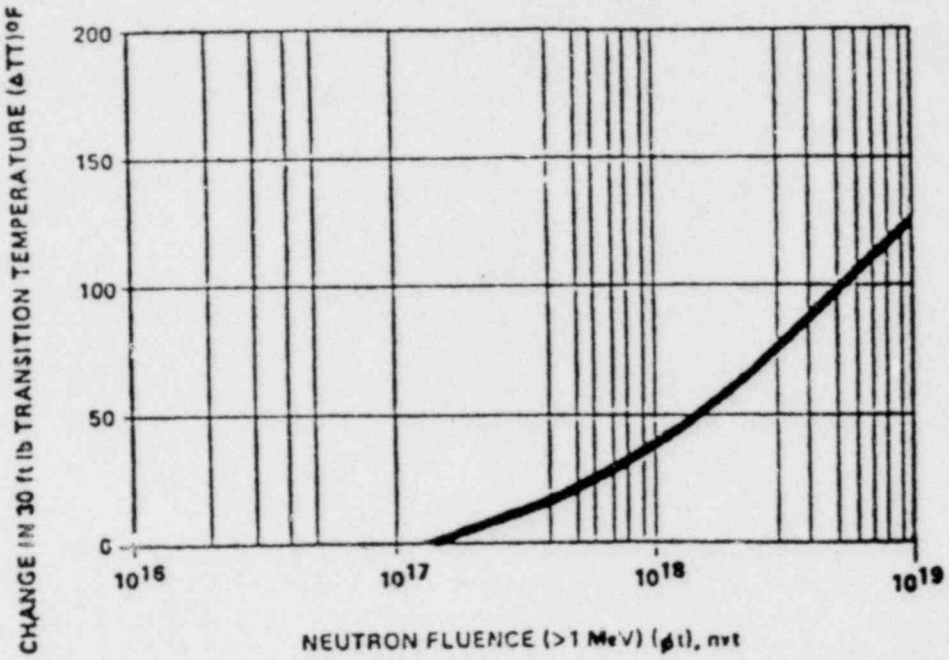


FIGURE 3.6-2
CHANGE IN CHARPY V TRANSITION TEMPERATURE
VERSUS
NEUTRON EXPOSURE

PAGES 193-208 DELETED

3.6.H/4.6.H Seismic Restraints, Supports and Snubbers

Seismic restraints, supports, and snubbers (SRSS) are designed to prevent unrestrained pipe or component motion under dynamic loads as might occur during an earthquake or severe transient, while allowing normal thermal motion during startup and shutdown. The consequence of an inoperable SRSS is an increase in the probability of structural damage to piping or components as a result of a seismic or other event initiating dynamic loads. It is therefore required that all SRSS required to protect the primary coolant system or any other safety system or component be operable during reactor operation.

Because the SRSS protection is required only during relatively low probability events, a period of 72 hours is allowed to replace or restore the inoperable SRSS(s) to operable status and perform an engineering evaluation on the supported component or declare the supported system inoperable and follow the appropriate limiting condition for operation statement for that system. The engineering evaluation is performed to determine whether the mode of failure of the SRSS has adversely affected any safety-related component or system.

3.6/4.6 BASES

All safety-related snubbers are visually inspected for overall integrity and operability. The inspection will include verification of proper orientation, adequate fluid level if applicable, and proper attachment of the snubber to piping and structures. The removal of insulation or the verification of torque values for threaded fasteners is not required for visual inspections.

The inspection frequency is based upon maintaining a constant level of snubber protection. Thus, the required inspection interval varies inversely with the observed snubber failures. The number of inoperable snubbers found during a required inspection determines the time interval for the next required inspection. Inspections performed before that interval has elapsed may be used as a new reference point to determine the next inspection. However, the results of such early inspections performed before the original required time interval has elapsed (nominal time less 25 percent) may not be used to lengthen the required inspection interval. Any inspection whose results require a shorter inspection interval will override the previous schedule.

When the cause of the rejection of a snubber in a visual inspection is clearly established and remedied for that snubber and for any other snubbers that may be generically susceptible and operability verified by inservice functional testing, if applicable, that snubber may be exempted from being counted as inoperable. Generically susceptible snubbers are those which are of a specific make or model and have the same design features directly related to rejection of the snubber, or are similarly located or exposed to the same environmental conditions such as temperature, radiation, and vibration. Inspection groups may be established based on design features, and installed conditions which may be expected to be generic. Each of these inspection groups are inspected and tested separately unless an engineering analysis indicates the inspection group is improperly constituted. All suspect snubbers are subject to inspection and testing regardless of inspection groupings.

To further increase the assurance of snubber reliability, functional tests shall be performed at least once each 18 months during shutdown, usually during the refueling outage.

These tests will include stroking of the snubbers to verify proper movement, activation, and bleed or release. Ten percent represents an adequate sample for such tests. Observed failures on these samples will require an engineering analysis and testing of additional units. A thorough inspection of the snubber threaded attachments to the pipe or components and the anchorage will be made in conjunction with all required functional tests.

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UNIT 3
PROPOSED CHANGES

Amendment No.

LIST OF ILLUSTRATIONS

Amendment No.

3.6 PRIMARY SYSTEM BOUNDARY

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4.6 PRIMARY SYSTEM BOUNDARY

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1. Inspection Groups

The snubbers may be categorized into two major groups based on whether the snubbers are accessible or inaccessible during reactor operation. These major groups may be further subdivided into groups based on design, environment or other features which may be expected to affect the operability of the snubbers within the group. Each group may be inspected independently in accordance with 4.6.H.2 through 4.6.H.9.

2. Visual Inspection, Schedule, and Lot Size

The first inservice visual inspection of snubbers not previously included in these technical specifications and whose visual inspection has not been performed and documented previously, shall be performed within six months for accessible snubbers and before resuming power after the first refueling outage for inaccessible snubbers subsequent to being included in these specifications. The results of these inspections shall be used in the schedule table below to determine the subsequent visual inspection period. Snubbers previously included in these technical specifications shall continue on their previously earned inspection schedule without affect from adding snubbers not within their group.

H. Seismic Restraints, Supports, and Snubbers (cont'd)

3. (cont'd)
is attached to a system that is required OPERABLE during the shutdown or refuel mode, the appropriate LIMITING CONDITIONS statement for that system shall be followed.

H. Seismic Restraints, Supports, and Snubbers (cont'd)

2. Visual Inspection, Schedule, and Lot Size (cont'd)

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*The inspection interval shall not be lengthened more than one step at a time.

3. Visual Inspection Performance and Evaluation

Visual inspections shall verify (1) that there are no visible indications of damage or impaired

H. Seismic Restraints, Supports, and Snubbers (cont'd)

H. Seismic Restraints, Supports, and Snubbers (cont'd)

3. Visual Inspection Performance and Evaluation (cont'd)

OPERABILITY, (2) bolts attaching the snubber to the foundation or supporting structure are secure, and (3) snubbers attached to sections of safety related systems that have experienced unexpected potentially damaging transients since the last inspection period shall be evaluated for the possibility of concealed damage and functionally tested, if applicable, to confirm operability.

Snubbers which appear inoperable as a result of visual inspections may be determined OPERABLE for the purpose of establishing the next visual inspection interval, providing that (1) the cause of the rejection is clearly established and remedied for that particular snubber and for other snubbers that may be generically susceptible; and (2) the affected snubber is functionally tested, if applicable, in the as-found condition and determined OPERABLE per Specification 4.6.H.5.

Also, snubbers which have been made inoperable as the result of unexpected transients, isolated damage or other such random events, when the provisions of 4.6.H.7 and 4.6.H.8 have been met and any other appropriate corrective action implemented, shall not be counted in determining the next visual inspection interval.

4. Functional Test Schedule, Lot Size, and Composition

At least once per 18 months during shutdown, a representative sample of 10% of the total of each group of snubbers in use in the plant shall be functionally tested either in place or in a bench test.

The representative sample selected for functional testing shall include the various configurations, operating

H. Seismic Restraints, Supports, and Snubbers (cont'd)

H. Seismic Restraints, Supports, and Snubbers (cont'd)

4. Functional Test Schedule, Lot Size, and Composition (cont'd)

environments, and the range of size and capacity of snubbers within the groups. The representative sample should be weighted to include more snubbers from severe service areas such as near heavy equipment.

The security of fasteners for attachment of the snubbers to the component and to the snubber anchorage shall be verified on snubbers selected for functional tests.

5. Functional Test Acceptance Criteria

The snubber functional test shall verify that:

a. Activation (restraining action) is achieved in both tension and compression.

b. Snubber bleed, or release where required, is present in both compression and tension.

c. The force required to initiate or maintain motion of the snubber is not great enough to overstress the attached piping or component during thermal movement, or to indicate impending failure of the snubber.

d. For snubbers specifically required not to displace under continuous load, the ability of the snubber to withstand load without displacement shall be verified.

6. Functional Test Failure Analysis and Additional Test Lots

An engineering evaluation shall be made of each failure to meet the functional test acceptance criteria to determine the cause of the failure. The result of this analysis shall be used, if applicable, in selecting snubbers to be tested in the

H. Seismic Restraints, Supports, and Snubbers (cont'd)

H. Seismic Restraints, Supports, and Snubbers (cont'd)

6. Functional Test Failure Analysis and Additional Test Lots (cont'd)

subsequent lot in an effort to determine the operability of other snubbers which may be subject to the same failure mode. Selection of snubbers for future testing may also be based on the failure analysis. For each snubber that does not meet the functional test acceptance criteria, an additional lot equal to 10% of the remainder of that group of snubbers shall be functionally tested. Testing shall continue until no additional inoperable snubbers are found within subsequent lots or all snubbers of the original inspection group have been tested or all suspect snubbers identified by the failure analysis have been tested, as applicable.

The discovery of loose or missing attachment fasteners will be evaluated to determine whether the cause may be localized or generic. The result of the evaluation will be used to select other suspect snubbers for verifying the attachment fasteners, as applicable.

7. Functional Test Failure - Attached Component Analysis

For the snubber(s) found inoperable, an engineering evaluation shall be performed on the components which are restrained by the snubber(s). The purpose of this engineering evaluation shall be to determine if the components restrained by the snubber(s) were adversely affected by the inoperability of the snubber(s), and in order to ensure that the restrained component remains capable of meeting the designed service.

8. Functional Testing of Repaired and Spare Snubbers

Snubbers which fail the visual inspection or the functional test

H. Seismic Restraints, Supports, and Snubbers (cont'd)

H. Seismic Restraints, Supports, and Snubbers (cont'd)

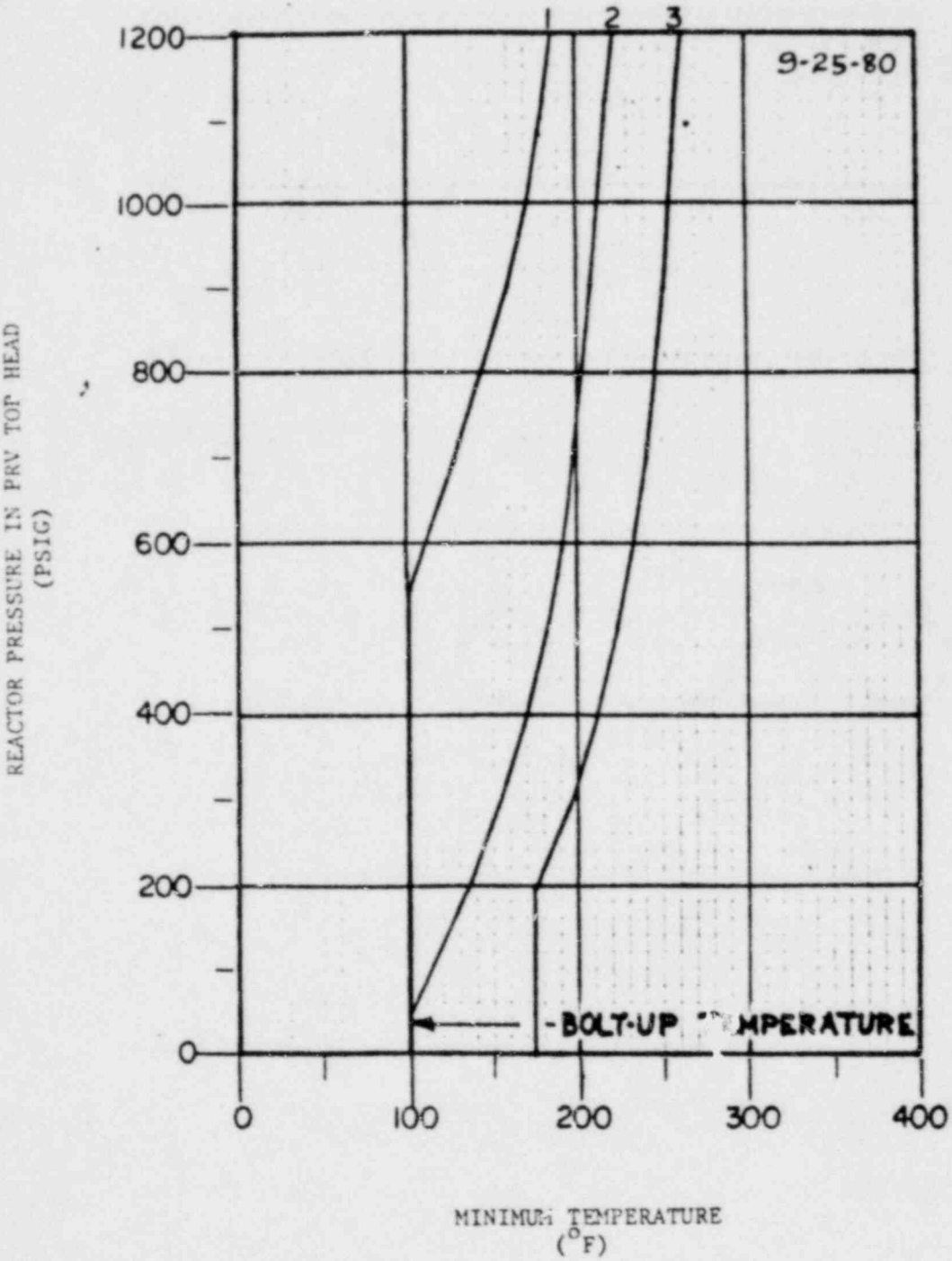
8. Functional Testing of Repaired and Spare Snubbers (cont'd)

acceptance criteria shall be repaired or replaced. Replacement snubbers and snubbers which have repairs which might affect the functional test results shall meet the functional test criteria before installation in the unit. These snubbers shall have met the acceptance criteria subsequent to their most recent service, and the functional test must have been performed within 12 months before being installed in the unit.

9. Exemption From Visual Inspection or Functional Tests

Permanent or other exemptions from visual inspections and/or functional testing for individual snubbers may be granted by the Commission if a justifiable basis for exemption is presented and if applicable snubber life destructive testing was performed to qualify snubber operability for the applicable design conditions at either the completion of their fabrication or at a subsequent date. Snubbers so exempted shall continue to be listed in the plant instructions with footnotes indicating the extent of the exemptions.

Figure 3.6-1



Curve #1
Minimum temperature for pressure tests such as required by Section XI.

Curve #2
Minimum temperature for mechanical heat up or cooldown following nuclear shutdown.

Curve #3
Minimum temperature for core operation (criticality) Includes additional margin required by 10CFR50 Appendix G, Par. IV A.2.C.

Notes
These curves are shifted 30°F to the right of the original set of curves to include a ΔRT_{NDT} of 30°F. This shift will allow these curves to be used thru 4.0 EFPY.

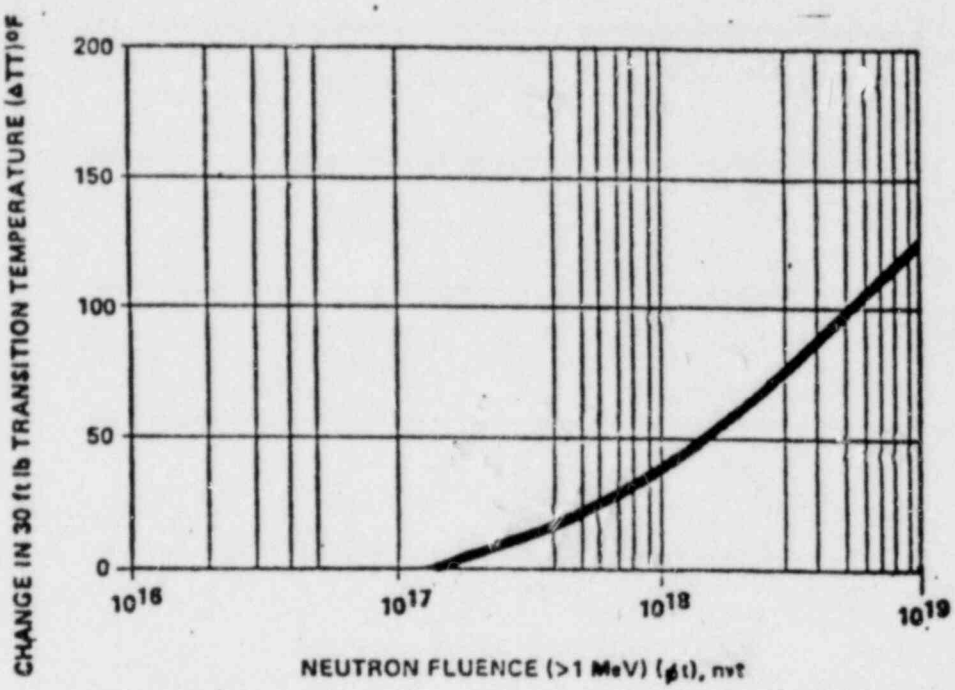


FIGURE 3.6-2
CHANGE IN CHARPY V TRANSITION TEMPERATURE
VERSUS
NEUTRON EXPOSURE

Table 4.6.A

REACTOR COOLANT SYSTEM INSERVICE INSPECTION SCHEDULE

AREAS OF INTEREST	ACCESS	% INSP. IN INSP. INTERVAL	FREQUENCY	METHOD
A. Reactor Vessel				
1. Longitudinal and circumferential welds outside core region and in vessel head	Those welds above sacrificial shield and all in closure head are accessible from vessel o.d.	10% of accessible longitudinal 5% of accessible circumferential	Code (1)	Volumetric
2. Vessel-to-flange circumferential weld	From flange surface	100%	Code (2)	Volumetric
Head-to-flange circumferential weld	From o.d. of head	100%	Code (2)	Volumetric
3. Primary nozzle-to-vessel welds and nozzle-to-vessel inside radii	All nozzles 4 inches and greater will be accessible from vessel o.d.	100% welds	Code (2)	
		Inside radii at the 6 and 12 o'clock positions	Code (2)	Volumetric
3a. CRD housing-to-stub tube and stub tube-to-vessel welds and incore penetration	During refueling from CRD area for signs of leakage	100%	At time of system hydrostat	Visual
4. Primary nozzles to safe-end Dissimilar Metal welds	All nozzles 4 inches and larger will be accessible	100%	Code (2)	Visual, surface, and volumetric
5. Closure studs and nuts	Studs in place, nuts on removal	100%	Code (2)	Visual, surface, and volumetric

Table 4.6.A
REACTOR COOLANT SYSTEM INSERVICE INSPECTION SCHEDULE

AREAS OF INTEREST	ACCESS	% INSP. IN INSP. INTERVAL	FREQUENCY	METHOD
6. Closure washers,	On removal	100%	Code (2)	Visual
Bushings	In place, when studs are removed	When made accessible		Visual
7. Integrally welded vessel supports	Two sections 2 feet long each, 18° apart, accessible in support skirt to vessel weld	One foot minimum length 180° apart - two spots	Code (2)	Volumetric
8. Vessel cladding	During refueling - vessel i.d.	6 predetermined patches (36 in.² each)	Code (2)	Visual
9. Vessel internals and integrally welded internal supports	Accessible areas during normal refueling	Accessible areas	First refueling and every third refueling thereafter	Visual
10. Vessel flange-ligaments between threaded stud holes	During refueling	100%	Code (2)	Volumetric
B. Piping Pressure Boundary				
1. Vessel, pump, and valve safe ends-to-primary pipe dissimilar metal welds and safe ends in branch piping welds 4 inches and larger	From pipe o.d.	100%	Code (2)	Visual and surface and volumetric

Table 4.6.A

REACTOR COOLANT SYSTEM INSERVICE INSPECTION SCHEDULE

AREAS OF INTEREST	ACCESS	% INSP. IN INSP. INTERVAL	FREQUENCY	METHOD
2. Circumferential and longitudinal pipe welds 4 inches and over	Removable insulation	25% of circumferential welds plus 1 foot of adjacent longitudinal welds	Code (2)	Visual and volumetric
Circumferential-type welds - pipe whip protection	Removable Insulation	All those listed in Section 4.6.G.4 of Technical Specifications	Code (1)	Visual and volumetric
3. Pressure-retaining bolting	2 inches and larger	100%	Code (1)	Visual and volumetric
	Bolting under 2 inches on piping 4 inches and over	100%	Signs of leakage during normal maintenance	Visual
4. Piping supports and hangers				
a. Integrally welded	Scaffolding - as required	100% visual, 25% Vol. (if suitable geometry)	Code (2)	Visual and volumetric
b. Nonintegrally welded supports	Scaffolding - as required	100%	Code (2)	Visual
C. Pump Pressure Boundary				
1. Pump casing				

Table 4.6.A

REACTOR COOLANT SYSTEM INSERVICE INSPECTION SCHEDULE

AREAS OF INTEREST	ACCESS	% INSP. IN INSP. INTERVAL	FREQUENCY	METHOD
Pump pressure boundary interior	From pump i.d. only when maintenance requires removal of internals	One pump with or without welds if disassembled	Code (1) if disassembled	Visual
2. Pressure-retaining bolting	2 inches and larger	100%	Code (1)	Visual and volumetric
	Bolting under 2 inches	100%	Signs of leakage during normal maintenance outage	Visual
3. Supports				
a. Integrally welded	Scaffolding as required	25%	Code (2)	Visual and volumetric
b. Nonintegrally welded	Scaffolding as required	100%	Code (2)	Visual
4. Nozzle-to-safe end dissimilar metal welds	Removable insulation	100%	Code (2) volumetric	Visual and
D. Valve Pressure Boundary				
1. Valve body seam welds	From valve o.d.	100%	Code (1)	Visual and volumetric

Table 4.6.A

REACTOR COOLANT SYSTEM INSERVICE INSPECTION SCHEDULE

AREAS OF INTEREST	ACCESS	% INSP. IN INSP. INTERVAL	FREQUENCY	METHOD
Valve pressure boundary interior	From valve i.d. only when maintenance requires removal of internals	One valve with or without welds if disassembled	Code (1) if disassembled	Visual
2. Valve-to-safe end dissimilar metal welds	Removal insulation	100%	Code (2)	Visual and volumetric
3. Pressure-retaining bolting	2 inches and larger	100%	Code (1)	Visual and volumetric
	Bolting under 2 inches	100%	Signs of leakage during normal maintenance outage	Visual
4. Supports and hangers -				
a. Integrally welded	Scaffolding - as required	25% Vol. (if suitable geometry) 100% visual	Code (2)	Visual and volumetric
b. Nonintegrally welded	Scaffolding - as required	100%	Code (2)	Visual

Table 4.6.A

REACTOR COOLANT SYSTEM INSERVICE INSPECTION SCHEDULE

AREAS OF INTEREST	ACCESS	% INSP. IN INSP. INTERVAL	FREQUENCY	METHOD

Inspection Frequency:

Code (1) - Program such that all areas of interest will be inspected during the inspection interval.

Code (2) - Program such that at least 25% of the required examinations shall have been completed after one-third of the inspection interval has expired (with credit for no more than 33-1/3% if additional examinations are completed) and at least 50% after two-thirds of the inspection interval has expired (with credit for no more than 66-2/3%). The remainder shall be completed by the end of the inspection interval.

Pages 212-219 Deleted

3.6/4.6 BASES

It is intended that the required examinations and inspection be completed during each 10-year interval. The periodic examinations are to be done during refueling outages or other extended plant shutdown periods.

Only proven nondestructive testing techniques will be used.

More frequent inspections shall be performed on certain circumferential pipe welds as listed in Section 4.6.G.4 to provide additional protection against pipe whip. These welds were selected in respect to their distance from hangers or supports wherein a failure of the weld would permit the unsupported segments of pipe to strike the drywell wall or nearby auxiliary systems or control systems. Selection was based on judgment from actual plant observation of hanger and support locations and review of drawings. Inspection of all these welds during each 10-year inspection interval will result in three additional examinations above the requirements of Section XI of ASME Code.

REFERENCES

1. Inservice Inspection and Testing (BFNP FSAR Subsection 4.12)

2. Inservice Inspection of Nuclear Reactor Coolant Systems, Section XI, ASME Boiler and Pressure Vessel Code

3. ASME Boiler and Pressure Vessel Code, Section III (1968 edition)

4. American Society for Nondestructive Testing No. SNT-TC-1A (1968 edition)

3.6.H/4.6.H Seismic Restraints, Supports and Snubbers

Seismic restraints, supports and snubbers (SRSS) are designed to prevent unrestrained pipe or component motion under dynamic loads as might occur during an earthquake or severe transient, while allowing normal thermal motion during startup and shutdown. The consequence of an inoperable SRSS is an increase in the probability of structural damage to piping or components as a result of a seismic or other event initiating dynamic loads. It is therefore required that all SRSS required to protect the primary coolant system or any other safety system or component be operable during reactor operation.

Because the SRSS protection is required only during relatively low probability events, a period of 72 hours is allowed to replace or restore the inoperable SRSS(s) to operable status and perform an engineering evaluation on the supported component or declare the supported system inoperable and follow the appropriate limiting condition for operation statement for that system. The engineering evaluation is performed to determine whether the mode of failure of the SRSS has adversely affected any safety-related component or system.

3.6/4.6 BASES

All safety-related snubbers are visually inspected for overall integrity and operability. The inspection will include verification of proper orientation, adequate fluid level if applicable, and proper attachment of the snubber to piping and structures. The removal of insulation or the verification of torque values for threaded fasteners is not required for visual inspections.

The inspection frequency is based upon maintaining a constant level of snubber protection. Thus, the required inspection interval varies inversely with the observed snubber failures. The number of inoperable snubbers found during a required inspection determines the time interval for the next required inspection. Inspections performed before that interval has elapsed may be used as a new reference point to determine the next inspection. However, the results of such early inspections performed before the original required time interval has elapsed (nominal time less 25 percent) may not be used to lengthen the required inspection interval. Any inspection whose results require a shorter inspection interval will override the previous schedule.

When the cause of the rejection of a snubber in a visual inspection is clearly established and remedied for that snubber and for any other snubbers that may be generically susceptible and operability verified by inservice functional testing, if applicable, that snubber may be exempted from being counted as inoperable. Generically susceptible snubbers are those which are of a specific make or model and have the same design features directly related to rejection of the snubber, or are similarly located or exposed to the same environmental conditions such as temperature, radiation, and vibration. Inspection groups may be established based on design features, and installed conditions which may be expected to be generic. Each of these inspection groups are inspected and tested separately unless an engineering analysis indicates the inspection group is improperly constituted. All suspect snubbers are subject to inspection and testing regardless of inspection groupings.

To further increase the assurance of snubber reliability, functional tests shall be performed at least once each 18 months during shutdown, usually during the refueling outage.

These tests will include stroking of the snubbers to verify proper movement, activation, and bleed or release. Ten percent represents an adequate sample for such tests. Observed failures on these samples will require an engineering analysis and testing of additional units. A thorough inspection of the snubber threaded attachments to the pipe or components and the anchorage will be made in conjunction with all required functional tests.

Page 230 Deleted

ENCLOSURE 2

JUSTIFICATION

TVA has maintained at Browns Ferry, in addition to the Technical Specification required surveillance program for hydraulic snubbers, a surveillance program for mechanical snubbers. The program for mechanical snubbers includes both visual inspections and functional tests intended to verify operability in a manner similar to inspections and tests of hydraulic snubbers. It is implemented by plant instruction BF-MMI 59D, which replaced the earlier instruction BF-MMI 36. In some respects, these instructions have required a more stringent surveillance program than does the technical specifications for hydraulic snubbers.

In the proposed revision to the Browns Ferry Technical Specifications, we have deleted the modifying word "hydraulic" when referring to snubbers so that the scope of the Technical Specification is increased to include all safety-related snubbers regardless of design.

Recognizing that there are differences in design within the broad family of hydraulic snubbers and within the broad family of mechanical snubbers, the proposed technical specification will permit the establishment of inspection groups based on design differences which may be expected to affect the operability of the snubbers within that group. IE Bulletin No. 81-01 also apparently recognizes these differences in that different inspection criteria and inspection schedules are specified based on the manufacturer (i.e., design) of the mechanical snubbers covered by that bulletin.

The proposed Technical Specification also permits the establishment of inspection groups based on the application, considering such factors as environment or duty cycle imposed on the snubbers. This approach meets the intent of the Standard Technical Specifications provisions for selecting 25% of the functional test representative sample from three specific catagories relative to the application of the snubbers within the plant.

Provisions are also made to reduce the visual inspection lot size to 50% for snubber inspection groups which have had no inoperable snubbers for two successive inspections, with the stipulations that inspection lots be alternated so that all snubbers are inspected regularly, and that when a snubber within the group is determined to be inoperable, the lot size immediately reverts to 100% and the inspection interval changes in accordance with the inspection schedule table. This provision, while affording relief from inspecting snubbers, which by their performance have indicated such frequent inspections are not necessary, is expected to detect deterioration in the performance of snubbers whose operability has previously been established.

Establishing snubber inspection groups based on design characteristics and upon application in the plant, and providing for reduced visual inspection lot size based on successful plant experience, we believe meets the intent of the Standard Technical Specification and incorporates the central provisions of the concensus standard being developed under the auspices of the American Society of Mechanical Engineer's Committee on Operations and Maintenance.

The provisions of the Standard Technical Specifications for entering the visual inspection schedule have been adapted for inclusion in the Technical Specifications of the operating plants which have been performing inspection of snubbers and for including snubbers not previously included in the Technical Specifications. The inspection results for mechanical snubbers obtained in accordance with plant instructions forms the basis for entering the schedule table at whatever level the results of the first Technical Specification inspection dictate.

The visual inspection criteria have generally been adopted. The requirement to functionally test all snubbers to verify their operability from a possible inoperable status has been modified to specify "if applicable." Loose attachment bolts or missing clevis pins should not, for this reason only, require the functional testing of the snubbers. Likewise, the successful completion of an as-found functional test, regardless of the apparent fluid level at the snubber, should be sufficient to establish the operability of the hydraulic snubber. Some common reservoirs for hydraulic snubbers have long hose or piping runs which may contain more than enough fluid to permit all connected snubbers to perform their required function even when the reservoir is empty. The option for as-found functional testing should always be available to verify snubber operability.

The functional testing lot size has been changed in accordance with the Standard Technical Specification from '10 or 10%, whichever is less' to 10% of each inspection group. Any required resampling will be at 10% of the remaining snubbers. This sample size will apply to a population of approximately 150 hydraulic snubbers and 50 mechanical snubbers in each unit at Browns Ferry.

The sample composition within each inspection group may be more heavily weighted for snubbers from severe duty locations, and the composition of sample lots resulting from failed snubbers will be based on an evaluation of the snubber failure mode.

Functional testing criteria have been consolidated for both hydraulic and mechanical snubbers. Verification of drag force to establish that it is not excessive relative to loads imposed on the attached components, or that there is no indication of impending failure of the snubber is also included. The requirement to verify the attachment fasteners, both to the component and to the anchorage, is included for snubbers selected for functional testing. The discovery of missing or loose fasteners requires an evaluation and verification of additional fasteners, rather than additional functional tests be performed. This detailed inspection of the fasteners in conjunction with the functional tests in intended to supplement the visual inspections.

Functional testing is required of repaired or spare snubbers before their installation in the unit. This requirement in conjunction with the application of the failure analysis to the composition of lots required for additional testing from failed snubbers and to future testing lots, as applicable, meets the concern of the Standard Technical Specification requirement to repeat functional tests on both repaired and spare snubbers installed in locations where failed snubbers have been discovered. The selection of snubbers for additional testing based on an analysis of failed snubbers will require the testing of snubbers with a suspected common defect and will serve the same purpose as requiring additional exclusive testing based on two specific failure modes.

An engineering evaluation is to be performed relative to the effect on the attached component of any snubber which fails the functional test acceptance criteria.

Either temporary, permanent, partial, or complete exemptions from visual inspections or functional testing are to be justified to NRC. The former blanket exemption from functional testing of snubbers with 50,000 pound and greater capacity has been eliminated. All safety-related snubbers are to remain on the listing in the Surveillance Instruction regardless of the degree of exemption granted. The degree of exemption is to be indicated for each snubber.

The service life monitoring intent is covered by preventive maintenance programs and through the provisions of the surveillance program itself. The consequences of the visual inspection and functional test failures are significant enough to encourage action to ensure that the snubbers remain operable within the operating interval between inspections and tests. The specified individual snubber maintenance and installation records review require unnecessary time that could be better spent on productive tasks. In addition to duplication of some existing programs, a large quantity of additional paperwork would be generated with a life-of-plant retention requirement. Records of major maintenance activities currently are to be retained for a five year minimum. In addition to the current seal replacement program for hydraulic snubbers, the monitoring of drag force on Pacific Scientific snubbers is expected to provide information in advance of a Pacific Scientific snubber wearing to the point of being inoperable.

The Bases as contained in the Standard Technical Specification have been incorporated into the proposed Technical Specification as is consistent with the provisions of the proposed Technical Specifications.

In addition to the proposed Technical Specifications changes enclosed, a tabulation of the inspections of mechanical snubbers, performed in accordance with BF MMI 36 and BF MMI 59D, is included. Also enclosed are the most pertinent pages from the current revision of BF MMI 59D.

BROWNS FERRY NUCLEAR PLANT

MECHANICAL SNUBBER FUNCTIONAL TEST HISTORY

UNIT	DATE	SNUBBER MFG.	TESTED NO.	TESTED %	NUMBER FAILED	MAINTENANCE INSTRUCTION/COMMENT
1 & 2	8-74	INC	14 14	100% 100%	5 11	Reported in NRC IE Bulletin 81-01 as "Unit 2 & 3"
UNIT 1 & 2 FIRE OUTAGE BEGAN 3/75 - NEW VERSION INC INSTALLED AND PSA INSTALLED ON MSRV TAILPIPES 4/76 - RESTART FROM FIRE OUTAGE 8/76						
UNIT 3 COMMERCIAL OPERATION - 3/77						
1	9-77	PSA INC	11 14	25% 100%	0 0	MMI 36
2	5-78	PSA INC	14 14	25% 100%	0 0	MMI 36
3	9-78	PSA INC	7 14	15% 100%	0 0	MMI 59D
1	11-78	PSA INC	7 14	15% 100%	0 0	MMI 59D
2	5-79	PSA INC	5 14	10% 100%	0 0	MMI 59D
3	9-79	PSA INC	7 14	15% 100%	0 0	MMI 59D
1	1-80	PSA INC	7* 14	15% 100%	0 0	MMI 59D
2	11-80	PSA INC	46 14	100% 100%	0 0	MMI 59D
3	12-80	PSA INC	41 14	90% 100%	0 0	MMI 59D

*UNIT 1 (2-80) 53 PSA PIPE CLAMP NUTS STAKED - WORKORDER 000-9190

7.0 ALARA Considerations (Continued)

7.2 Compare personnel exposure rates and attempt to use those people with the least exposure.

8.0 Instruction

8.1 General Surveillance Requirements

8.1.1 Yarway columns in each unit are equipped with a total of 14 International Nuclear Safe Guard Corporation snubbers. All (100%) of these snubbers are to be tested during the refueling outage of the unit in which they are installed.

8.1.2 All steam relief valve piping and the main steam lines A and D in the dyrwell are equipped with Pacific Scientific snubbers as follows:

	Number of Snubbers Installed		
	Unit 1	Unit 2	Unit 3
On relief valve piping	*49	42	44
ON MS lines A and D	4	4	4
	*53	46	48

A sufficient number of snubbers shall be tested each refueling outage so that all snubbers will be tested within ten-year periods. For annual refueling outages ten percent (5 snubbers) and for 18 months between refueling outages [illegible] percent (7 snubbers) are to be tested. During the end-of-cycle-test all snubbers that have not previously been tested within the previous ten-year period are to be tested. To assure that representative samples of snubbers in the system are tested, they are to be tested in the sequence in which they are listed on the data sheets (the exact sequence is not required within a batch). Figure 2 (page 22) is included as an overall location plan and the individual installations are shown on pages 23-41.

*Revision

9. Testing

9.1 See Caution. International Nuclear Safe Guard Corporation snubbers on the two Yarway columns are to be observed for freedom of movement by moving the piping with the snubbers attached. Move the pipe in different directions in order to more directly activate each snubber of the cluster. The snubbers may be observed on the two vertical 3/4-inch pipes at the two locations near the core spray lines on the third and fourth elevations in the drywell. If the action of the snubber is in doubt, it is to be disconnected and stroked separate from the line.

CAUTION: Do not move Yarway piping to an extreme degree at locations remote from snubber attachments.

9.2 If any of the snubbers do not travel through its full stroke or has been damaged, it is to be replaced by a snubber of the same configuration from Power Stores prior to startup of the unit.

9.3 Pacific Scientific snubbers are to be tested as follows:

9.3.1 See Caution. Disconnect the snubber from its attachment by removing the four bolts from the mounting flange (refer to Figure 1.)

CAUTION: Do not rotate one end of any Pacific Scientific snubber relative to its other end. This twisting will damage internal parts.

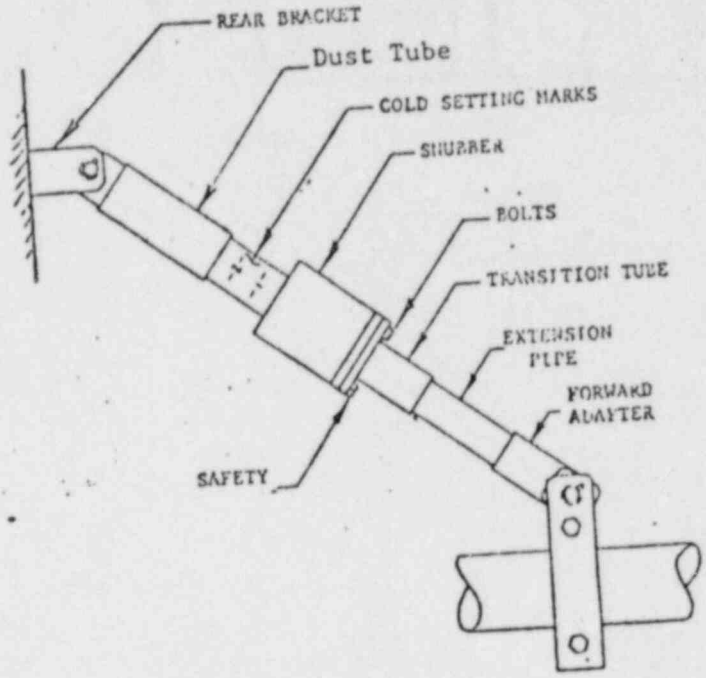


FIGURE 1 TYPICAL INSTALLATION

9. Testing (Continued)

9.3. (Continued)

9.3.2 Swing the attachment and/or the snubber to the side so that the snubber may be moved through its six-inch stroke in both directions. If the attachment will not pivot sufficiently, the lock nut on the threaded extension may be loosened and the extension screwed in to provide clearance, if so equipped. It these procedures do not provide sufficient clearance, the pin connecting the attachment to the lug may be removed, using a brass bar or soft-faced hammer to prevent marring the end of the pin.

9. Testing (Continued)

9.3 (Continued)

9.3.3 See Caution. Move the snubber through its full travel in both directions, applying force by hand attempting to increase the speed of the snubber. Note whether the snubber resists increased speed with the force applied and whether it travels smoothly through the full six-inch stroke.

CAUTION: Slow the snubber speed before it reaches the end of its stroke. The internal parts of the snubber rotate at high rates of speed, and coming to a sudden stop at the end of the stroke can cause damage to the snubber.

9.3.4 Snubbers which lock-up preventing the full six-inch stroke or move without resistance, are inoperable and are to be replaced with new snubbers of the same configuration from Power Stores prior to startup of the unit.

NOTE: The PSA-10 Snubbers originally installed are a model not currently manufactured by Pacific Scientific. They are painted with white epoxy and are rated at 10,000 pounds design load. The spares in Power Stores are the later design which have a zinc-nickel cad protective coating and have a 15,000 pound design rating. These snubbers are dimensionally and functionally interchangeable.

9.3.5 When a Pacific Scientific snubber is determined to be inoperable an additional refueling interval batch of snubbers is to be tested. For each snubber determined to be inoperable an additional batch of snubbers shall be tested until no additional snubbers fail or all snubbers have been tested. (The snubbers tested during the next refueling outage shall be insequence after any snubbers tested in compliance with this paragraph.)

10. Return to Service

10.1 Upon completion of the functional test bring the snubber and its attachment back into alignment and into contact with each other. (If an attachment pin has been removed be sure it is free of burs and coated with an approved anti-seized compound* before reinstallation.) Note the cold position setting as indicated by "cold setting marks" (figure 1) paint stenciled on the snubber. The line through the middle of the "3" should be aligned with the edge of the dust tube since the cold position setting of all these snubbers is "midrange" according to the detail installation drawings. If the cold position setting is not "3," and the snubber has an adjustable extension, adjust the extension to achieve the proper cold position setting. Many of the installations do not have any adjustment and the as-found reading is to be recorded.

10.2 Make sure the locking tab is on the bolt, apply an approved anti-seized compound* to the threads, and thread the bolts through the attachment into the flange of the snubber. Tighten the bolts to approximately 40 foot pounds. Bend the lock tab up against a flat of the hex head bolt and down over the edge of the flange to prevent loosening the bolt.

10.3 Observe the snubber for any evidence of damage, tighten any extension lock nuts, and check the clamp attachment nuts for tightness. See that lock wires are installed on the screws which hold the dust tubes in place. Generally observe the snubber and its attachments for any condition which would prevent its functioning

*Fel-Pro N-1000 or "Never Seize" pure nickle compound special nuclear grate NG-165

10. Return to Service (Continued)

10.3 (Continued)

during its cycle between test, record and take appropriate action.

10.4 Attach or update a linen tag to the snubber (or snubber location) starting by the person responsible. Fill out and submit the required data sheets.