3.6.H Shock Suppressors (Snubbers)

1. During all modes of operation except Cold Shutdown and Refuel, all safety related snubbers shall be operable except as noted in 3.6.H.2 through 3.6.H.5 below.

2. The snubbers listed in Tables 3.6.1, 3.6.2, and 3.6.3 are reqVuried to protect the primary coolant system or other safety related systems or components. All others are therefore exempt from these specifications.

3. With one or more snubbers inoperable, within 72 hours replace or restore the inoperable snubber(s) to OPERABLE status and perform an engineering evaluation per Specification 4.6.H.4 on the supported component or declare the supported system inoperable and follow the appropriate ACTION statement for that system.

4. If a snubber is determined to be inoperable while the reactor is in the shutdown or refuel mode, the snubber shall be made operable or replaced prior to reactor startup.

5. Snubbers may be added to or removed from safety related systems without prior License Amendment to Tables 3.6.1, 3.6.2, and 3.6.3, provided that a revision to these tables is included with a subsequent License Amendment request.

4.6.H Shock Suppressors (Snubbers)

The following surveillance requirements apply to all snubbers listed in Tables 3.6.1, 3.6.2, and 3.6.3.

1. All snubbers shall be visually inspected in accordance with the following schedule:

Number of Snubbers Found Inoperable During Inspection or During Inspection Interval	Next Required Inspection Interval
0	18 months $\pm$ 25%
5%	12 months $\pm$ 25%
10%	6 months $\pm$ 25%
25%	124 days $\pm$ 25%
37%	62 days $\pm$ 25%
50%	31 days $\pm$ 25%

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

Snubbers may be categorized in groups, "accessible" or "inaccessible" based on their accessibility for inspection during reactor operation and by type. These groups may be inspected independently according to the above schedule.

2. Visual Inspection Acceptance Criteria

Visual inspections shall verify (1) that there are no visible indications of damage or impaired OPERABILITY, (2) attachments to the foundation or supporting

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4.6.H Shock Suppressors (Snubbers) (cont'd)

structure are secure. 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; or (2) the affected snubber is functionally tested in the as found condition and determined OPERABLE per Specifications 4.6.H.6 or 4.6.H.7 as applicable. However, when the fluid port of a hydraulic snubber is found to be uncovered, the snubber shall be determined inoperable and cannot be determined OPERABLE via functional testing for the purpose of establishing the next visual inspection interval. All snubbers connected to an inoperable common hydraulic fluid reservoir shall be counted as inoperable snubbers.

3. At least once per 18 months during shutdown, a representative sample, 10% of the total of each type of snubber in use in the plant, shall be functionally tested either in place or in a bench test. For each snubber that does not meet the functional test acceptance criteria of Specification 4.6.4.6 or 4.6.4.7, an additional 10% of that type of snubber shall be functionally tested. Hydraulic snubbers of rated capacity greater than 50,000 lbs. need not be functionally tested.

4. The representative sample selected for functional testing shall include various configurations, operating environments and the range of size and capacity of snubbers. Tables 3.6.1, 3.6.2, and 3.6.3 may be used jointly or separately as the basis for the sampling plan.

4.6.H Shock Suppressors (Snubbers) (cont'd)

In addition to the regular sample, snubbers which failed the previous functional test shall be retested during the next test period. If a spare snubber has been installed in place of a failed snubber, then both the failed snubber (if it is repaired and installed in another position) and the spare snubber shall be retested. Test results of these snubbers may not be included for the re-sampling.

Permanent or other exemptions from functional testing for individual snubbers, in high radition zones or that are difficult to remove may be granted by the Commission only if a justifiable basis for exemption is presented and/or snubber life destructive testing was performed to qualifiy snubber operability for all design conditions at either the completion of their fabrication or at a subsequent date.

If any snubber selected for functional testing either fails to lock-up or fails to move, i.e., frozen in place, the cause will be evaluated and if caused by manufacturer or design deficiency all snubbers of the same design and subject to the same defect shall be tested or inspected to determine if the defect is present. This testing requirement shall be independent of the require ments stated above for snubbers not meeting the functional test acceptance criteria.

For the snubber(s) found inoperable, an engineering evaluation shall be performed to determine the need for further action or testing on affected components.

4.6.H Shock Suppressors (Snubbers) (cont'd)

5. Hydraulic Snubbers Functional Test Acceptance Criteria

   The hydraulic snubber functional test shall verify that:

   1. Activation (restraining action) is achieved within the specified range of velocity or acceleration in both tension and compression.

   2. Snubber bleed, or release rate, where required, is within the specified range in compression or tension.

6. Mechanical Snubbers Functional Test Acceptance Criteria

   The mechanical snubber functional test shall verify that:

   1. The force that initiates free movement of the snubber rod in either tension or compression is less than the specified maximum drag force.

   2. Activation (restraining action) is achieved within the specified range of velocity or acceleration in both tension and compression.

   3. Snubber release rate, where required, is within the specified range in compression or tension.

7. Snubber Service Life Monitoring

   A record of the service life of each snubber, the date at which the designated service life commences and the installation and maintenance records on which the designated service life is based shall be maintained as required by Specification 6.6.2.J.

4.6.H Shock Suppressors (Snubbers) (cont'd)

Concurrent with the first inservice visual inspection and at least once per 18 months thereafter, the installation and maintenance records of each snubber listed in Tables 3.6.1, 3.6.2, and 3.6.3 shall be reviewed to verify that the indicated service life has not been exceeded or will not be exceeded prior to the next scheduled snubber service life review. If the indicated service life will be exceeded prior to the next scheduled snubber service life review, the snubber service life shall be reevaluated or the snubber shall be replaced or reconditioned so as to extend its service life beyond the date of the next scheduled service life review. This reevaluation, replacement or reconditioning shall be indicated in the records.

Table 3.6.1

SAFETY RELATED HYDRAULIC SHOCK SUPPRESSORS (SNUBBERS)

Snubber No.	Location	Elevation
BS-S-1	Torus	870'
BS-S-2	Torus Area	889'
BS-S-3	Torus Area	890'
BS-S-113A	Torus Area	890'
BS-S-113B	Torus Area	891'
BS-S-116A	Torus Area	889'
BS-S-116B	Torus Area	889'
BS-S-125A	Torus Area	892'
BS-S-125B	Torus Area	891'
CS-S-1	S.E. Quad	918'
CS-S-2	S.E. Quad	929'
CS-S-3	S.E. Quad	946'
CS-S-6	S.E. Quad	918'
CS-S-7	S.E. Quad	929'
CS-VE-7	S.E. Quad	894'
CS-S-10	Rx Bldg, 931'	946'
CS-S-11	Rx Bldg, 931'	946'
CU-S-89	S.E. Torus Area	893'
HP-S-4	S.W. Quad	872'
HP-S-11	S.W. Quad	869'
HP-S-15	S.W. Quad	874'
HP-S-18A	HPCI Rm	865'
HP-S-22A	HPCI Rm	865'
MS-S-1	S.W. Quad	864'
MS-S-2	S.W. Quad	868'
MS-S-3	S.W. Quad	880'
MS-S-4	S.W. Quad	873'
MS-S-7A	S.W. Quad	874'
MS-S-7B	S.W. Quad	874'
MS-S-8	Torus Area	885'
MS-S-10	Torus Area	899'
MS-S-11	Torus Area	897'
MS-S-11A	Torus Area	897'
MS-S-12	Torus Area	888'
MS-S-12A	Torus Area	889'
MS-S-13	"B" RHR Hx Rm	904'
MS-S-13A	"B" RHR Hx Rm	905'
MS-S-13B	"B" RHR Hx Rm	911'
MS-S-14	"B" RHR Hx Rm	923'
MS-S-15	"B" RHR Hx Rm	934'
MS-S-15A	"B" RHR Hx Rm	934'
MS-S-16	Torus Area	885'
MS-S-16A	Torus Area	881'
MS-S-16B	Torus Area	881'

Table 3.6.1

SAFETY RELATED HYDRAULIC SHOCK SUPPRESSORS (SNUBBERS) (Cont'd)

Snubber No.	Location	Elevation
MS-S-17	"A" RHR Hx Rm	904'
MS-S-18	"A" RHR Hx Rm	905'
MS-S-19	"A" RHR Hx Rm	923'
MS-S-20	"A" RHR Hx Rm	934'
MS-S-20A	"A" RHR Hx Rm	934'
MS-S-23	Torus Area	898'
MS-S-24	Torus Area	898'
MS-S-25	N.E. Quad	877'
MS-S-26	N.E. Quad	879'
MS-S-75	"A" RHR Hx Rm	932'
MS-S-76	"B" RHR Hx Rm	932'
MS-S-111A	"A" RHR Hx Rm	923'
RCC-S-3	Rx Bldg, 931'	945'
RCC-S-4	Rx Bldg, 931'	943'
RCC-S-20	Rx Bldg, 931'	953'
RCC-S-21	Rx Bldg, 931'	953'
RCC-S-22	Rx Bldg, 931'	953'
RF-S-1	N.E. Quad	898'
RF-S-1A	N.E. Quad	896'
RF-S-2	N.E. Torus Area	896'
RF-S-3	HPCI Rm	870'
RF-S-4	S.W. Torus Area	894'
RF-S-5	S.W. Torus Area	897'
RF-S-6	S.W. Torus Area	891'
RF-S-45C	N.E. Quad	882'
RF-S-45D	N.E. Quad	882'
RF-S-46A	N.E. Quad	882'
RF-S-51A	N.E. Torus	897'
RF-S-51B	N E. Torus	897'
RH-S-20	Rx Bldg, 903'	912'
RH-S-21	Rx Bldg, 903'	911'
RH-S-22	Torus Area	895'
RH-S-23	Torus Area	892'
RH-S-24	Torus Area	897'
RH-S-25	N. RHR Hx Rm	927'
RH-S-25A	Rx Bldg, 903'	922'
RH-S-26	N. RHR Hx Rm	929'
RH-S-27A	"A" RHR Hx Rm	933'
RH-S-29	Rx Bldg, 903'	904'
RH-S-30A	Torus Area	898'
RH-S-30B	Torus Area	898'
RH-S-32	Torus Area	894'
RH-S-33D	Torus	892'

Table 3.6.1

SAFETY RELATED HYDRAULIC SHOCK SUPPRESSORS (SNUBBERS) (Cont'd)

Snubber No.	Location	Elevation
RH-S-34	Rx Bldg, 903'	919'
RH-S-35	S. RHR Hx Rm	912'
RH-S-36	S. RHR Hx Rm	914'
RH-S-37	S. RHR Hx Rm	916'
RH-S-38	S. RHR Hx Rm	930'
RH-S-39	S. RHR Hx Rm	927'
RH-S-40	S. RHR Hx Rm	915'
RH-S-41	S.W. Quad	873'
RH-S-42	S.W. Quad	874'
RH-S-43	Torus Area	897'
RH-S-44	S.W. Quad	884'
RH-S-45	S.W. Quad	884'
RH-S-48	N.W. Quad	884'
RH-S-49	N.W. Quad	885'
RH-S-51	N. RHR Hx Rm	914'
RH-S-52	N. RHR Hx Rm	915'
RH-S-54	N.W. Quad	873'
RH-S-55	N.W. Quad	874'
RH-S-56	N. RHR Hx Rm	927'
RH-S-57	N. RHR Hx Rm	927'
RH-S-59	Torus Area	896'
RH-S-65	S.W. Quad	887'
RH-S-66	Rx Bldg, 903'	907'
RH-S-76A	Torus Area	898'
RH-S-76B	Torus Area	898'
RH-S-77	Torus Area	890'
RH-S-78A	Torus Area	897'
RH-S-78B	Torus Area	897'
RH-S-80	N.W. Quad	889'
RH-S-96A	Rx Bldg, 903'	920'
RH-S-98	N.W. Quad	891'
RH-S-103A	S.W. Quad	876'
RH-S-107A	N.W. Quad	876'
SW-H-23A	Intake Str.	904'
SW-H-23D	Intake Str.	904'
SW-H-23E	Intake Str.	904'
SW-H-23H	Intake Str.	904'

Table 3.6.2

ACCESSIBLE SAFETY RELATED MECHANICAL SHOCK SUPPRESSORS (SNUBBERS)

Snubber No.	Location	Elevation
MS-S-9A	Torus Area	894'
MS-S-9B	Torus Area	894'
RH-S-58	"A" RHR Hx Rm	921'
RF-S-51C	N.E. Torus Area	899'
SW-H-23B	Intake Str.	904'
SW-H-23C	Intake Str.	904'
SW-H-23F	Intake Str.	904'
SW-H-23G	Intake Str.	904'

Table 3.6.3

INACCESSIBLE SAFETY RELATED MECHANICAL SHOCK SUPPRESSORS (SNUBBERS)

Snubber No.	Location	Elevation
CS-S-4	Drywell	947'
CS-S-5	Drywell	951'
CS-S-8	Drywell	947'
CS-S-9	Drywell	951'
CU-S-3A	Drywell	925'
CU-S-3B	Drywell	925'
MS-S-21	Drywell	920'
MS-S-22	Drywell	919'
MS-S-63	Drywell	921'
MS-S-149A	Steam Tunnel, Rx Bldg	918'
RF-S-8	Drywell	924'
RF-S-9	Drywell	924'
RF-S-10	Drywell	928'
RF-S-11	Drywell	924'
RF-S-12	Drywell	924'
RF-S-13	Drywell	928'
RF-S-14	Drywell	925'
RF-S-15	Drywell	922'
RF-S-16	Drywell	923'
RF-S-17	Drywell	927'
RF-S-18	Drywell	924'
RF-S-19	Drywell	924'
RH-S-3	Rx Under Shield Plug	972'
RH-S-4	Rx Cavity	972'
RH-S-5	Drywell	921'
RH-S-6	Drywell	920'
RH-S-7	Drywell	921'
RH-S-8A	Drywell	918'
RH-S-8B	Drywell	918'
RH-S-9	Drywell	915'
RH-S-10	Drywell	911'
RH-S-11	Drywell	916'
RH-S-13	Drywell	922'
RH-S-14	Drywell	921'
RH-S-15	Drywell	922'
RH-S-16	Drywell	917'
RH-S-17	Drywell	917'
RH-S-18	Drywell	916'
RH-S-19	Drywell	916'
RH-S-67	Drywell	917'
RH-S-68	Drywell	917'
RH-S-69A	Drywell	915'
RH-S-69B	Drywell	915'
RH-S-70	Drywell	916'

Table 3.6.3

INACCESSIBLE SAFETY RELATED MECHANICAL SHOCK SUPPRESSORS (SNUBBERS) (Cont'd)

Snubber No.	Location	Elevation
RH-S-71	Drywell	914'
RH-S-72	Drywell	914'
RH-S-72A	Drywell	914'
RH-S-73	Drywell	916'
SS-A2	Drywell	923'
SS-A3	Drywell	922'
SS-B2	Drywell	924'
SS-B3	Drywell	922
SS-C2	Drywell	924'
SS-C3	Drywell	922'
SS-D2	Drywell	923'
SS-D3	Drywell	923'
SS-7A1	Drywell	914'
SS-7A2	Drywell	914'
SS-7B1	Drywell	914'
SS-7B2	Drywell	914'
SS-8A1	Drywell	917'
SS-8A2	Drywell	917'
SS-1A	Drywell	891'
SS-2A	Drywell	898'
SS-3A1	Drywell	904'
SS-3A2	Drywell	904'
SS-4A	Drywell	909'
SS-5A	Drywell	898'
SS-1B	Drywell	891'
SS-2B	Drywell	898'
SS-3B1	Drywell	904'
SS-3B2	Drywell	904'
SS-4B	Drywell	909'
SS-5B	Drywell	898'
VR-S-1	Drywell	902'
VR-S-2	Drywell	919'
VR-S-3	Drywell	899'
VR-S-4	Drywell	918'
VR-S-5A	Drywell	903'
VR-S-5B	Drywell	903'
VR-S-6	Drywell	905'
VR-S-7A	Drywell	898'
VR-S-7B	Drywell	898'
VR-S-8	Drywell	899'

Table 3.6.3

INACCESSIBLE SAFETY RELATED MECHANICAL SHOCK SUPPRESSORS (SNUBBERS) (Cont'd)

Snubber No.	Location	Elevation
VR-H-61D	Drywell	
VR-H-62C	Drywell	899'
VR-H-63B	Drywell	897'
VR-H-63C	Drywell	898'
VR-55-9-Y	Drywell	919'
VR-55-9-Z	Drywell	919'
VR-55-23-X	Drywell	906'
VR-55-23-Y	Drywell	907'
VR-55-26-Z	Drywell	906'
VR-56-12-Y	Drywell	913'
VR-56-26-Y	Drywell	916'
VR-56-24-X	Drywell	907'
VR-56-24-Z	Drywell	910'
VR-57-12-Y	Drywell	922'
VR-58-12-Y	Drywell	924'
VR-59-7-X	Drywell	920'
VR-59-7-Z	Drywell	920'
VR-60-7-X	Drywell	920'
VR-60-7-Z	Drywell	920'
VR-61-8-X	Drywell	919'
VR-61-8-Y	Drywell	919'
VR-61-8-Z	Drywell	919'
VR-61-17-X	Drywell	915'
VR-61-17-Z	Drywell	915'
VR-62-8-X	Drywell	922'
VR-62-8-Y	Drywell	915'
VR-62-8-Z	Drywell	915'
VR-62-17-X	Drywell	915'
VR-62-17-Z	Drywell	915'
VR-S-14	Drywell	896'
VR-S-32	Drywell	897'
VR-S-43	Drywell	894'
VR-S-51	Drywell	896'
VR-S-87A	Drywell	894'
VR-S-87B	Drywell	894'
VR-S-88	Drywell	894'
VR-H-62B	Drywell	899'
VR-H-64D	Drywell	899'

BASES:

3.6.H and 4.6.H

Snubbers

Snubbers are designed to prevent unrestrained pipe 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 snubber is an increase in the probability of structural damage to piping as a result of a seismic or other event initiating dynamic loads. It is therefore required that all snubbers required to protect the primary coolant system or any other safety system or component be operable during reactor operation.

Because the snubber protection is required only during relatively low probability events, a period of 72 hours is allowed for repairs or replacement. In case a shutdown is required, the allowance of 36 hours to reach a cold shutdown condition will permit an orderly shutdown consistent with standard operating procedures. Since plant startup should not commence with knowingly defective safety related equipment, Specification 3.6.H.5 prohibits startup with inoperable snubbers.

All safety related snubbers are visually inspected for overall integrity and operability.

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%) 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 is clearly established and remedied for that snubber and for any other snubbers that may be generically susceptible, and/or verified by functional testing, 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 by visual inspection, or are similarly located or exposed to the same environmental conditions, such as temperature, radiation and vibration.

BASES (cont'd)

When a snubber is found inoperable, an engineering evaluation is performed, in addition to the determination of the snubber mode of failure, in order to determine if any safety related component or system has been adversely affected by the inoperability of the snubber. The engineering evaluation shall determine whether or not the snubber mode of failure has imparted a significant effect or degradation on the supported component or system.

In cases where the cause of failure has been identified, additional snubbers, having a high probability for the same type of failure or that are being used in the same application that caused the failure, shall be tested. This requirement increases the probability of locating inoperable snubbers without testing 100% of the snubbers.

Hydraulic snubbers and mechanical snubbers may each be treated as a different entity for the above surveillance programs.

To further increase the assurance of snubber reliability, functional tests should be performed once each refueling cycle. Ten percent of each type of snubber represents an adequate sample for such tests. Observed failures on these samples should require testing of additional units. Snubbers in high radiation areas or those especially difficult to remove need not be selected for functional tests provided operability was previously verified.

The service life of a snubber is evaluated via manufacturer input and information through consideration of the snubber service conditions and associated installation and maintenance records (newly installed snubber, seal replaced, spring replaced, in high radiation area, in high temperature area, etc. . .). The requirement to monitor the snubber service life is included to ensure that the snubbers periodically undergo a performance evaluation in view of their age and operating conditions. These records will provide statistical bases for future consideration of snubber service life. The requirements for the maintenance of records and the snubber service life review are not intended to affect plant operation.

6.6.2.G (cont'd)

usage evaluation per the ASME Boiler and Pressure Vessel Code Section III was performed[1] for the conditions defined in the design specification. The locations to be monitored shall be:

a. The feedwater nozzles

b. The shell at or near the waterline

c. The flange studs

2. Monitoring, Recording, Evaluating, and Reporting

a. Operational transients that occur during plant operations will, at least annually, be reviewed and compared to the transient conditions defined in the component stress report for the locations listed in 1 above, and used as a basis for the existing fatigue analysis.

b. The number of transients which are comparable to or more severe than the transient evaluated in the stress report Code fatigue usage calculations will be recorded in an operating log book. For those transients which are more severe, available data, such as the metal and fluid temperatures, pressures, flow rates, and other conditions will be recorded in the log book.

c. The number of transient events that exceed the design specification quantity and the number of transient events with a severity greater than that included in the existing Code fatigue usage calculations shall be added. When this sum exceeds the predicated number of design condition events by twenty-five[2], a fatigue usage evaluation of such events will be performed for the affected portion of the RCPB.

H. Records of individual plant staff members showing qualifications, training and retraining.

I. Records for Environmental Qualification which are covered under the provisions of paragraph 6.8.

J. Records of the service lives of all hydraulic and mechanical snubbers, listed on Tables 3.6.1, 3.6.2, 3.6.3 including the date at which the service life commences and associated installation and maintenance records.

6.6.3 Records and logs relating to the following items shall be kept for two years.

A. The test results, in units of microcuries, for leak tests of sources performed pursuant to Specification 3.8.A.

B. Records of annual physical inventories verifying accountability of the sources on record.

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1. See paragraph N-415.2, ASME Section III, 1965 Edition.

2. The Code rules permit exclusion of twenty-five (25) stress cycles from secondary stress and fatigue usage evaluation. (See paragraphs N-412(t)(3) and N-417.10(f) of the Summer 1968 Addenda to ASME Section III, 1968 Edition.)