

3.16 Shock Suppressors (Snubbers)

Applicability

Applies to the operability of the snubbers listed in Table 3.16.1

Objective

To identify those conditions for which the operability of snubbers is required and to identify the time limits in which either the snubbers must be made operable or reactor shutdown must occur.

Specification

- 3.16.1 During all modes of operation except Cold Shutdown and Refueling, all safety-related snubbers listed in Table 3.16.1 shall be operable except as noted in 3.16.2 through 3.16.4 below.
- 3.16.2 With one or more snubber(s) inoperable, within 72 hours replace or restore the inoperable snubber(s) to an OPERABLE status or perform an engineering evaluation on the supported component for the purpose of determining the effect on system operability or declare the supported system inoperable and follow the appropriate action statement for the system. In any case, an evaluation shall be performed in order to determine if any safety-related component or system has been adversely affected by the inoperability of the snubber.
- 3.16.3 If the requirements of 3.16.1 and 3.16.2 cannot be met, an orderly shutdown shall be initiated and the reactor shall be in cold shutdown condition within an additional 12 hours.
- 3.16.4 If a snubber is determined to be inoperable while the reactor is in the shutdown or refueling mode, the snubber shall be made operable or replaced prior to reactor start-up. Snubbers located on systems required to be operable in the shutdown or refueling mode shall be made operable or replaced during the succeeding 96 hours of cumulative continued system operation, or perform an engineering evaluation on the supported component for the purpose of determining the effect on system operability or declare the supported system inoperable and follow the appropriate action statement for the system.
- 3.16.5 Snubbers may be added to or deleted from safety-related systems without prior license amendment to Table 3.16-1 provided that a revision to Table 3.16.1 is included with the next License Amendment Request.

Bases

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 or other periods when severe transients might cause damaging dynamic loads. Because the snubber protection is required only during relatively low probability events, a period of 72 hours is allowed for repairs or replacements. In case a shutdown is required, the allowance of 12 hours to reach a cold shutdown condition will permit an orderly shutdown consistent with standard operating procedures. Since plant startup should not commence with safety equipment having known defects, Specification 3.16.4 prohibits startup with inoperable snubbers, but allows limited continuous operation of those systems required to be operable during shutdown and refueling condition.

Table 3.16.1 lists all snubbers installed on nuclear safety related systems throughout the plant. Snubbers were classified for the table in accordance with the following guidelines:

- a. High Radiation Area During Shutdown: those snubbers located in a general field of greater than 100 mr/hr. during shutdown.
- b. Especially difficult to remove: those snubbers that are elevated more than 10 feet off the floor and that, due to interferences, may not be safely reached from a suitable work platform.
- c. Inaccessible during normal operation: those snubbers that are located within an area where the general field is 100 mr/hr. or greater during normal operation.
- d. Accessible during normal operation: those snubbers that do not meet the criteria of paragraphs b and c above.

4.17 Shock Suppressors (Snubbers)

Applicability

Applies to the inspection of hydraulic snubbers listed in Table 3.16.1 to determine their operability.

Objective

To provide assurance of the operability of the hydraulic snubbers.

SURVEILLANCE REQUIREMENTS

4.17.1 Each snubber shall be demonstrated OPERABLE by performance of the following augmented inservice inspection program.

a. Visual Inspections

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

<u>No. Inoperable Snubbers per Inspection Period</u>	<u>Subsequent Visual Inspection Period</u>
0	18 months \pm 25%
1	12 months \pm 25%
2	6 months \pm 25%
3,4	124 days \pm 25%
5,6,7	62 days \pm 25%
8 or more	31 days \pm 25%

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

The snubbers may be categorized into two or more groups including those accessible and the inaccessible during reactor operation. Each group may be inspected independently in accordance with the above schedule.

b. Visual Inspection Acceptance Criteria

Visual inspections shall verify (1) that there are no visible indications of damage or impaired OPERABILITY, and (2) attachments to the foundation or supporting structure are secure. Snubbers which appear inoperable as a result of visual inspections (for example when the fluid port of a hydraulic snubber is found to be uncovered) 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 in the as found condition and determined OPERABLE per Specification 4.17.2.

4.17.2 Functional Tests

- a. Once each refueling cycle, a representative sample of ten percent (10%) of the hydraulic snubbers in use in the plant shall be functionally tested for operability including verification of proper piston movement, lockup and bleed. For each snubber that does not meet the functional test acceptance criteria of specification 4.17.2.b, an additional 10% shall be so tested until no more failures are found or all snubbers have been tested. Snubbers of rated capacity greater than 50,000 lbs. need not be functionally tested.

The representative sample selected for functional testing shall include the various configurations, operating environments and the range of size and capacity of snubbers. At least 15% of the snubbers in the representative sample shall include snubbers from the following two categories:

1. Snubbers within 5 feet of heavy equipment (valve, pump, turbine, motor, etc.)
2. Snubbers within 10 feet of the discharge from a safety relief valve.

Snubbers identified in Table 3.16.1 as "Especially Difficult to Remove" or in "High Radiation Zones During Shutdown" shall not be exempt from inclusion in the representative sample.

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 the spare snubber shall be tested and the failed snubber (if it is repaired and installed elsewhere) shall be retested. This testing requirement shall be independent of the requirements stated above for snubbers not meeting the functional test acceptance criteria.

If any snubber selected for functional testing either fails to lockup 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 subject to the same defect shall be functionally tested. This testing requirement shall be independent of the requirements stated above for snubbers not meeting the functional test acceptance criteria.

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

b. Hydraulic Snubbers Functional Test Acceptance Criteria

The hydraulic snubber functional test shall verify that:

1. Activation (restraining action) is achieved within the safe bounds of the piping analysis for the range of velocity in both tension and compression.
2. Snubber bleed rate, where required, is within the specified range in compression or tension.

4.17.3 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 for the duration of the snubber inservice life.

Concurrent with or prior to the next refueling cycle functional tests and at least once per 18 months thereafter, the installation and maintenance records for each snubber listed in Table 3.16.1 shall be reviewed to verify that the indicated service life has not been exceeded or will not be exceeded prior to the next schedule snubber service life review. If the indicated service life will be exceeded prior to the next schedule 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.

BASES

All snubbers are required OPERABLE to ensure that the structural integrity of the reactor coolant system and all other safety related systems is maintained during and following a seismic or other event initiating dynamic loads. Snubbers excluded from this inspection program are those installed on nonsafety-related systems.

The visual inspection frequency is based upon maintaining a constant level of snubber protection to systems. Therefore, the required inspection interval varies inversely with the observed snubber failures and is determined by the number of inoperable snubbers found during an 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 verified by inservice 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. For example, isolated hydraulic snubber seal failure as a result of normal in-service wear resulting in subsequent loss of snubber fluid and snubber inoperability is not considered to be generically applicable to all hydraulic snubbers. However, snubber seal failure which

is demonstrated to be the result of the degrading effects of the local environment would be applicable to similar snubbers in similar local environment.

When a snubber is found inoperable, an 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 evaluation shall determine whether or not the snubber mode of failure has imparted a significant effect or degradation on the supported component or system.

To provide assurance of snubber functional reliability, a representative sample of the installed snubbers will be functionally tested during plant shutdown once each refueling cycle. These tests will include stroking of the snubbers to verify proper piston movement, lock-up and bleed. Ten percent of the total snubbers installed represents an adequate sample for such tests. Observed failures on these samples could require testing of additional units.

Snubbers of rated capacity greater than 50,000 lbs. are exempt from the functional testing requirements because of the impracticality of testing such large units.

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.

Pages 4-64 through 4-71

INTENTIONALLY BLANK

6.10.2 (cont.)

- g. Records of training and qualification for current members of the plant staff.
- h. Records of in-service inspections performed pursuant to these Technical Specifications.
- i. Records of quality assurance activities required by the OQA Plan.
- j. Records of reviews performed for changes made to procedures or equipment or reviews of tests and experiments pursuant to 10 CFR 50.59.
- k. Plant Operations Review Committee and General Office Review Board Minutes.
- l. Records of the service lives of all hydraulic snubbers listed on Table 3.16.1 including the date at which the service life commences and associated installation and maintenance records.

6.11 RADIATION PROTECTION PROGRAM

Procedures for personnel radiation protection shall be prepared consistent with the requirements of 10 CFR Part 20 and shall be approved, maintained and adhered to for all operations involving personnel radiation exposure.

6.12 DELETED