

PLANT SYSTEMS

3/4.7.7 SNUBBERS

LIMITING CONDITION FOR OPERATION

3.7.7 All safety-related snubbers shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3 and 4. (MODES 5 and 6 for snubbers located on systems required OPERABLE in those MODES).

ACTION:

- a. With one or more snubbers inoperable: 1. within 72 hours replace or restore the inoperable snubber(s) to OPERABLE status, or 2. verify system operability with the snubber(s) inoperable by engineering evaluation within 72 hours; or 3. declare the supported subsystem inoperable and follow the appropriate ACTION statement for that system.

and, for snubbers which have failed either the visual or functional test:

- b. Perform an engineering evaluation within 90 days to determine if any safety-related system or component has been adversely affected by the inoperability of the snubber and if the snubber mode of failure has imparted a significant effect or degradation on the supported component or system.¹ The provisions of Technical Specification 3.0.4 are not applicable for the component or system.

SURVEILLANCE REQUIREMENTS

4.7.7 Each snubber² shall be demonstrated OPERABLE by the requirements of the following surveillance programs and pursuant to requirements of Specification 4.0.5.

4.7.7.1 Visual Inspection Program

¹Engineering evaluation is not required when a snubber is removed for surveillance testing provided it is returned to OPERABLE status within the requirements of ~~action~~ statement a.

ACTION

²Safety-related snubbers are listed in the latest revision of applicable surveillance test procedure(s). Snubbers may be added to, or removed from, safety-related systems and their assigned groups without a License Amendment.

SURVEILLANCE REQUIREMENTS (Continued)

Each of the groups may be inspected independently according to the schedule determined by Table 4.7-5. The visual inspection interval for each snubber group shall be determined based upon the criteria provided in Table 4.7-5, and the first inspection interval determined using the criteria shall be based upon the previous inspection interval as established by the requirements in effect before an amendment is made.

General Requirements

At least once per inspection interval, each group of snubbers in use in the Plant shall be visually inspected in accordance with Specification 4.7.7.1.b and 4.7.7.1.c. Visual inspections may be performed with binoculars, or other visual support devices, for those snubbers that are difficult to access and where required to keep exposure as low as reasonably achievable. Response to failures shall be in accordance with Specification 4.7.7.1.d.

Inspection Interval

The inspection interval ~~and sample exposure~~ may be applied on the basis of snubber groups. The snubber groups may be established based on physical characteristics and accessibility. Inaccessible snubbers are defined as those located: (a) inside containment, (b) in high radiation exposure zones, or (c) in areas where accessibility is limited by physical constraints such as the need for scaffolding.

~~The visual inspection interval for each group shall be performed in accordance with the following table:~~

NRC will include the number of the License Amendment that implements this change

Number of Inoperable Snubbers within a Group Per Inspection Interval

Subsequent Group Visual Inspection Interval

0	36 months
1	12 months
2	6 months
3, 4	24 days
5, 6, 7	62 days
8 or more	31 days

~~The inspection for a group shall include 100 percent of snubbers in that group.~~

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

~~The provisions of Specification 4.7.2 are not applicable.~~

~~All the time intervals are 25% except that the inspection of inaccessible snubbers may be deferred to the next shutdown when plant conditions allow 5 days for inspection.~~

TABLE 4.7-5
 SNUBBER VISUAL INSPECTION INTERVAL

Population or Group (Notes 1 and 2)	NUMBER OF UNACCEPTABLE SNUBBERS		
	Column A Extended Interval (Notes 3 and 6)	Column B Repeat Interval (Notes 4 and 6)	Column C Reduced Interval (Notes 5 and 6)
1	0	0	1
80	0	0	2
100	0	1	4
150	0	3	8
200	2	5	13
300	5	12	25
400	8	18	36
500	12	24	48
750	20	40	78
1000 or greater	29	56	109

Note 1: The next visual inspection interval for a snubber population or group size shall be determined based upon the previous inspection interval and the number of unacceptable snubbers found during that interval. Snubbers may be grouped, based upon their accessibility during power operation, as accessible or inaccessible. These categories may be examined separately or jointly. However, the licensee must make and document that decision before any inspection and shall use that decision as the basis upon which to determine the next inspection interval for that group.

Note 2: Interpolation between population or group sizes and the number of unacceptable snubbers is permissible. Use next lower integer for the value of the limit for Columns A, B, or C if that integer includes a fractional value of unacceptable snubbers as determined by interpolation.

Note 3: If the number of unacceptable snubbers is equal to or less than the number in Column A, the next inspection interval may be twice the previous interval but not greater than 48 months.

Note 4: If the number of unacceptable snubbers is equal to or less than the number in Column B but greater than the number in Column A, the next inspection interval shall be the same as the previous interval.

- Note 5: If the number of unacceptable snubbers is equal to or greater than the number in Column C, the next inspection interval shall be two-thirds of the previous interval. However, if the number of unacceptable snubbers is less than the number in Column C but greater than the number in Column B, the next interval shall be reduced proportionally by interpolation, that is, the previous interval shall be reduced by a factor that is one-third of the ratio of the difference between the number of unacceptable snubbers found during the previous interval and the number in Column B to the difference in the numbers in Columns B and C.
- Note 6: The provisions of Specification 4.0.2 are applicable for all inspection intervals up to and including 48 months, with the exception that inspection of inaccessible snubbers may be deferred to the next shutdown when plant conditions allow five days for inspection.

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SURVEILLANCE REQUIREMENTS (Continued)

c. Acceptance Criteria

A snubber shall be considered OPERABLE as a result of a visual inspection if: (1) there are no visible indications of damage or inoperability, and (2) attachments to the foundation or supporting structure are secure.

d. Response to Failures

For each snubber unit which does not meet the visual inspection acceptance criteria of Specification 4.7.7.1.c:

Determine the snubber OPERABLE by functionally testing the snubber per Specification 4.7.7.2, unless the (hydraulic) snubber was determined inoperable because the fluid port was found uncovered;

OR

1. Perform the ACTION specified in 3.7.7a; and

2. Perform an engineering evaluation as specified in 3.7.7.b.; and

3. ^{Establish} ~~the frequency of group inspection~~ the frequency of group inspection as described in Specification 4.7.7.1.b. ^{IF} ~~the cause of the rejection is clearly established and remedied for that particular snubber and for other snubbers that may be generically susceptible,~~ the snubber need not be considered unacceptable for purposes of establishing the next visual inspection interval.

e. Transient Event Inspection

An inspection shall be performed of all hydraulic and mechanical snubbers attached to sections of systems that have experienced unexpected, potentially damaging transients as determined from a review of operational data. A visual inspection of the snubbers on these systems shall be performed within six months following such an event. In addition to satisfying the visual inspection acceptance criteria, freedom-of-motion of mechanical snubbers shall be verified using at least one of the following: (1) manually induced snubber movement; or (2) evaluation of in-place snubber piston setting; or (3) stroking the mechanical snubber through its full range of travel.

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SURVEILLANCE REQUIREMENTS (Continued)

4.7.7.2 Functional Test Program

a. General Requirements

At least once per inspection interval a representative sample of each group of snubbers in use in the Plant shall be functionally tested in accordance with Specifications 4.7.7.2.b and 4.7.7.2.c. Response to the failures shall be in accordance with Specification 4.7.7.2.d.

For all snubbers, functional testing shall consist of either bench testing or in-place testing.

b. Inspection Interval and Sample Criteria

The snubbers may be categorized into groups based on physical characteristics: ^{and accessibility} ~~Snubbers are divided into four~~ ~~(4) groups: "Accessible" Group I and "Inaccessible" Group II for either hydraulic or mechanical.~~ Each group may be tested independently from the standpoint of performing additional tests if failures are discovered.

~~* For Cycle 6 operation, Specification 4.0.2.b is not applicable. The next functional test is 18 months after September 14, 1988 (i.e., March 14, 1990). The allowance of Specification 4.0.2.a is applicable (i.e., July 31, 1990).~~

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SURVEILLANCE REQUIREMENTS (Continued)

The inspection interval for functional testing shall be 18 months.

Snubbers which are scheduled for removal for seal maintenance may be included in the test sample prior to any maintenance on the snubber.

The representative sample shall consist of at least 10 percent (rounded off to next highest integer) of each group of snubbers in use in the Plant. The selection process shall ensure that all snubbers, regardless of their accessibility classification, are functionally tested at least once every ten inspection intervals.

c. Acceptance Criteria

For hydraulic snubbers (either in-place testing or bench testing), the test shall verify that:

1. Snubber piston will allow the hydraulic fluid to "bypass" from one side of the piston to the other to assure unrestrained action is achieved within the specified range of velocity or acceleration in both tension and compression.
2. When the snubber is subjected to a movement which creates a load condition that exceeds the specified range of velocity or acceleration, the hydraulic fluid is trapped in one end of the snubber causing suppression of that movement.
3. Snubber release rate or bleed rate, where required, occurs in compression and tension.

For mechanical snubber in place and bench testing, the 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 in both tension and compression within the specified range.

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SURVEILLANCE REQUIREMENTS (Continued)

d. Response to Failures

For each inoperable snubber per Specification 4.7.7.2.c:

1. Perform the ACTIONS specified in 3.7.7a and 3.7.7b; and
2. Within the specified inspection interval, functionally test an additional sample of at least 10 percent of the snubber units from the group that the inoperable snubber unit is in.

The functional testing of an additional sample of at least 10 percent from the inoperable snubber's group is required for each snubber unit determined to be inoperable in subsequent functional tests, or until all snubbers in that group have been tested; and

3. The cause of snubber failure will be evaluated and, if caused by a manufacturing or design deficiency, all snubbers of the same or similar design subject to the same defect shall be functionally tested within 90 days from determining snubber inoperability. This testing requirement shall be independent of the requirements in 4.7.7.2.d(2) above.

BASES

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~~intended~~
All safety-related 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 dynamic event. Snubbers excluded from this inspection program are those installed on safety-related systems for loads other than dynamic or on nonsafety-related, and then only if their failure or failure of the system on which they are installed, would have no adverse effect on any safety-related system during a dynamic event.

Inoperable is defined as:

1. For visual test
 - a. The fluid no longer is supplied to the valve block, or
 - b. Mounting pins are disengaged from the snubber.
 - c. Attachment to foundation or supporting structure is not secure.
2. For functional test
 - a. The snubber (excluding end anchors, i.e., pin-to-pin) does not meet specified test criteria.

the total population or group size for each snubber type, and the previous inspection interval.
The visual inspection frequency is based upon maintaining a constant level of snubber protection to systems. Therefore, the required inspection interval ~~is determined by the number of inoperable snubbers found during an inspection, and 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 required interval has elapsed (noted in sec 257) may not be used to shorten 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 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 or~~ similar 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.

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BASES

When a snubber is found inoperable through a visual or functional test, 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.

To provide assurance of snubber functional reliability, a representative sample of the installed snubbers will be functionally tested at 18-month intervals. Observed failures of these sample snubbers shall require functional testing of additional units. When a snubber is found to be inoperable due to failure to lock up or failure to move (i.e., frozen in place), the cause will be evaluated for further action or testing.

In cases where the cause of failure has been identified, additional snubbers that have a high probability for the same type of failure or 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.