

PLANT SYSTEMS

3/4.7.7 SNUBBERS

LIMITING CONDITION FOR OPERATION

3.7.7 All snubbers on systems required for safe shutdown/accident mitigation shall be OPERABLE. This includes safety and non-safety related snubbers on systems used to protect the code boundary and to ensure the structural integrity of these systems under dynamic loads.

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

ACTION:

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 4.7.7.g on the attached component or declare the attached system inoperable and follow the appropriate ACTION statement for that system.

SURVEILLANCE REQUIREMENTS

4.7.7 Each snubber shall be demonstrated OPERABLE by performance of the following augmented inservice inspection program and the requirements of Specification 4.0.5.

a. Inspection Types

As used in this specification, type of snubber shall mean snubbers of the same design and manufacturer, irrespective of capacity.

b. Visual Inspections

The first inservice visual inspection of each type of snubber shall be performed after 4 months but within 10 months of commencing POWER OPERATION and shall include all snubbers defined in Section 3.7.7. If less than two snubbers of each type are found inoperable during the first inservice visual inspection, the second inservice visual inspection shall be performed 12 months \pm 25% from the date of the first inspection. Otherwise, subsequent visual inspections shall be performed in accordance with the following schedule:

No. Inoperable Snubbers of each type per Inspection Period	Subsequent Visual Inspection Period [#]
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 inspection interval for each type of snubber shall not be lengthened more than one step at a time unless a generic problem has been identified and corrected; in that event the inspection interval may be lengthened one step the first time and two steps thereafter if no inoperable snubbers of that type are found.

#The provisions of Specification 4.0.2 are not applicable.

ADD INSERT 4.7.7b

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SURVEILLANCE REQUIREMENTS (Continued)

c. Refueling Outage Inspections

Each refueling outage

~~At least once per 18 months~~, an inspection shall be performed of all the snubbers defined in Section 3.7.7 attached to sections of safety systems piping that have experienced unexpected, potentially damaging transients as determined from a review of operational data and a visual inspection of the systems. 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: (i) manually induced snubber movement; (ii) evaluation of in-place snubber piston setting; or (iii) stroking the mechanical snubber through its full range of travel.

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 ~~may be determined~~ *are functional, and (3) fasteners for the attachment of the snubbers to the component and to the snubber anchorage are functional.* ~~OPERABLE~~ for the purpose of establishing the next visual inspection interval, provided that (a) the cause of the rejection is clearly established and remedied for that particular snubber and for other snubbers irrespective of type that may be generically susceptible; and (b) the affected snubber is functionally tested in the as found condition and determined OPERABLE per Specifications 4.7.7.f. When a fluid port of a hydraulic snubber is found to be uncovered the snubber shall be declared inoperable and shall not be determined OPERABLE via functional testing unless the test is started with the piston in the as found setting, extending the piston rod in the tension mode direction. All snubbers connected to an inoperable common hydraulic fluid reservoir shall be counted as ~~inoperable snubbers~~ *found*.

e. Functional Tests

Insert 4.7.7 d.

During the first refueling shutdown and at least once per 18 months thereafter during shutdown, a representative sample of either: (1) At least 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 of a type that does not meet the functional test acceptance criteria of Specification 4.7.7.f, an additional 10% of that type of snubber shall be functionally tested until no more failures are found or until all snubbers of that type have been functionally tested, or (2) A representative sample of each type of snubber shall be functionally tested in accordance with Figure 4.7-1, "C" is the total number of snubbers of a type found not meeting the acceptance requirements of Specification 4.7.7.f. The cumulative number of snubbers of a type tested is denoted by "N." At the end of each day's testing, the new values of "N" and "C" (previous day's total plus current day's increments) shall be plotted on Figure 4.7-1. ~~If at any time the point plotted falls in the "Reject" region all snubbers of that type shall be functionally tested.~~ If at any time the point plotted falls in

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SURVEILLANCE REQUIREMENTS (Continued)

e. Functional Tests (Continued)

the "Accept" region testing of that type of snubber may be terminated. When the point plotted lies in the "Continue Testing" region, additional snubbers of that type shall be tested until the point falls in the "Accept" region ~~on the "Reject" region~~, or all the snubbers of that type have been tested.

The representative sample selected for functional testing shall include the various configurations, operating environments, and the range of size and capacity of snubbers of each type. The representative sample shall be weighted to include more snubbers from severe service areas such as near heavy equipment. Snubbers placed in the same location as snubbers which failed the previous functional test shall be included in the next test lot if the failure analysis shows that failure was due to location.

f. Functional Test Acceptance Criteria

The snubber functional test shall verify that:

1. Activation (restraining action) is achieved within the specified range in both tension and compression, except that inertia dependent, acceleration limiting mechanical snubbers, may be tested to verify only that activation takes place in both directions of travel.
2. Snubber bleed, or release rate where required, is present in both tension and compression, within the specified range.
3. Where required, the force required to initiate or maintain motion of the snubber is within the specified range in both direction of travel.
4. For snubbers specifically required not to displace under continuous load, the ability of the snubber to withstand load without displacement.
5. Fasteners for attachment of the snubber to the component and to the snubber anchorage are secure.

Testing methods may be used to measure parameters indirectly or parameters other than those specified if those results can be correlated to the specified parameters through established methods.

g. Functional Test Failure Analysis

An engineering evaluation shall be made of each failure to meet the functional test acceptance criteria to determine the cause of the failure. The results of this evaluation shall be used, if applicable, in selecting snubbers to be tested in an effort to determine the OPERABILITY of other snubbers irrespective of type which may be subject to the same failure mode.

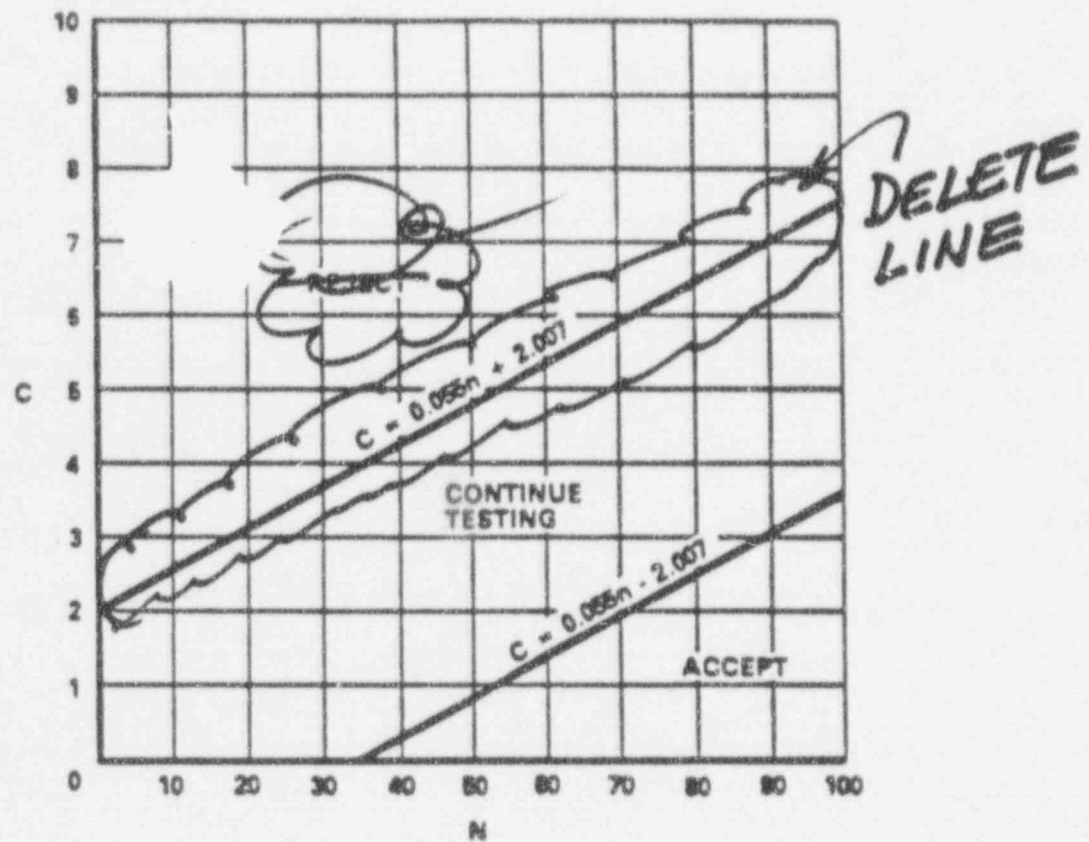


FIGURE 4.7-1 SAMPLING PLAN FOR SUNBBER FUNCTIONAL TEST

TABLE 4.7-2
SNUBBER VISUAL INSPECTION INTERVAL

Population or Category (Notes 1 and 2)	NUMBER OF UNACCEPTABLE SNUBBERS		
	Column A Extend Interval (Notes 3 and 6)	Column B Repeat Interval (Notes 4 and 6)	Column C Reduce 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

TABLE NOTATION

- (1) The next visual inspection interval for a snubber population or category size shall be determined based upon the previous inspection interval and the number of unacceptable snubbers found during that interval. Snubbers may be categorized, 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 category.
- (2) Interpolation between population or category 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 includes a fractional value of unacceptable snubbers as determined by interpolation.
- (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.
- (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.

SNUBBERS

TABLE 4.7-2 (CONTINUED)

TABLE NOTATION

- (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.
- (6) The provisions of Specification 4.0.2 are applicable for all inspection intervals up to and including 48 months.

PLANT SYSTEMS

BASES

ULTIMATE HEAT SINK (Continued)

The limitations on minimum water level and maximum temperature are based on providing a 30 day cooling water supply to safety related equipment without exceeding their design basis temperature and is consistent with the recommendations of Regulatory Guide 1.27, "Ultimate Heat Sink for Nuclear Plants", March 1974.

3/4.7.6 CONTROL ROOM NORMAL AND EMERGENCY AIR HANDLING SYSTEM

The OPERABILITY of the control room ventilation system ensures that 1) the ambient air temperature does not exceed the allowable temperature for continuous duty rating for the equipment and instrumentation cooled by this system and 2) the control room will remain habitable for operations personnel during and following all credible accident conditions. The OPERABILITY of this system in conjunction with control room design provisions is based on limiting the radiation exposure to personnel occupying the control room to 5 rem or less whole body, or its equivalent. This limitation is consistent with the requirements of General Design Criteria 19 of Appendix "A", 10 CFR 50.

3/4.7.7 SNUBBERS

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Snubbers are classified and grouped by design and manufacturer but not by size. For example, mechanical snubber utilizing the same design features of the 2 kip, 10 kip and 100 kip capacity manufactured by company "A" are of the same type. The same design mechanical snubber manufactured by company "B" for the purposes of this specification would be of a different type, as would hydraulic snubbers from either manufacturer.

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.

Table 4.7-2 establishes Three limits for determining the next Visual inspection interval.

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BASES

SNUBBERS (Continued)

To provide assurance of snubber functional reliability one of two sampling and acceptance criteria methods are used:

- 1) functionally test 10 percent of a type of snubber with an additional 10 percent tested for each functional testing failure, or
- 2) functionally test a sample size and determine sample acceptance ~~or~~
~~rejection~~ using Figure 4.7-1.

Figure 4.7-1 was developed using "Wald's Sequential Probability Ratio Plan" as described in "Quality Control and Industrial Statistics" by Acheson J. Duncan.

The service life of a snubber is established 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.

Permanent or other exemptions from the surveillance program 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 the snubber for the applicable design conditions at either the completion of their fabrication or at a subsequent date. Snubbers so exempted shall be listed in Section 3.7.7 with footnotes indicating the extent of the exemptions.

PROPOSED TECHNICAL SPECIFICATION CHANGE - TSP 910003-1
VIRGIL C. SUMMER NUCLEAR STATION
DESCRIPTION AND SAFETY EVALUATION

DESCRIPTION OF CHANGE

SCE&G proposes to modify the Virgil C. Summer Nuclear Station Technical Specifications (TS) to revise TS 4.7.7 and associated Bases 3/4.7.7 in accordance with GL 90-09; additionally, the REJECT line in figure 4.7-1 and all references to this line are deleted from the text. The proposed amendment changes the snubber visual inspection schedule of surveillance requirement 4.7.7 to the alternate visual inspection schedule specified by GL 90-09, and changes the associated Bases 3/4.7.7.

SAFETY EVALUATION

Snubbers are designed to prevent unrestrained motion of piping systems and components under dynamic loading, while allowing normal thermal expansion and contractions to occur during plant startup, operation, and shutdown. The proposed changes do not involve any change to the plant configuration or its mode of operation as described in the safety analysis report. Existing safety analyses and safety assumptions are not affected nor need to be changed. All snubbers and related components will continue to be visually and functionally inspected; therefore, their operability will not be affected. Deletion of the Reject line from figure 4.7-1 and its references in the text are needed to reflect actual testing strategy. The use of the Reject line is incorrect since this line assumes a totally homogeneous sample and that the failures of the total population are in the same ratio as the failures in the selected sample.

PROPOSED TECHNICAL SPECIFICATION CHANGE - TSP 910003-1
VIRGIL C. SUMMER NUCLEAR STATION

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATION

DESCRIPTION OF CHANGE

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SIGNIFICANT HAZARDS EVALUATION

SCE&G has evaluated the proposed technical specification change and has determined that it does not represent a significant hazard consideration based on the criteria established in 10 CFR 50.92. Operation of Virgil C. Summer Nuclear Station in accordance with the proposed amendment will not:

- (1) involve a significant increase in the probability or consequences of an accident previously evaluated.

The proposed change will allow extension of subsequent visual surveillance intervals based on the number of unacceptable snubbers found during the previous inspection, in accordance with the guidance contained in GL 90-09. This change will not involve any change to the actual surveillance requirements. There will be no increase in the probability of failure of components and systems that would result from extending the visual surveillance interval. Reliability is ensured by functional testing which provides a 95 percent confidence level that 90 to 100 percent of the snubbers will operate within their specified acceptance limit.

The Reject line, developed using Wald's Sequential Probability Ratio Plan, assumes that the sample is totally homogeneous, and that the failure in the total population is in the same ratio as the failures observed in a given sample. This is not correct when functionally testing snubbers in nuclear power stations. Snubbers can not be considered a homogeneous population, since the sampling for functional testing includes various configurations, different environmental conditions, different sizes, capacities and types of snubbers, and the sample is weighted to include more snubbers from severe service areas.

- (2) create the possibility of a new or different kind of accident from any previously analyzed.

The proposed change will not make physical alterations to any plant system, structure or component, will not change the method by which a safety-related system performs its function, and will not change the way the surveillance requirement is performed. The proposed change will only allow extension of a subsequent snubber visual inspection if the number of unacceptable snubbers found during a given inspection is equal or less than the number of unacceptable snubbers given in the new SNUBBER VISUAL INSPECTION INTERVAL table. Deletion of the Reject line from Figure 4.7-1 does not contribute to any new or different kind of accident.

- (3) involve a significant reduction in a margin of safety.

The proposed change will not alter existing surveillance requirements; therefore, the reliability, ensured through functional testing, will not be degraded. Visual examinations complement the functional testing of snubbers and provide additional confidence of snubber reliability. VCSNS operating experience indicates that existing maintenance programs are effective in minimizing snubber failures, as demonstrated by the low snubber failure rate experienced. During VCSNS' most recent inspection, eight snubbers were found unacceptable by visual inspection out of a total population of 1127 TS snubbers. These unacceptable snubbers were subsequently tested, root cause analyses were performed, corrective actions were taken, and were later declared acceptable.

Deletion of the Reject line in Figure 4.7-1 does not contribute to any reduction in the margin of safety.