

ATTACHMENT 1
SURRY POWER STATION
PROPOSED TECHNICAL SPECIFICATION CHANGES
MECHANICAL SNUBBERS FUNCTIONAL TESTING
ACCEPTANCE CRITERIA

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4.17 SHOCK SUPPRESSORS (SNUBBERS)

Applicability

Applies to all hydraulic and mechanical shock suppressors (snubbers) which are required to protect the Reactor Coolant System and other safety-related systems. Snubbers excluded from this inspection are those installed on non-safety-related systems 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.

Objective

To specify the minimum frequency and type of surveillance to be applied to the hydraulic and mechanical snubbers required to protect the Reactor Coolant System and other safety-related systems.

Specification

Each snubber shall be demonstrated OPERABLE by performing the following augmented inservice inspection program and the requirements of Specification 4.0.3. As used in this specification, "type of snubber" shall mean snubbers of the same design and manufacturer, irrespective of capacity.

A. Visual Inspections

1. Snubbers are categorized as inaccessible or accessible during reactor operation. Each of these categories (inaccessible and accessible) may be inspected independently according to the schedule determined by Table 4.17-1. The visual inspection interval of each category of snubber shall be determined based upon the criteria provided in Table 4.17-1.

4. A review and evaluation shall be performed and documented to justify continued operation with an unacceptable snubber. If continued operation cannot be justified, the snubber shall be declared inoperable and the action requirements of Specification 3.20 shall be met.

C. Functional Tests

1. At least once per 18 months during shutdown, a representative sample of 10% of the total of each type of snubber used in the plant shall be functionally tested using either an in-place test machine or a bench test.
2. The representative sample selected for functional testing shall include the various configurations, operating environments and the range of size and capacity of snubbers. This representative sample shall not, to the extent practicable, include those snubbers tested in a previous representative sample.
3. At least 25% of the snubbers in the representative sample shall include snubbers from the following three categories:
 - a. the first snubber away from each reactor vessel nozzle,
 - b. snubbers within 5 feet of heavy equipment (valve, pump, turbine, motor, etc), and
 - c. snubbers within 10 feet of the discharge from a safety relief valve.

4. Snubbers identified as "Especially Difficult to Remove" or in "High Radiation Zone During Shutdown" shall also be included in the representative sample.*
5. 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 resampling.
6. For each snubber that does not meet the functional acceptance criteria of Specification 4.17.D or 4.17.E, an additional 10% of that type of snubber shall be functionally tested.
7. For snubbers of 50 kips and above that are extremely difficult to remove or in high radiation zones that fail the functional testing, an engineering evaluation is required to determine the failure mode. If the failure is determined to be non-generic, an additional 10% of that type will be tested during the next functional test period.
8. 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.

* Permanent or other exemptions from functional testing for individual snubbers in these categories may be granted by the Commission only if a justifiable basis for exemption is presented and/or snubber life destructive testing was performed to qualify snubber operability for all design conditions at either the completion of their fabrication or at a subsequent date.

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

D. Hydraulic Snubbers Functional Test Acceptance Criteria

1. The hydraulic snubber functional test shall verify that:
 - a. Activation (restraining action) is achieved within the specified range of velocity or acceleration in both tension and compression.
 - b. Snubber bleed, or release rate, where required, is within the specified range in compression and tension. For snubbers specifically required to not displace under continuous load, the ability of the snubber to withstand load without displacement shall be verified.

E. Mechanical Snubbers Functional Test Acceptance Criteria

1. The mechanical snubbers functional test shall verify that:
 - a. The drag force of the snubber in both tension and compression is less than the specified maximum drag force.
 - b. Activation (restraining action) is achieved within the specified range of velocity in both tension and compression.

To provide assurance of snubber functional reliability, a representative sample of the installed snubbers will be functionally tested during plant shutdowns at 18 month intervals. Functional testing is to be in accordance with the ASME Section XI Inservice Inspection program approved by the NRC. Observed failures of these sample snubbers shall require functional testing of additional units.

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

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.

ATTACHMENT 2
SURRY POWER STATION
MECHANICAL SNUBBERS FUNCTIONAL TESTING
ACCEPTANCE CRITERIA
DISCUSSION OF CHANGES AND
SIGNIFICANT HAZARDS CONSIDERATION DETERMINATION

DISCUSSION OF CHANGES

INTRODUCTION

Surry Power Station has both hydraulic and mechanical snubbers installed in the plant. Technical Specifications require periodic functional testing of both hydraulic and mechanical snubbers. Acceptance criteria for functional testing of snubbers are included in the Technical Specifications. Over the last several refueling outages the originally installed Pacific Scientific mechanical snubbers have been replaced with Anchor Darling mechanical snubbers. Since the Anchor Darling snubbers operate in a different manner, the existing Technical Specification acceptance criteria for functional testing of mechanical snubbers are inappropriate for operability determinations. Therefore, changes are being proposed to the mechanical snubber functional testing acceptance criteria to provide appropriate acceptance criteria for the Anchor Darling snubbers. In addition, other administrative changes are being proposed to provide consistency in terminology and to note that functional testing is in accordance with the approved Inservice Inspection Program.

BACKGROUND

The existing acceptance criteria for functional testing (Technical Specification 4.17.E) require that: 1) the force that initiates free movement of the snubber rod in either tension or compression is less than the maximum drag force, and 2) the drag force shall not have increased by more than 50% since the last functional test. The originally installed Pacific Scientific mechanical snubber was an acceleration limiting device that utilized a mass inside the snubber to limit acceleration during sudden movements or seismic disturbances. The breakaway drag force (the force that initiates free movement) was measured for the Pacific Scientific mechanical snubbers to demonstrate free movement. The Anchor Darling DynaDamp snubber is a velocity limiting device that utilizes an oscillatory type escapement mechanism to restrict pipe movement at a constant velocity. The snubber is always engaged and resists movement proportional to velocity. Thus, there is no "free movement." Consequently, the drag force that is required to maintain the snubber movement at a constant velocity is a more meaningful measure of the snubber's ability to move with the piping without imposing undue restraint. Secondly, due to the difference in the functional

mechanisms of their snubbers, a 50% relative increase in drag force is not a meaningful criterion for determining operability of Anchor Darling snubbers. Based on discussions with the manufacturer and separate discussions with the Chairman of ASME ISTD Committee for snubbers, there is no basis for establishing a surveillance requirement based on 50% relative increase in drag force as an indication of impending snubber failure. Since the measured drag force can be highly variable from test to test, a 50% relative increase in measured drag force may only be indicative of measurement or test uncertainty. The absolute value of the drag force, as compared to a specified maximum acceptable value, is a much better indicator of snubber performance.

Technical Specification 4.17.C.6 requires that for each snubber which fails to meet the functional test acceptance criteria of Technical Specification 4.17.E, an additional 10% of that type of snubber be functionally tested. During the recent Unit 1 refueling outage, the measured drag force of three Anchor Darling mechanical snubbers exceeded their previous measured drag force by greater than 50%, although the absolute values were below the specified maximum value. Because a maximum 50% increase in drag force is not an appropriate acceptance criterion for the currently installed Anchor Darling mechanical snubbers, a temporary waiver of compliance from the additional testing requirement of Technical Specification 4.17.C.6 was requested and granted on April 24, 1992. Acceptance of snubber operability was based on the absolute value of drag force as compared to the specified maximum value.

SPECIFIC CHANGES

The following Technical Specification changes are being proposed to Technical Specification 4.17:

- Change the word "type" to "category" in Technical Specification 4.17.A.1 for consistent terminology.
- Change the word "category" to "type" in Technical Specification 4.17.C.7 for consistent terminology.

- Modify the mechanical snubber functional testing acceptance criterion in Technical Specification 4.17.E. to require that "the drag force in both tension and compression is less than the specified maximum drag force."
- Clarify the Basis to identify that functional testing is performed in accordance with the approved Inservice Inspection Program rather than the general reference to the ASME Code.
- Modifying the wording of Technical Specification 4.17.C.1 to be more definitive.
- Capitalize defined words and system names.

SAFETY SIGNIFICANCE

These proposed Technical Specification changes modify the acceptance criteria for functional testing of mechanical snubbers consistent with the design of the installed snubbers. The new acceptance criteria adequately demonstrate the operability of the tested snubbers. Therefore, the probability of an accident and the consequences of previously analyzed accidents remain unchanged. Modifying the functional test requirements and acceptance criteria for snubbers does not impact plant operation in any way. The snubbers and the systems supported by these snubbers are not being operated in a different manner. Thus, new accident precursors are not being generated. The proposed Technical Specification changes do not change any accident assumptions or modify system structure or component operability requirements. Therefore, the safety margin as defined in Technical Specifications is not reduced.

SIGNIFICANT HAZARDS CONSIDERATION

Virginia Electric and Power Company has reviewed the proposed changes against the criteria of 10 CFR 50.92 and has concluded that the changes as proposed do not pose a significant hazards consideration. Specifically, operation of the Surry Power Station in accordance with the proposed changes will not:

1. Involve a significant increase in the probability of occurrence or consequences of an accident previously evaluated.

Mechanical snubbers will continue to be functionally tested and the results evaluated against appropriate criteria to ensure operability. The operability of the systems supported by the snubbers is not being affected. Functional testing of snubbers will continue to be performed once every eighteen months when the plant is shutdown. Therefore, the probability of occurrence or the consequences of an accident previously evaluated is not being significantly increased by the proposed changes.

2. Create the possibility of a new or different kind of accident from any accident previously evaluated.

The systems, structures, and components supported by these snubbers will not be operated in a different manner. The modified snubber functional test acceptance criteria will ensure snubber operability. Therefore, the proposed changes do not introduce any new failure modes or accident precursors.

3. Involve a significant reduction in a margin of safety.

The proposed changes will continue to ensure the operability of the mechanical snubbers. The systems, structures and components will not be effected by the proposed changes and will continue to perform as assumed in the accident analyses. Therefore, the margin of safety as defined in any Technical Specification is not significantly reduced.