

INSERT 1

**LCO 3.0.8** When one or more required snubbers or other seismic restraints are unable to perform their associated support function(s), any affected supported LCO(s) are not required to be declared not met solely for this reason for up to 72 hours if risk is assessed and managed, and:

- a. the snubbers and other seismic restraints not able to perform their associated support function(s) are associated with only one train or subsystem of a multiple train or subsystem supported system or is associated with a single train or subsystem supported system; [or
- b. there is only a single snubber or other seismic restraint not able to perform its associated support function(s) and that by design the snubber or other seismic restraint affects multiple trains or subsystems of a multiple train or subsystem supported system.

**The provisions of LCO 3.0.8.a and LCO 3.0.8.b shall not be used concurrently.]**

At the end of this 72 hours, the required snubbers or other seismic restraints must be able to perform their associated support function(s), or the affected supported LCO(s) shall be declared not met.

INSERT 2

**LCO 3.0.8** LCO 3.0.8 establishes that systems are considered to remain capable of performing their intended safety function when the only issue associated with the system is that snubbers or other seismic restraints are not capable of providing their associated support function(s). A time limit of 72 hours is placed on each use of this allowance to ensure that as snubbers or other seismic restraints are removed or otherwise made unavailable, they are promptly restored. This LCO states that the supported system is not considered to be inoperable solely due to one or more snubbers or other seismic restraints not capable of performing their associated support function(s). This is appropriate because design basis accidents and transients are not assumed to occur concurrent with a seismic event. Also, appropriate actions to ensure the unit is maintained in a safe condition are specified in the snubber and seismic restraint requirements, which are located outside of the Technical Specifications (TS) under licensee control. The snubber and other seismic restraint requirements do not meet the criteria in 10 CFR 50.36(c)(2)(ii), and, as such, are appropriate for control by the licensee.

When one or more snubbers or other seismic restraints are not capable of providing their support function of one or more supported system's LCO(s), time is provided to allow necessary maintenance, testing, or repair. Other compensatory actions may also be required. If the 72 hours expires and the snubber(s) or other seismic restraint(s) are unable to perform their associated support function(s), the affected supported system's LCO must be declared not met and their Conditions and Required Actions entered in accordance with LCO 3.0.2.

LCO 3.0.8 will only be applied when one or more snubbers or other seismic restraints are not capable of providing their associated support function(s) to a single train or subsystem of a multiple train or subsystem supported system or to a single train or subsystem in a single train or subsystem supported system. LCO 3.0.8 may not be used to remove one or more snubbers or other seismic restraints when more than one train or subsystem of a multiple train or subsystem supported system is affected [, except for those snubbers and other seismic restraints that by design support more than one train or subsystem of a multiple train or subsystem supported system. LCO 3.0.8.b may be applied to the following snubbers or other seismic restraints when these snubbers and other seismic restraints are not capable of providing their associated support function to the listed multiple train or subsystem supported systems in the listed MODES or other specified conditions in the Applicability provided plant risk is assessed and managed.

<u>Snubber or Other Seismic Restraint Description</u>	<u>Supported System</u>	<u>Applicable MODE or Other Condition Specified in the Applicability</u>
1-RHR-123	RHR	1, 2, 3, 4

----- Reviewer's Note -----

Adoption of LCO 3.0.8 requires a plant-specific risk evaluation of those snubbers that, by design, support more than one train of a multiple train supported system. The plant-specific risk evaluation must demonstrate the acceptability of removing the snubbers in the applicable MODE or other specified condition in the Applicability and should demonstrate that the associated plant risk falls within the "normal work controls" range of Section 11 of NUMARC 93-01.

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Industry and NRC guidance on the implementation of 10 CFR 50.65(a)(4) (the Maintenance Rule) does not address seismic risk. However, use of LCO 3.0.8 should be considered with respect to other plant maintenance activities, and integrated into the existing (a)(4) process to ensure that maintenance on the any unaffected train or subsystem is properly controlled, and emergent issues are properly addressed.

## **1.0 DESCRIPTION**

The proposed change would add a new LCO 3.0.8 to Section 3.0, LCO and SR Applicability, of the improved Standard Technical Specifications (ISTS) to allow a delay time for snubbers or other seismic restraints which cannot perform their required support function, before the supported systems are declared inoperable.

## **2.0 PROPOSED CHANGE**

The proposed change will add a new LCO to Section 3.0, LCO and SR Applicability, of the ISTS. This new LCO, LCO 3.0.8, states:

When one or more required snubbers or other seismic restraints are unable to perform their associated support function(s), any affected supported LCO(s) are not required to be declared not met solely for this reason for up to 72 hours if risk is assessed and managed, and:

- a. the snubbers and other seismic restraints not able to perform their associated support function(s) are associated with only one train or subsystem of a multiple train or subsystem supported system or is associated with a single train or subsystem supported system [; or
- b. there is only a single snubber or other seismic restraint not able to perform its associated support function(s) and that by design the snubber or other seismic restraint affects multiple trains or subsystems of a multiple train or subsystem supported system.

**The provisions of LCO 3.0.8.a and LCO 3.0.8.b shall not be used concurrently.]**

At the end of this 72 hours, the required snubbers or other seismic restraints must be able to perform their associated support function(s), or the affected supported LCO(s) shall be declared not met.

Bases describing the new LCO 3.0.8 are also added.

## **3.0 BACKGROUND**

Component standard supports are those metal supports which are designed to transmit loads from the pressure-retaining boundary of the component to the building structure. Although classified as component standard supports, snubbers require special consideration due to their unique function. Snubbers are designed to provide no transmission of force during normal plant operations, but function as a rigid support when subjected to dynamic transient loadings. Therefore, snubbers are chosen in lieu of rigid supports where restricting thermal growth during normal operation would induce excessive stresses in the piping nozzles or other equipment. The location and size of the snubbers are determined by stress analysis. Depending on the design classification of the particular piping, different combinations of load conditions are established. These conditions combine loading during normal operation, seismic loading and loading due to plant accidents and transients to four different loading sets. These loading sets are designated as: normal, upset, emergency, and faulted condition. The actual loading included in each of the four conditions, depends on the design classification of the piping. The

calculated stresses in the piping and other equipment, for each of the four conditions, must be in conformance with established design limits. Supports for pressure-retaining components are designed in accordance with the rules of the ASME Boiler and Pressure Vessel Code, Section III, Division 1 (Ref. 1). The combination of loadings for each support, including the appropriate stress levels, meet the criteria of Regulatory Guide 1.124, "Design Limits and Loading Combinations for Class 1 Linear-Type Component Supports" (Ref. 2), and Regulatory Guide 1.130, "Design Limits and Loading Combinations for Class 1 Plate-and -Shell-Type Component Supports" (Ref. 3).

As part of a plant's conversion to the Improved Standard Technical Specifications (ISTS) or implementation of an amendment prior to conversion, the former TS requirements for snubbers and many other support systems were relocated to a licensee controlled document such as the Technical Requirements Manual (TRM) or a program document. The conversion submittal or split report amendment application identified the snubbers as a candidate for relocation based on the fact that the TS requirements did not meet any of the four criteria in 10 CFR 50.36(c)(2)(ii) for inclusion in the ITS. The removal of these requirements from the TS was classified as a relocation as opposed to a more restrictive or less restrictive change, and the NRC approved the relocation without placing any restriction on the use of the relocated requirements. Therefore, as is current practice, it was intended that when a snubber could not perform the required safety function for a system that is required to be OPERABLE by the TS, the licensee controlled document requirements for the support system would be invoked before the system TS LCO would become applicable. For example, if a snubber was determined to not meet the licensee controlled documents requirements, it needed to be either restored or replaced with a known working snubber within 72 hours, and an engineering evaluation would also need to be performed for the attached component within that same 72 hour period. If these actions are not completed within the allocated time, the system supported by the snubber would be declared inoperable and the Conditions and Required Actions for that system followed.

Seismic restraints are supports in the piping systems that transfer the seismic shock loading to permanent structures. They can be components such as snubbers, struts, whip restrains, etc. Seismic restraints used to transfer the seismic loads to the permanent structures can also be tie rods used for components such as pumps and motor operated valve actuators. Seismic restraints used to transfer the seismic loads to the permanent structures can also be structural braces used for pipe supports and other structures. The population of these devices that are only assumed to function in a seismic event is small. However, for these devices, the allowance proposed for snubbers is equally applicable.

LCO 3.0.6 only applies to those support systems which have their own TS. For support systems which are not in TS, when a supported system is made inoperable due to a non-TS support system being inoperable, the TS conditions and required actions for the supported system are required to be immediately entered.

The NRC Technical Specification Branch has taken the position that licensees are bound by Technical Specification LCOs 3.0.2 and 3.0.6 which require them to immediately enter the supported system Conditions and Required Actions when a snubber is removed for testing. In other words, once the snubber LCO is removed from the Technical Specifications, there is no exception from the Technical Specification requirements for snubbers and if a snubber is removed for testing, the supported system Conditions and Required Actions must be entered immediately. The only exception is if the supported system has been analyzed and determined to be OPERABLE without the snubber.

At the Winter 2000 Snubber Users Group (SNUG) meeting, Dr. Arnold Lee of the NRC presented the above position. At the meeting, it was stated that if a licensee has implemented the Improved Standard Technical Specifications and relocated the Snubber specification from the Technical Specifications, the 72 hour snubber Required Action and Completion Time in the TRM could not be utilized prior to entering the supported system TS Condition and Required Actions when testing snubbers. In a July 9, 1999 letter from the NRC to Duke Power (Ref. 4), the NRC agreed with this position.

At the June 13-14, 2000, TSTF/NRC meeting, Dr. Bill Beckner, Chief of the NRC Technical Specifications Branch, indicated that there was sufficient precedent to support a position that the 72 hour Completion Time can be considered a delay time. The NRC Technical Specification branch has stated that not having the 72 hour window to perform testing is an unintended burden that resulted from implementing the Improved Technical Specifications. An example of this precedence is in the NRC memorandum dated May 27, 1986, "Technical Specification Interpretation on Snubbers," which specifically stated that, "It should be recognized that the snubber TS are unique in that the operability requirements do not require consideration of associated system redundancy or impact until a snubber is out of service in excess of 72 hours." At that meeting, the NRC indicated that their preference for a resolution to the issue was some type of change to the Section 3.0 requirements. The intent of this proposed change is to preserve this precedent.

#### **4.0 TECHNICAL ANALYSIS**

The purpose of this change is to provide the same level of operational safety and flexibility provided by the snubbers as was provided prior to conversion to ITS or plant specific relocation of the snubber TS requirements. Prior to conversion to the ITS or plant specific relocation of snubber requirements, snubbers were located in the TS. If one or more snubbers were inoperable, the TS action statements for snubbers were taken. Under the pre-ITS conventions and rules, the supported system was not considered inoperable while the snubber action statements were being taken. Only when the snubber action times were expired (or if directed by the snubber action statements) was the supported system considered inoperable and it's the supported system TS action statements followed. This interpretation of the snubber TSs is based on the May 27, 1986 NRC memorandum (Ref. 5) which states, in part:

"Normally snubbers would only be removed from a system for testing/surveillance purposes at a time when the system is not required to be operable. If, however, a snubber is removed from service, for any purpose, for a system which is required to be operable, the action statement for snubbers would apply. The action statement requires that inoperable snubber(s), those removed for testing, be restored to operable service in 72 hours.

The action statement also requires that an engineering evaluation of the attached component be performed in accordance with specification 4.7.9.g or that the attached system be declared inoperable. This specification (4.7.9.g) notes that where snubbers are found inoperable, an engineering evaluation is to determine if the components to which inoperable snubbers are attached were adversely affected to assure that the component remains capable of meeting its designated service. The intent of this requirement is to assure that the system was not adversely affected by the inoperable snubber. This does not relate to the system or components capability to withstand a seismic event. Any degradation in seismic protection due to inoperable snubbers was taken into account in establishing the 72 hour allowed outage time.

When a snubber is removed from service for testing, an engineering evaluation need not be performed. If the snubber is not returned to service in 72 hours, that system would be declared inoperable at this time since the snubber allowable out-of-service time limit would be exceeded."

Snubbers did not meet the criteria for retention in the TS after ITS conversion or a plant specific relocation amendment and were relocated to a licensee controlled document, such as a Technical Requirements Manual (TRM) or a program document. This relocation did not alter the requirements on the snubbers, but allowed those requirements to be changed under the auspices of 10 CFR 50.59. An unintended consequence of that relocation is to require, under ITS LCO 3.0.2, the supported systems remaining in TS to be immediately declared inoperable and their Conditions and Required Actions taken when one or more snubbers is not capable of performing its required safety function.

This change in operation is not justified by any decrease in plant safety related to the relocation of the snubber requirements but is strictly an administrative consequence of the relocation. The plant design has not changed. The operational actions taken when one or more snubbers does not meet its requirements did not change as a consequence of the relocation. The snubbers continue to perform the function assumed in the safety analysis and the same actions continue to be taken if those snubbers cannot perform that function. However, under the ITS, the supported system must be declared inoperable and its Conditions and Required Actions followed, even to the point of a plant shutdown, even though there has been no change in the design or operation of the plant. This decreases plant safety and operational flexibility.

The proposed LCO 3.0.8 corrects this unintended consequence and restores the level of plant safety afforded by the snubbers prior to their relocation.

Seismic restraints did not appear in the pre-ITS Standard Technical Specifications. However, the justification presented below is equally applicable to restraints which are only assumed to operate in a seismic event as it is to snubbers. Applying this allowance to seismic restraints will increase plant flexibility in maintenance, testing, and repair with no significant impact on plant safety and potentially avoid requests for enforcement discretion to support needed activities.

The plant safety analyses assume that the required safety systems are OPERABLE, except for a single failure. The accident analyses do not consider the effect of an accident occurring while relying on Conditions and Required Actions. The purpose of TS Completion Times is to minimize the length of time that equipment can be out of service in order to minimize the probability that an accident could occur while the is equipment unavailable. As a result, this change has no effect on the safety analyses. The inoperability of TS supported systems will continue to be limited by the delay time associated with the snubbers and other seismic restraints and the Conditions and Required Actions of the supported system. These delay times were considered to be consistent with the safety analysis assumptions prior to relocation from the subject TS to the TRM and continue to be consistent with the safety analysis.

The analysis provided below considers snubbers and other seismic restraints not able to perform their associated support function(s) associated with only one train or subsystem of a multiple train or subsystem supported system or associated with a single train or subsystem supported system. At some plants, there is a limited population of snubbers which, by design, support more than one train or subsystem of a multiple train or subsystem supported system. LCO 3.0.8.b allows the application of the LCO 3.0.8 provisions to this population of snubbers. The generic analysis provided below does not

address LCO 3.0.8.b. Plants desiring to adopt LCO 3.0.8.b must provide a plant specific risk evaluation which demonstrates the acceptability of removing the snubbers in the applicable MODE or other specified condition in the Applicability and must demonstrate that the associated plant risk falls within the "normal work controls" range of Section 11 of NUMARC 93-01. The Bases of LCO 3.0.8 must list the snubber or other seismic restraint description (location, mark number, equipment number, etc.), the supported system, and the applicable MODE or other condition specified in the Applicability for the supported system for which the analysis demonstrates acceptable results with the snubber removed.

### Effect on Plant Risk

Pipe and equipment supports, in general, are not directly considered in developing the accident sequences for theoretical hazard evaluations. Further, some Probabilistic Risk Assessment (PRA) studies have indicated that snubbers are not of prime importance in a risk significant sequence (Ref. 6 and 7) and the function of snubbers is not essential in mitigating the consequences of a DBA or transient (Refs. 8 and 9). However, such studies may not be applicable to all U.S. plants. Therefore, a simplified risk assessment is provided to justify the proposed deferral time.

The initiating event of concern is loss of offsite power (LOOP). Ceramic insulators used in power distribution systems have a high confidence (95%) of low probability (5%) of failure (HCLPF) at an earthquake level of 0.09g. Thus, a 0.1g earthquake would be expected to have a 5% probability of causing a LOOP initiating event, resulting in a plant trip, starting and loading of emergency AC generators, and functioning of safety systems necessary to shut down the reactor and maintain it in a safe condition. This level of earthquake is assumed to fail the piping system for which the snubber(s) or other seismic restraints is out of service. This is a conservative bounding assumption for the assumed 0.1g earthquake. Piping systems are very rugged and the actual failure probability would be a function of the stress allowables and the number of snubbers or other seismic restraints removed for maintenance. Plants are designed such that failure of one train or subsystem should not impact the functionality of the remaining train or subsystem as the provision would be applied, at a given time, to only one train or subsystem of a multiple train or subsystem safety system. There would be a small conditional probability of seismic failure of the remaining train (due to very large earthquakes), but this number is considered negligible for this analysis.

Earthquake frequencies in different parts of the US vary widely, however, as a very general approximation, the following is assumed: Using the EPRI seismic hazard curves, the frequency of a 0.1g earthquake is approximately  $1E-3$  /yr for an Eastern US plant, and approximately  $1E-1$  /yr for a West Coast US plant.

For the limiting (West Coast) plant:

$1E-1$  earthquake frequency X  $5E-2$  failure probability for insulators =  $5E-3$  frequency for earthquake induced LOOP.

Given the earthquake induced LOOP, one train of mitigation will remain available. (Non earthquake LOOP initiators would continue to have two trains of mitigation available). A single train of safety grade equipment can be generally assumed to have a reliability of 98%. Thus, the probability of non-mitigation is 2%, or  $2E-2$ .

Thus, for the West Coast plant, the delta CDF would be  $5E-3 \times 2 E-2$ , or  $1E-4$ . For a 72 hour period, the ICDP would be  $1E-4 \times 72/8760 = 8 E-7$ .

For an Eastern US plant, the delta CDF would be  $1E-6$ , and the ICDP for a 72 hour period would be  $8E-9$ .

NRC Regulatory Guide 1.182, guidance for implementation of 10 CFR 50.65(a)(4), endorses NUMARC 93-01. Section 11 of NUMARC 93-01 provides the following table of ICDP values and risk management actions:

*ICDP and ILERP, for a specific planned configuration, may be considered as follows with respect to establishing risk management actions:*

ICDP		ILERP
$> 10^{-5}$	configuration should not normally be entered voluntarily	$> 10^{-6}$
$10^{-6} - 10^{-5}$	assess non quantifiable factors & establish risk management actions	$10^{-7} - 10^{-6}$
$< 10^{-6}$	normal work controls	$< 10^{-7}$

As can be seen, the ICDP for the limiting West Coast plant is within the "normal work controls" region. Therefore, the risk contribution from snubber or other seismic restraint removal is within the normal range of maintenance activities carried out at the plant. Risk management actions could be considered for the West Coast plant, as the value approaches the  $1E-6$  ICDP threshold for establishment of risk management actions. Also, if LCO 3.0.8 is frequently used at a West Coast plant, its use should be tracked such that the annual CDF is not increased by more than a minimal amount over the plant's baseline value.

For most plants in the Eastern US, the ICDP value is so small that tracking should not generally be necessary. Some Eastern plants may have higher local earthquake frequencies, and could conservatively be treated similar to the West Coast plants.

Despite the fact that the industry (a)(4) guidance does not currently address seismic risk, the use of LCO 3.0.8 should be considered with respect to other plant maintenance activities, and integrated into the existing (a)(4) process. This is necessary to ensure that maintenance on the remaining train is properly controlled, and emergent issues are properly addressed.

## **5.0 Regulatory Analysis**

### **5.1 No Significant Hazards Consideration**

The TSTF has evaluated whether or not a significant hazards consideration is involved with the proposed generic change by focusing on the three standards set forth in 10 CFR 50.92, "Issuance of amendment," as discussed below:

1. Does the proposed change involve a significant increase in the probability or consequences of an accident previously evaluated?

Response: No.



The proposed change allows a delay time before declaring supported TS systems inoperable when the associated snubber(s) or other seismic restraint(s) cannot perform its required safety function. Entrance into Actions is not an Initiator of any accident previously evaluated. Consequently, the probability of an accident previously evaluated is not significantly increased. The consequences of an accident while relying on the delay time allowed before declaring a TS supported system inoperable and taking its Conditions and Required Actions are no different than the consequences of an accident under the same plant conditions while relying on the existing TS supported system Conditions and Required Actions. Therefore, the consequences of an accident previously evaluated are not significantly increased by this change. Therefore, this change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Does the proposed change create the possibility of a new or different kind of accident from any accident previously evaluated?

Response: No.

The proposed change allows a delay time before declaring supported TS systems inoperable when the associated snubber(s) or other seismic restraint(s) cannot perform its required safety function. The proposed change does not involve a physical alteration of the plant (no new or different type of equipment will be installed) or a change in the methods governing normal plant operation. Thus, this change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Does the proposed change involve a significant reduction in a margin of safety?

Response: No.

The proposed change allows a delay time before declaring supported TS systems inoperable when the associated snubber(s) or other seismic restraint(s) cannot perform its required safety function. The proposed change restores an allowance in the pre-ISTS conversion TS which was unintentionally eliminated by the conversion. The pre-ISTS TS were considered to provide an adequate margin of safety for plant operation, as does the post-ISTS conversion TS. Therefore, the margin of safety is not significantly reduced by the proposed change. Therefore, this change does not involve a significant reduction in a margin of safety.

Based on the above, the TSTF concludes that the proposed change presents no significant hazards consideration under the standards set forth in 10 CFR 50.92(c), and, accordingly, a finding of "no significant hazards consideration" is justified.

## **5.2 Applicable Regulatory Requirements/Criteria**

This change does not alter compliance with any applicable regulatory requirements or criteria, but provides a delay time before declaring supported TS systems inoperable when the associated snubber(s) or other seismic restraint(s) cannot perform its required function. This delay time, similar to a Completion Time in the TS, does not alter the design or licensing basis of any system.

In conclusion, based on the considerations discussed above, (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed

manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the approval of the proposed change will not be inimical to the common defense and security or to the health and safety of the public.

#### **6.0 ENVIRONMENTAL CONSIDERATION**

A review has determined that the proposed change would change a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR 20, or would change an inspection or surveillance requirement. However, the proposed change does not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluent that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed amendment meets the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the proposed amendment.

## **7.0 REFERENCES**

1. ASME Boiler and Pressure Vessel Code, Section III.
2. Regulatory Guide 1.124, "Design Limits and Loading Combinations for Class 1 Linear-Type Component Supports," Revision 1, January 1978.
3. Regulatory Guide 1.130, "Design Limits and Loading Combinations for Class 1 Plate-and Shell-Type Component Supports," Revision 1, October 1978.
4. Letter dated July 9, 1999, from F. Rinaldi, NRC to H. Barron, Duke Energy Corporation, "McGuire Nuclear Station, Units 1 and 2 RE: Licensing Position Regarding Snubbers (TAC NOS. MA5519 and MA5520)."
5. NRC Memorandum dated May 27, 1986, from H. Denton to C. Norelius, "Technical Specification Interpretation on Snubbers."
6. "Zion Probabilistic Safety Study," Commonwealth Edison Company, September 1981.
7. "Millstone Unit 3 Probabilistic Safety Study," North-East Utilities Company, August 1983.
8. NRC Staff Review of Nuclear Steam Supply System Vendor Owners Groups' Application of the Commission's Interim Policy Statement Criteria to Standard Technical Specifications. Attachment to letter dated May 1988 from T. E. Murley, NRC to W. Wilgus, Chairman the B&W Owners Group.
9. WCAP-11618, "MERITS Program-Phase II, Task 5, Criteria Application," including Addendum 1 dated April, 1989, Section 3.7.9.