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MAY 2 7 2004

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
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Washington DC 20555

**SUSQUEHANNA STEAM ELECTRIC STATION
RESPONSE TO REQUEST FOR ADDITIONAL
INFORMATION FROM NRC ON PROPOSED
RELIEF REQUEST NO. 3RR-03 TO THE
THIRD 10-YEAR INSERVICE INSPECTION
PROGRAM FOR SUSQUEHANNA SES UNITS 1 AND 2**
PLA-5753

**Docket Nos. 50-387
and 50-388**

Reference: Letter from R. V. Guzman (NRC to B. L. Shriver (PPL), "Request for Additional Information (RAI) – Susquehanna Steam Electric Station, Units 1 and 2 (SSES 1 and 2) – Third 10-Year Inservice Inspection Interval Program Plan RE: Snubber Testing Program," dated February 20, 2004.

This letter is in response to the above reference letter. The attachment to this letter contains PPL Susquehanna, LLC's response to the Request for Additional Information.

There are no new commitments made in this letter. If you have any questions, please contact Mr. C. T. Coddington at (610) 774-4019.

Sincerely,

B. L. Shriver

Enclosure: Response to NRC Request for Additional Information Relating to Relief Request No. 3RR-03

Attachments:

Attachment 1 - ST-100-001
Attachment 2 - Specification M-1090
Attachment 3 - NEPM-QA-0595, Rev. 3
Attachment 4 - Unit 1 TRM Section 3.7.8 and Bases Section B.3.7.8

copy: NRC Region I
Mr. R. V. Guzman, NRC Project Manager
Mr. S. Hansell, NRC Sr. Resident Inspector
Mr. R. Janati, DEP/BRP

A047

Enclosure to PLA-5753

Response to NRC Request for Additional Information Relating to Relief Request 3RR-03

RESPONSE TO NRC REQUEST FOR ADDITIONAL INFORMATION RELATING TO RELIEF REQUEST 3RR-03

NRC Question 1:

In Relief Request No. 3RR-03, the licensee, PPL Susquehanna, LLC (PPL), presented the American Society of Mechanical Engineers (ASME), Boiler and Pressure Vessel Code requirements (ASME Code) in the 1989 Edition, Section XI, Paragraphs IWF-5200(a) and IWF-5300(a), IWF-5200(b) and IWF-5300(b), and IWF-5200(c) and IWF-5300(c), for snubber visual examination, functional testing, and attachments, respectively. Under the "Basis for Relief" section of their September 16, 2003, submittal, PPL states that the Technical Requirements Manual (TRM) snubber program maintains the same confidence level of quality and safety as that of OMa-1988, Part 4, for the visual examination, functional testing, and the examination of snubber attachments (including lugs, bolting, pins, and clamps). However, PPL does not provide an adequate basis for this statement.

a. Discuss how the TRM snubber program maintains the required confidence level for the snubber surveillance activities.

b. For snubber attachments, identify each specific ASME Code requirement in Subsection IWF for which the relief applies, and provide the basis on which to conclude that the TRM program will be able to meet the intent of such requirements.

PPL Response 1a:

The requirements for PPL's snubber program are detailed in each Unit's TRM Section 3.7.8 and TRM Bases Section B3.7.8. The program requires the following surveillances to be performed:

- Demonstrate that each snubber is operable by performing a visual inspection with the inspection frequency based upon the number of unacceptable visually inspected snubbers in the previous interval with a maximum of 48 months,
- Functionally test a representative sampling of all snubbers once per 24 months,
- Monitor the installation and maintenance records for each snubber to ensure that the service life has not been exceeded and will not be exceeded prior to the next snubber surveillance inspection,
- Test the snubbers that are in locations of snubbers that failed the functional test during the previous test period,
- Perform an inspection on snubbers attached to sections of systems that have experienced potentially damaging transients as determined from a review of operational data and a visual inspection of the systems within.

The basis for each of the surveillance requirements is:

- The visual inspection frequency is based upon maintaining a constant level of snubber protection to systems. The TRM snubber program uses the guidance in Generic Letter 90-09 for the method of determining the next interval for the visual inspection of snubbers based upon the number of unacceptable snubbers found during the previous inspection, the total population or category size for each snubber type, and the previous inspection interval.

  Visual inspections shall verify that (1) the snubber has no visible indications of damage or impaired operability, (2) attachments to the foundation or supporting structure are functional, and (3) fasteners for the attachment of the snubber to the component, and to the snubber anchorage are functional.

- A representative sample of snubbers for each type of snubber is tested. The representative sample is randomly selected and are representative of the various configurations, operating environments, range of size, and capacity of snubbers of each type.

  The snubber functional test shall verify that (1) activation (restraining action) is achieved within the specified range in both tension and compression, (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 directions of travel, and (4) for snubbers specifically required not to displace under continuous load, the ability of the snubber to withstand load without displacement.

- The maximum expected service life for various seals, springs and other critical parts shall be determined and established based on engineering information and shall be extended or shortened based on monitored test results and failure history. Critical parts shall be replaced so that the maximum service life will not be exceeded during a period when the snubber is required to be operable.

- Snubbers that are in locations of snubbers that failed the functional test during the previous test period shall be tested during the next test period. This testing ensures that there are no generic or technical issues with the location of the snubber.

- Snubbers attached to sections of systems that have experienced potentially damaging transients shall be inspected to ensure their operability. The required inspection consists of the following elements: (1) Perform a visual inspection of all affected snubbers, and (2) verify freedom of motion of mechanical

snubbers by manually induced snubber movement, or (3) verify freedom of motion of mechanical snubbers, by evaluation of in-place snubber piston setting, or (4) verify freedom of motion of mechanical snubbers by stroking the mechanical snubber through its full range of travel.

The requirements are implemented by (1) NEPM-QA-0595, "Snubber Program," (2) Surveillance Procedures ST-100-001 for Unit 1 and ST-200-001 for Unit 2, "Snubber Visual Inspection," and Specification M-1090, "Inservice Testing of Safety-Related Mechanical Snubbers, Hydraulic Snubbers and Compensating Struts." Surveillance Procedure ST-100-001, Specification M-1090 and NEPM-QA-0595 are contained in Attachments 1, 2, and 3, respectively.

Surveillance Procedures ST-100-001 and ST-200-001 require the following:

- Personnel performing this surveillance (visual inspection of snubbers) shall be VT-3 certified.
- The visual inspection shall include:

1. Presence of mechanical interferences which would inhibit snubber motion.
2. Loss of integrity of pinned/bolted connections as evidenced by broken connections or disengaged pins/bolts.
3. Large dents or other major deformations in the Snubber housing, support cylinder, or position indicating tube to an extent that snubber movement would be hindered.
4. Scratches and other superficial surface defects are acceptable.
5. Total separation of spherical ball bushings from their socket.
6. Material coating the exterior of the snubber to an extent that snubber movement would be hindered.
7. Anchor plate loose or pulled away from support structure or embedment material.
8. Embedment material is cracked/concrete is spalled.
9. Snubber is bottomed/topped out.
10. Cracked material/welds or bent components on hanger support structures, anchor plates, etc.
11. Loose clamping, loose clamp hex nut.
12. Snubber frozen in place and/or cold set out of tolerance (± ½").
13. Check hydraulic snubber for hydraulic fluid levels.

The Surveillance Procedures contain a checklist to document the above areas of inspection. The checklist encompasses the checklist from ASME/ANSI OMa-1988, Part 4.

Specification M-1090 details the functional testing requirements for snubbers and compensating struts. The functional testing requirements in Specification M-1090 are:

a. Breakaway force test in both tension and compression,

b. Activation level test,

c. Post-Activation Displacement Test, and

d. Running Drag Force Test.

The functional testing encompasses the requirements of ASME/ANSI OMa-1988, Part 4. The functional testing requirements and acceptance criteria are detailed in Attachment 2.

The TRM snubber program does not include those welded attachments associated with ASME Code, Section XI, Subsection IWB, IWC, IWD, and IWE and as such PPL is not requesting relief from the Code requirements for Subsections IWB, IWC, IWD, or IWE. The TRM snubber program does include those attachments associated with IWF. Therefore, PPL is requesting relief from the requirements of the 1998 Edition through the 2000 Addenda of ASME Section XI, Subsection IWF in its entirety.

Based on the information provided above the PPL Snubber Program as presented in the TRM maintains the same confidence level of quality and safety as that of OMa-1988, Part 4.

PPL Response 1b:

As stated in response to Question 1a, PPL is requesting relief from the requirements of the 1998 Edition through the 2000 Addenda of the ASME Section XI, Paragraphs IWF-5200(c) and IWF-5300(c) which require examination of snubber attachments with IWF. The examination of snubber attachments per IWF-5200(c) and IWF-5300(c), which includes bolting, pins, and clamps, is performed in accordance with the TRM snubber program. The response to Question 1a provides the requirements for the visual inspection of the snubber attachments. These requirements meet the intent of Subsection IWF. PPL is not requesting relief from the examination of welded attachments (lugs and wrapper plates) as they are part of PPL's IWB, IWC, IWD, and IWE inspection programs.

NRC Question 2:

Under the "Proposed Alternate Examination" section of the submittal, PPL states, "it should be noted that snubber welded attachments will be performed in accordance with the ASME Section XI Subsections IWB, IWC, and IWD welded attachment examination requirements." This sentence is not clear.

a. Will the Inservice Inspection of snubber welded attachments be performed in accordance with ASME Code, Section XI, Subsection IWB, IWC and IWD? Present adequate information to support your proposed alternative.

b. Provide a detailed explanation of how Subsection IWB, IWC and IWD requirements are related to the acceptability of the TRM program, as an alternative examination requirement for snubber attachments.

PPL Response 2a:

Yes. All welded attachments, including those of snubbers, are covered under Subsections IWB, IWC, and IWD, Tables IW(B)(C)(D)-2500-1, Examination Categories B-K, C-C, and D-A. There is no proposed alternative or relief requested from these requirements. Snubber welded attachments are not inspected as part of the PPL TRM snubber program and are not a part of the Relief Request 3RR-03.

PPL Response 2b:

Subsections IWB, IWC, and IWD are not being used as alternative examination requirements. The requirements of IWB, IWC, and IWD discussed in Response 2a above will be maintained and are not a part of Relief Request 3RR-03. For snubbers, these requirements are in addition to the proposed alternative to use the PPL TRM snubber program as identified in Responses 1a and 1b above.

NRC Question 3:

The staff has determined that the following areas of the TRM Bases are needed to complete the review of proposed Relief Request 3RR-03.

a. TRM Bases page TRM/B-3.7-25 states that potentially damaging transients are determined from a review of operation data and a visual inspection of the system (Condition D), but does not specify the technical requirement surveillance (TRS) inspection requirements after the determination of a potentially damaging transient. Please provide a detailed description and basis with regard to how and when you will perform an inspection of all snubbers attached to section of systems that experience

these transients. (e.g. if applicable, provide your commitment to perform these inspection in your response letter).

b. Provide a detailed discussion of the functional testing requirements of snubbers, including the number of representative samples of snubbers required to be tested, and the condition under which a successful testing program can be achieved.

PPL Response 3a:

Surveillance Requirement TRS 3.7.8.5 states that "An inspection shall be performed of all snubbers attached to sections of systems that have experienced unexpected potentially damaging transients as determined from a review of operational data and a visual inspection of the systems." Further, this surveillance is required to be carried out within six months of the transient. The Bases for TRS 3.7.8.5 provides the requirements for the required inspections of snubbers associated with damaging transients.

PPL Response 3b:

The Basis of functional testing is described in TRM Bases Section B3.7.8 in the section discussing TRS 3.7.8.2. The snubber inspection philosophy is presented on TRM Table 3.7.8-3. The snubber program is documented in NEPM-QA-0595, which is included as Attachment 3. Also, a discussion of snubber functional testing is provided in response to Question 1a. The current Unit 1 TRM Section 3.7.8 and Bases Section B 3.7.8 are provided as Attachment 4. The Unit 2 TRM Section in 3.7.8 and Bases Section B 3.7.8 are the same as Unit 1.

Attachment 1 to PLA-5753

ST-100-001

PROCEDURE COVER SHEET

PPL SUSQUEHANNA, LLC PROCEDURE	
SNUBBER VISUAL INSPECTION ADHERENCE LEVEL: INFORMATION USE	11-3-03 ST-100-001 Revision 2 Page 1 of 12

QUALITY CLASSIFICATION:	APPROVAL CLASSIFICATION:
(X) QA Program ( ) Non-QA Program	(X) Plant ( ) Non-Plant ( ) Instruction

EFFECTIVE DATE: _____

PERIODIC REVIEW FREQUENCY: N/A

PERIODIC REVIEW DUE DATE: N/A

RECOMMENDED REVIEWS:

Procedure Owner: John E. Lines

Responsible Supervisor: Supervisor-NDE-SSES

Responsible FUM: Manager-Nuclear Design Engineering

Responsible Approver: Manager-Nuclear Design Engineering

PROCEDURE REVISION SUMMARY

TITLE: SNUBBER VISUAL INSPECTION

1) Administrative Change.

2) Incorporated new Procedure Standards.

TABLE OF CONTENTS

ATTACHMENTS

1. PURPOSE/SCOPE

1.1 The purpose of this procedure is to provide instructions for visual inspection of snubbers and compensating struts, as required by Unit 1 TRS 3.7.8.1 and TRS 3.7.8.5 (if applicable).

1.2 This surveillance applies to the inspection of installed, safety related snubbers and compensating struts at Susquehanna SES Unit 1. Common unit snubbers are included in Unit 1 inspection. Though installed non-safety related snubbers may be inspected by the same program/criteria, their failures are not "TRM failures", rather, they are addressed by NDAP-QA-0702, Action Request and Condition Report Process, or NDAP-QA-0502, Work Order Process.

1.3 The frequency of visual inspection surveillances depends on the number of inoperable snubbers/compensating struts identified during previous visual inspections. TRM allows separating snubbers/compensating struts into two categories: *those accessible during operation* and *those inaccessible during* operation. The inspection frequency of the two categories can be determined independently.

2. REFERENCES

2.1 TRS 3.7.8.1

2.2 TRS 3.7.8.5

2.3 NEPM-QA-595, Snubber Program

2.4 NDAP-QA-0722, Surveillance Testing Program

2.5 IOM #272, Mechanical Shock Arrestors Models PSA-1/4, -1/2, -1, -3, -10, -35, and -100.

2.6 IOM #855, Compensating Struts Models PSB-.05 and -.12

2.7 NDAP-00-0626, Radiologically Controlled Area Access and Radiation Work Permit (RWP) System

2.8 NEIM-00-1164, Snubber Visual Inspection Data Review Program

2.9 NDAP-QA-0702, Action Request and Condition Report Process

2.10 NDAP-QA-0502, Work Order Process

2.11 NDAP-QA-0028, Document Submittals, Copyright Compliance and Document Access and Release Program

3. SPECIAL TOOLS/EQUIPMENT

None

4. PRECAUTIONS

4.1 When a snubber is determined inoperable, Operations shall be notified immediately. Notification should be by use of Work Order or AR-CR Report Process.

4.2 Snubbers are delicate precision mechanisms, regardless of their physical size. Do not use Snubbers for steps, hand holds, grounds for welding, or rigging points. Rough handling, twisting, or abuse may cause internal/external damage to the Snubbers. Snubbers subjected to rough handling/abuse as determined by the Snubber Program Coordinator or his designee shall be functionally tested to prove operability.

5. PREREQUISITES/LIMITATIONS

5.1 An RWP has been obtained if required, in accordance with reference 2.7.

5.2 Personnel performing this surveillance shall be VT-3 certified.

6. PROCEDURE

NOTE (1):	The physical limits of snubber visual surveillance inspections are shown by the cloud on Attachment B. Insulation covering the pipe clamp or end bracket need not be removed. However, damaged insulation may indicate loose fasteners and shall be noted.
NOTE (2):	Non-conforming conditions outside the visual surveillance boundary shall be CR'd. If rework/repair is necessary, a separate work order document shall be generated (per reference 2.9 and 2.10 respectively).
NOTE (3):	During Snubber Visual Inspection, conditions may be found which do not affect snubber operability. (Examples include: snubber scale missing or illegible, damaged insulation, loose hexnuts on load studs, loose locknuts on snubber or clamps, missing hanger tag, etc.). If conditions like these are found, they may be corrected under an existing work order document. The conditions and their corrections shall be documented on Snubber Customer Notification Forms per Reference 2.8. These types of conditions are generally considered acceptable for surveillance purposes because they are cosmetic.
NOTE (4):	ISI to check NIMS for work activities on lines with required Snubber Visual Surveillance inspections and schedule those inspections prior to other work being released to document the as found setting. When a cold set problem is found, inspectors are required to walk lines down from Anchor to Anchor (or to where the problem is found).

6.1 Visual Acceptance/Rejection Criteria

Visually inspect each snubber to determine the general mechanical and structural condition. Document this inspection on Form ST-100-001-2 (Attachment D). This inspection shall include:

6.1.1 Presence of mechanical interferences which would inhibit snubber motion.

6.1.2 Loss of integrity of pinned/bolted connections as evidenced by broken connections or disengaged pins/bolts.

6.1.3 Large dents or other major deformations in the Snubber housing, support cylinder, or position indicating tube to an extent that snubber movement would be hindered.

(Scratches and other superficial surface defects are acceptable.)

6.1.4 Total separation of spherical ball bushings from their socket.

6.1.5 Material coating the exterior of the snubber to an extent that snubber movement would be hindered.

6.1.6 Anchor plate loose or pulled away from support structure or embedment material.

6.1.7 Embedment material is cracked/concrete is spalled.

6.1.8 Snubber is bottomed/topped out.

6.1.9 Cracked material/welds or bent components on hanger support structures, anchor plates, etc.

6.1.10 Loose clamping, loose clamp hex nut.

6.1.11 Snubber frozen in place and/or cold set out of tolerance (± ½").

6.1.12 Check hydraulic snubber for hydraulic fluid levels.

6.2 Snubbers unacceptable per Section 6.1 of this procedure will be evaluated by the Snubber Program Coordinator or his designee. Snubbers determined to be in violation of section 6.1 are visual failures. A CR shall be written to address the operability of the failure and require the functional testing of the snubber as part of its disposition.

6.3 The functional testing results of visual failure snubbers will be used as follows:

6.3.1 For functional test failures:

a. The hanger/piping associated with the failure will be evaluated for stress. If the evaluation requires additional NDE/NDE rework, it must be performed.

b. Following the hanger/pipe evaluation and the satisfactory completion of required additional NDE/NDE rework, the hanger and system may be declared operable and the WO/CR closed. The snubber remains inoperable until reworked and passing its functional test.

6.3.2 Passing functional tests allow the hanger, system, and snubber to be declared operable. The WO and CR can then be closed.

6.4 Following completion of snubber visual inspections, the Snubber Program Coordinator or his designee shall review the Data Forms and CRs to determine the proper interval for the next Visual Inspection (in accordance with TRS 3.7.8.1).

NOTE:	Snubbers which are unacceptable per section 6.1 of this procedure, which could not meet the Functional Test Acceptance Criteria, are inoperable for the next Visual Inspection Interval Determination. Unacceptable snubbers functionally tested and meeting functional test acceptance criteria are considered operable for the Visual Inspection Interval Determination.

6.5 **WHEN** inspections are complete, **AND** the visual surveillance interval calculated (see ref. 2.1 and 2.4), **Record** findings per Section 6.1, 6.2, and 6.4, on the Snubber Visual Inspection Data Form, Form ST-100-001-1 (Attachment A).

6.6 **WHEN** the Snubber Visual Inspection Data Form, Form ST-100-001-1 is complete, the Snubber Program Coordinator or his designee shall **Forward** the Surveillance Authorization Cover Sheet and Data Form to the Supervisor-NDE SSES for signoff.

7. RECORDS

The completed Snubber Visual Inspection Form (Form ST-100-001-1) and the Snubber Visual Inspection Checklist (Form ST-100-001-2), and a computerized sort of the snubbers inspected shall be attached to the Surveillance Authorization Coversheet and be sent to the Work Control Center for closure. These records will be stored and retained by CM-DCS in accordance with NDAP-QA-0722 and NDAP-QA-0028.

DATA FORM
ST-100-001
SNUBBER VISUAL INSPECTION

ACCEPTANCE CRITERIA		INITIAL
All applicable snubbers have been visually inspected. (Section 6.1) (TRS 3.7.8.1)	YES/NO	_____
All snubbers have met the Acceptance Criteria. (Section 6.1)	YES/NO	_____
REQUIRED ACTION (Acceptance Criteria not met)		
A CR has been initiated and dispositioned for each visually inoperable snubber. (Section 6.2)	YES/NO/NA	_____
	(# SNUBBERS)	_____
Shift Supervision has been notified of each snubber determined inoperable by submittal of a Work Order or a CR. (Section 6.2)	YES/NO/NA	_____
	(# SNUBBERS)	_____

INTERVAL FOR NEXT VISUAL INSPECTION

The next Visual Inspection interval has been calculated per TRS 3.7.8.1 and the Surveillance Authorization (RTSV) has been determined. (Section 6.4) (TRS 3.7.8.1).

- Number of visually inop snubbers _____
- Less those snubbers with failure established/remedied and passing functional test _____
- Number of visual failures for Inspection Interval Calculation _____

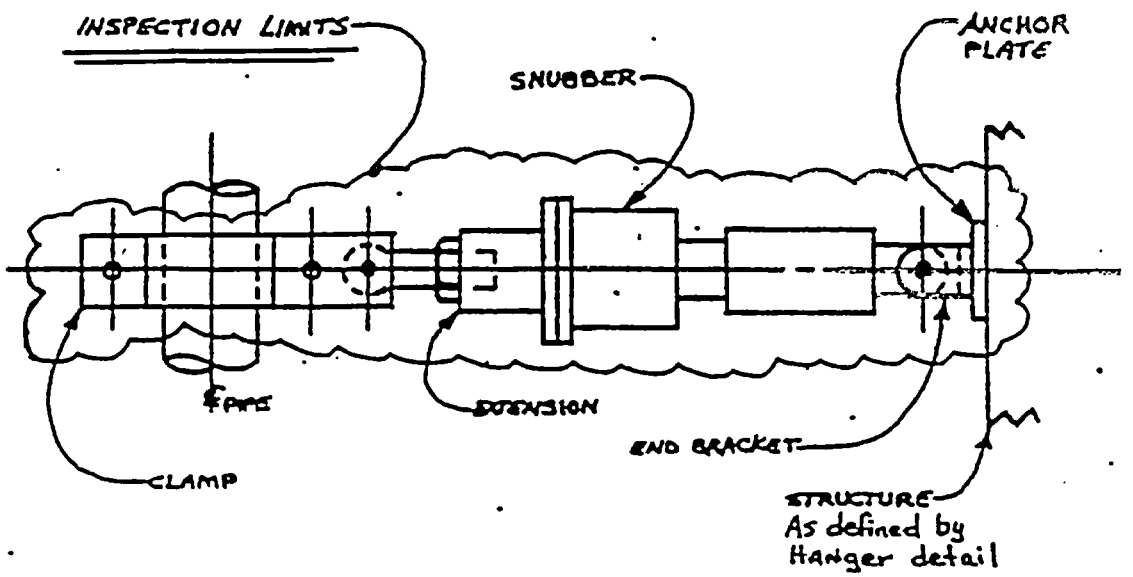
_____ Completion date of this visual inspection
_____ Due date for the next visual inspection
_____ Violation date for the next visual inspection

COMMENTS:

Visual Testing Surveillance ST-100-001 is complete (Section 6.6).

_____/_____
Supervisor-NDE-SSES Date

TR Visual Inspection Boundary



Attachment C
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Typical Sort of Visual Inspection Data

UNIT 1 - 9TH VISUAL INSPECTION SURVEILLANCE REPORT

ID		SERIAL	PFD	CR	SYS	MEMO1 MEMO2	
DBA 101H	8	03577	P		161A		AF 3 5/8
DBA 101H	9	03594	P		161A		AF 1
DBA 101H	10	03570	P		161A		AF 2 3/4
DBA 101H	15	19514	P		161A		AF 2 1/2
DBA 101H	19	04583	P		161A	WELDED TO I-BEAM, BOLT NOT VISIBLE	AF 3 1/2
DBA 101H	20	19392	P		161A		AF 1 1/2
DBA 101H	21	04571	P		161A		AF 2
DBA 101H	35	04144	P		161A		AF 2 3/4
DBA 101H	36	05254	P		161A		AF 2 5/8
DBA 101H	40	00108	P		161A		AF 4
DBA 101H	46	20788	P		161A		AF 2 1/8
DBA 101H	47A	00318	P		161A		AF-3 1/8
DBA 101H	47B	00317	P		161A		AF 2 1/2
DBA 102H	6	00101	P		152A		AF 4
DBA 102H	7	00102	P		152A		AF 4 3/8
DBA 102H	10	01361	P		152A		AF 2 1/2

Attachment D
ST-100-001
Revision 2
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SNUBBER VISUAL INSPECTION CHECKLIST

SNUBBER INFO/ID: _____ SERIAL #: _____

SIZE/FIGURE: _____ WO #: _____ COLD SET: _____

NO	YES	SNUBBER INSPECTIONS: # Generate a SCNF for this response * May be an immediate operability concern!		
	*#	Interferences inhibit snubber motion including insulation (Contact ISI prior to removal, picture required).		
	*#	Material coats the exterior of the snubber (Contact ISI prior to removal, picture required).		
#*		Integrity of the pinned or bolted connections are satisfactory (broken/disengaged/missing connections) (Contact ISI prior to removal, picture required).		
	*#	Spherical ball bushings are totally separated from their installed position (Contact ISI prior to removal, picture required).		
	*#	Snubber is bottomed out in either direction (Contact ISI prior to removal, picture required).		
	*#	Large dents, arc strikes, or major deformations exists.		
*#		Support/support structure/anchor plate is intact (No cracked welds, bent steel, etc.).		
	*#	Embedment material is cracked/concrete is spalled.		
	*#	Anchor plate is loose/pulled away from support structure.		
	#	Spacing washers (snubber or clamp) are missing.		
	#	Pivot pin snap rings/cotter pins are missing.		
		One black orientation arrow exists pointing to pipe (If not - mark correctly).		
#		Indicator tube screws are tight.		
		Indicator tube closest to pipe.		
#		A snubber I.D. tag is attached (may be a homemade tag).		
		Serial number is correct per WO (serial number must match prior to removal).		
		Snubber map location correct.		
#		Snubber figure and size matches WO		
		NA		
*#			Hydraulic snubber fluid level acceptable	
#			For double; is A/B in correct location?	
	#		If insulated clamp, is insulation damaged? (N/A if uninsulated)	
#			Is visible clamping secure, clamp hex nuts not loose or missing.	
	*#		As Found set is out of tolerance + or - 1/2"	As Found Set _____

OTHER COMMENTS:

SCNF # _____

Inspected by VT-3 & Date : _____ PPL Review By & Date: _____
VT-3 Level II or III

g:\goadmin\lic\PLA\5700\5753att1.doc

Attachment 2 to PLA-5753

Specification M-1090

ASME SECTION III OR XI	☒ (5)	(1) SPECIFICATION NO.	M-1090
SAFETY RELATED	☒	(2) REV.	9
OTHER QUALITY	☐	(3) PAGE 1	(4) OF 23
NON QUALITY	☐		

NUCLEAR ENGINEERING SPECIFICATION

FOR

(6) INSERVICE TESTING OF SAFETY-RELATED MECHANICAL SNUBBERS, HYDRAULIC SNUBBERS AND COMPENSATING STRUTS 9

SUSQUEHANNA STEAM ELECTRIC STATION, UNITS 1 AND 2
PPL SUSQUEHANNA, LLC
ALLENTOWN, PENNSYLVANIA

(8) Prepared Mark S. Isaac Date 1/14/03
Signature

(9) Verified C. L. Dvorack Date 1/16/03
Signature

(10) Approved John A. Swankoski Date 1/20/03
Signature

John A. SwanKoski
Printed Name

(11) Responsible Group Nuclear Design Engineering
Civil Structural Design Group 9

(7) Description of Change

Incorporated SCN 8, added Hydraulic Snubber Testing Requirements, Updated References to Groups and PPL.

INDEX

1.0 SCOPE

1.1 PURPOSE

This specification defines the requirements and acceptance criteria of an inservice functional testing program for safety-related mechanical snubbers, hydraulic snubbers and compensating struts. This testing is performed to satisfy the SSES Technical Requirements Manual (TRM). | 9

1.2 LIMITATIONS

The scope of this specification is limited to the inservice functional tests of safety-related mechanical snubbers, hydraulic snubbers and compensating struts. It does not address the visual inspection requirements as dictated by the SSES Technical Requirements Manual (TRM). | 9

1.3 RESPONSIBILITIES

1.3.1 PPL Susquehanna, LLC | 9

a. Inservice Inspection (ISI) Group: Will assume the overall responsibility for coordinating plant activities for snubber testing. This includes staffing, planning, work flow, scheduling and interfacing with affected plant organizations. The ISI Group will determine the sample sizes and the specific snubbers that are to comprise those sample sizes. The ISI Group will establish the contract with the testing vendor and specify the number of test machines required. The ISI Group will monitor the day to day activities of the functional testing contractor. The ISI Group will be responsible for interpretation of data provided by the testing vendor, specifically, functional testing results.

b. Maintenance: Removal and installation of snubbers and compensating struts as required by the ISI Group. Maintenance will handle decontamination activities.

c. Nuclear Design Engineering Civil/Structural Design Group: Will assist the ISI Group as required. Civil/Structural Design Group will analyze the effect of failed snubbers on piping and supports. They will provide input to the ISI Group for selection of the testing vendor. Civil/Structural Design Group will be responsible for interpretation of failure analysis data. | 9 | 9

1.3.2 Contractor Supplying Services

The Contractor performing inservice testing shall be responsible for developing a program and procedures to satisfy the requirements of 4.0. As a minimum, the program shall address the following:

a. Scope
b. References
c. Test equipment used (including calibration data) and any precautions or limitations required
d. Test Procedure(s)

e. Data sheets
f. Acceptance criteria
g. Personnel qualifications

All testing should be conducted at the Susquehanna Steam Electric Station. Off-site testing may be conducted pending approval by PPL. All test results shall be recorded in a format approved by PPL. This format shall include, as a minimum: | 9

a. Size, model, serial number, type, and hanger mark number of the snubber or compensating strut tested
b. Functional test results
c. Information to identify the test performed and date
d. Interpretation of "Anomalous" test results
e. Signature(s) of personnel performing the test(s)

In addition, the Contractor shall be responsible to provide daily calibration check sheets to the ISI Supervisor or alternate for the testing machine(s) in service.

2.0 GENERAL INFORMATION

The margins of this specification are marked with a vertical line and revision number to indicate where changes have been made. This is done for information only and PPL assumes no liability whatsoever for inaccuracies in these notations. Bidders, Contractors and other Non-Nuclear Engineering organizations are cautioned to evaluate the requirements of this document based on the entire content irrespective of the marginal notation and relationship to the previous issue. | 9

2.1 DEFINITIONS

a. Mechanical Snubber - An acceleration sensitive device which provides restraint to a component or system during a sudden application of abnormal forces but allows free motion during normal thermal movement. Acceleration is maintained at the design threshold without locking, hence the mechanical snubber will not become locked in a fixed position by a sustained, uninterrupted force.

b. Hydraulic Snubber – A velocity sensitive device which provides restraint to a component or system during a sudden application of abnormal forces, but allows free motion during normal thermal movement. Velocity is maintained at the design threshold without locking. | 9

c. Mechanical Compensating Strut - An acceleration sensitive device which provides restraint to a component or system during a sudden application of abnormal forces but allows free motion during normal thermal movement. When the predetermined threshold acceleration is exceeded, the compensating strut locks up becoming a rigid restraint and allows no further free motion until the applied force drops to or near zero. | 9

d. Breakaway Force - The minimum force required to initiate the linear telescoping motion (extension or retraction) of a snubber or compensating strut. It is often specified as a percentage of the rated load. | 9

e. Drag Force - The force required to maintain snubber linear telescoping motion at a constant velocity prior to activation.

f. Activation - Initiation of the restraining action of a snubber or compensating strut occurring when the threshold acceleration or velocity(activation level) is exceeded.

g. Degraded Snubber - A snubber which, when tested, meets all the required acceptance criteria but has less than a 20% margin until the acceptance criteria is exceeded. In other words, if a tested snubber is at greater than 80% of its breakaway, drag or activation level acceptance criteria but still not exceeding the acceptance criteria, the snubber is classified as degraded. Note that a degraded snubber is not a failure as far as TRM requirements are concerned.

h. Rebuilt Snubber - A snubber which has had a part replaced. (internal)

i. New Snubber - A snubber which has never been in service.

j. Spare Snubber - A snubber which has seen previous service and has not been rebuilt.

2.2 SAFETY-RELATED SNUBBERS AND COMPENSATING STRUTS

The official database of record for all mechanical snubbers, hydraulic snubbers and compensating struts is the Component Management Database of the Nuclear Information Management System (NIMS). A listing of safety-related (and non-safety related) snubbers and compensating struts may be extracted from this controlled database.

2.3 FUNCTIONAL TEST SAMPLE SIZE AND COMPOSITION

2.3.1 Snubbers

For mechanical and hydraulic snubbers, the inservice functional testing sample size and composition shall be in accordance with the appropriate unit's Technical Requirements Manual. In addition, when a hanger installation which utilizes a parallel pair of snubbers is selected as part of the representative sample, both snubbers of such installations shall be functionally tested and counted in the sample size. Parallel pair hanger can be identified using the NIMS Component Management Database. If one snubber of a parallel pair fails, it must be replaced with the same size and type of snubber (i.e. Pacific Scientific). Testing of failed snubbers during the next outage shall include both snubbers of a parallel pair, even if only one snubber of the pair had previously failed.

The NIMS Component Management Database shall be used to identify hanger installations which utilize safety related snubbers.

2.3.2 Compensating Struts

For mechanical compensating struts, the inservice functional testing sample size shall be in compliance with the appropriate unit's Technical Requirements Manual.

The NIMS Component Management Database shall be used to identify hanger installations which utilize safety-related compensating struts.

3.0 REFERENCES

The following documents are a part of this specification to the extent specified herein:

3.1 SSES Technical Requirements Manual (TRM), Section 3.7.8.

3.2 Examination and Performance Testing of Nuclear Power Plant Dynamic Restraints (Snubbers), ANSI/ASME OM4-1982.

3.3 Snubber Reliability Improvement Study, EPRI Report EPRI NP-2297, March 1982.

3.4 PPL Technical Specification M-1067, Pipe Supports. 9

3.5 Lisega Hydraulic Snubber Technical Manual.

3.6 PSA-4, Mechanical Shock Arrestors, Pacific Scientific Company.

3.7 PSB-2, Compensating Struts, Pacific Scientific Company.

3.8 M1037, General Specification for Engineering Program for Review and Disposition of Safety Impact Items. 9

3.9 MFP-QA-2200, Nuclear Safety Impact Item Assessment

If a conflict exists between any referenced document and a portion of this specification, the specification shall govern and the conflict shall be brought to the attention of Nuclear Design Engineering Civil/Structural Design Group. 9

4.0 TECHNICAL REQUIREMENTS

4.1 SNUBBER AND COMPENSATING STRUT REMOVAL AND REINSTALLATION

Maintenance is responsible for the removal of snubbers and compensating struts for bench testing. All personnel involved with this effort shall have training regarding the care and handling of snubbers and compensating struts.

The as found stroke position of PSA-1/4 & 1/2 inservice snubbers whenever possible, shall be preserved by utilizing a suitable means of holding the position indicator tube in a fixed position relative to the support cylinder. For all other snubber sizes (PSA-1, 3, 10, 35, & 100) and compensating struts (PSB-.05 & .12) the as-found stroke position shall be preserved whenever possible through proper handling techniques prescribed during the snubber training program. For snubber sizes 35 and 100 as well as all sizes of compensating struts, the unit shall be kept in the horizontal position as much as possible during removal and transit to the test bench. This is required because when held in a vertical or inclined position the weight of the indicator tube is sufficient to cause some movement which introduces a degree of error into the true as found stroke position. The same removal requirements shall apply to replacement hydraulic snubbers as applicable to the size of mechanical snubber which was replaced. 9

It is preferable to remove snubbers from the pipe as a unit from pin to pin. If this is not practical on larger units, one of the following alternatives shall be used:

1) If an extension piece is left in place on the pipe or rear end bracket, a safety impact walkdown must be performed in accordance with Spec. M-1037 to determine that damage to any safety related equipment during an earthquake is not possible. Documentation of the walkdown shall be in accordance with MFP-QA-2200.

2) If safety related equipment can be potentially damaged by the extension piece, it must be tied off with appropriately sized slings. A minimum factor of safety of 5 shall be used for sling sizing. Slings and tie-off points must be adequate to support any deadweight plus dynamic loads that may be generated.

If the snubbers are being removed for testing on a line which is required to be operable at the time of testing, the extension piece cannot remain in place on the pipe without reevaluation by Nuclear Design Engineering.

Any questions related to the implementation of this requirement shall be directed to Nuclear Design Engineering – Civil/Structural Group.

The ISI procedures for reinstalling snubbers and compensating struts shall incorporate the applicable sections of Reference 3.4. In addition, the ISI procedure shall assure that the reinstallation is correct. As a minimum, the following shall be checked:

a) Correctness of the general configuration (snubber ends not reversed from the as found condition).

b) Proper cold setting obtained.

c) Proper pipe clamp and orientation obtained.

d) Proper "S" and "G" dimensions maintained. Refer to Spec. M-1067 Appendix B for guidance.

e) Proper spacer/washer size installed. Refer to Spec. M-1067 Appendix B for guidance.

f) Proper swing angle clearance at the end bracket. Refer to Spec M-1067 Section 4.2.7.3 for guidance.

ISI shall verify snubber and compensating strut reinstallation.

4.1.1 Decontamination Activities

When required, snubber and compensating strut decontamination shall be done only by individuals who have been trained in the proper care and handling of snubbers and compensating struts. The preferred decontamination method is a gentle wipe down using a decon agent (Touch-It-Up) and a lint free cloth. Using excessive amounts of the decon agent

such that it can enter the internal mechanism of a snubber or compensating strut should be avoided as this may lead to testing failures.

*** CAUTION ***
It is not permitted to decon using high pressure water methods.

The snubbers or compensating struts shall not be stroked when performing any required decontamination as this invalidates the as found breakaway force testing. If a snubber or compensating strut cannot be sufficiently decontaminated without removing the mechanism which preserves the as found condition, the Nuclear Design Engineering-Civil/Structural Design Group shall be notified prior to mechanism removal. | 9

4.2 FUNCTIONAL TESTING REQUIREMENTS

The test procedures developed and testing equipment used shall be able to fulfill the requirements contained herein for all safety-related mechanical snubbers, hydraulic snubbers and compensating struts. Testing shall be performed on the snubbers and compensating struts in their "as found" condition to the fullest extent practical regarding the features to be tested. The as-found condition means that if the snubber is installed with an extension piece, it must be tested that way. If the extension piece exceeds the maximum length allowed by the test machine, an alternate extension piece must be installed. This alternate extension piece, when attached to the snubber, must create a unit with a pin to pin dimension equal to the maximum machine testable length (tolerance = 6"). Test methods employed must not alter the condition of the snubber or compensating strut to the extent that the results are not representative of the as-found condition prior to the test. | 9

PSA-1/4 and PSA-1/2 snubbers which are oriented vertically (within +/- 5 degrees) may be treated as an exception to the above requirement and tested without the extension pieces attached. However, if vertically oriented snubbers from the initial test sample are tested without extension pieces, the initial test sample must also contain non-vertical PSA-1/4 and PSA-1/2 snubbers which are tested with extension pieces.

4.2.1 Breakaway Force Test

a. Snubbers - The test program shall determine snubber breakaway force in tension and compression. A single breakaway force test in tension and compression is required. The test equipment used shall have the capability to record the breakaway value encountered. It is unacceptable to merely state that the breakaway force is "greater than" the maximum scale value. This test shall be conducted on the snubber in its as found condition.

b. Compensating Struts - The breakaway force testing requirement for compensating struts is the same as that for snubbers.

4.2.2 Activation Level Test

a. Mechanical Snubbers - Since activation is acceleration sensitive, the test program shall determine the threshold acceleration level of the snubber when it is exposed to a sustained load in both the extension and retraction modes. An acceptable method is to plot velocity vs. time from which the required acceleration data can be derived. For all sizes of inservice snubbers, the sustained load applied during this test shall be within a range of 80% to 100% of rated load. For new, spare or rebuilt snubbers, the sustained load shall be within a 90% to 100% range. Rated load is the Level A & B load capacity of the snubber (See Section 4.4). The test shall be initiated with the snubber extended to the approximate mid-stroke position. Precautions shall be taken to preclude snubber damage by over-extension (or over-retraction) while performing this test. 9

Hydraulic Snubbers – Since activation is velocity sensitive, the test program shall determine the threshold velocity level of the snubber when it is exposed to a sustained load in both the extension and retraction modes. Following activation, slowly increase the load until 80% to 100% of rated load is reached for inservice snubbers. For new, spare or rebuilt snubbers, the load must be 90% to 100% of rated load. Rated load is the Level A & B load capacity of the comparable Pacific Scientific Snubber (See Section 4.4). Maintain this load for approximately one minute and record the bleed rate velocity. The test shall be initiated with the snubber set at approximately 1 ½" from fully retracted for the extension test and approximately 1 ½" from the fully extended position for the compression test. Precautions shall be taken to preclude snubber damage by over-extension (or over-retraction) while performing the test. 9

b. Compensating Struts - The test program shall determine if the compensating strut locks up when exposed to the specified activation level parameters of force and time. This test shall be conducted for both the extension and retraction modes at the approximate mid-stroke position.

The test machine shall be set up such that a displacement of at least 0.050" is applied to the compensating strut in 0.030 seconds or less. Verification of this requirement shall be made by examining the displacement vs. time plot obtained during the test.

Note: The displacement vs. time plot must be reconciled to account for the lag that occurs between the time the data acquisition system is activated and the time the load cylinder is directed to move. This is done by choosing test time zero to be the point where observable displacement is first detected on the output plot. When the test load is at approximately 80% of rated load, this lag is about 10-15 milliseconds.

An input load of approximately 80% of rated load shall be used for this test. After completion of this test, DO NOT release the load (See Post Activation Displacement Test Section 4.2.3b).

The following data plots shall be output for this test:

Plot #1: Load and displacement for the interval from zero time to 60 milliseconds. Timing marks shall be at 5 milliseconds.

Plot #2: Load and displacement for the interval from zero time to 500 milliseconds. Timing marks shall be at 50 milliseconds.

4.2.3 Post-Activation Displacement Test

a. Snubbers - This test is not applicable to mechanical or hydraulic snubbers. 9

b. Compensating Struts - The test program shall determine the post-activation displacement of the compensating strut while being exposed for a period not less than 60 seconds to a continuous load equal to the rated load for the size of compensating strut being tested. Rated load is the level A & B load capacity of the compensating strut (See Section 4.4). This test shall be conducted in both the extension and retraction modes at the approximate mid-stroke position.

After lock-up has been achieved during the activation test, increase test machine cylinder pressure until the rated load of the compensating strut is reached. Loads slightly in excess of the rated load are permitted.

The test operator shall then verify that this load has been continuously applied to the compensating strut for at least 60 seconds.

The following data plot shall be obtained for this test:

Plot #3: Last time interval showing maximum load applied to the strut. Timing marks are arbitrary.

4.2.4 Running Drag Force Test

a. Snubbers - The test program shall determine snubber peak running drag force in both the extension and retraction modes. The test equipment used shall have the capability to record the peak value encountered and its location in the stroke. It is unacceptable to merely state that the peak running drag force is 'greater than' the maximum scale value. In addition, average running drag force shall be recorded for information only.

The snubber shall be extended and retracted through its total travel less 0.5 inches from each extreme position while continuously recording drag force. The velocity at which this test is conducted shall be in accordance with the following:

Snubber sizes 1/4 through 10 - 4.7 inches/minute maximum
Snubber sizes 35 and 100 - 2.4 inches/minute maximum
Lisega Hydraulic Snubber (all sizes) - .5 inches/minute maximum 9

Precautions shall be taken to preclude snubber damage by over-extension (or over-retraction) while performing this test.

b. Compensating Struts - The running drag test requirements for compensating struts are the same as for snubbers except that the velocity of the test shall not exceed 2.4 inches/minute for all sizes of compensating struts.

4.3 SEQUENCE OF REQUIRED TESTS

Unless approved by Nuclear Design Engineering-Civil/Structural Design, the sequence of required functional tests shall be as follows: 1 9

a. Inservice Snubbers -
   1. As-found breakaway force test
   2. Activation level test
   3. Running drag force test

b. Inservice Compensating Struts -

   1. a) Breakaway force (tension)
      b) Breakaway force (compression)
   2. Activation level (tension)
   3. Post-activation displacement (tension)
   4. Activation level (compression)
   5. Post activation displacement (compression)
   6. a) Running drag (tension)
      b) Running drag (compression)

c. Spare Snubbers -

   1. Running Drag force test
   2. Activation level test
   3. Running drag force test

d. Spare Compensating Struts -

   Spare compensating struts shall have an initial running drag test in tension and compression followed by sequence 2 through 6 as defined in 4.3.b above.

All of the required tests for snubbers shall be done in the extension and retraction modes. It does not matter which mode is run first.

If an inservice snubber or compensating strut fails one of the required tests, all remaining tests shall still be conducted unless physically impossible to complete (i.e., locked or broken snubber). If an inservice snubber or compensating strut is found in a locked-up condition, the as found breakaway force test shall be continued until the snubber (or compensating strut) breaks free or until the rated load of the snubber is reached.

If a spare snubber or compensating strut fails one of the required tests, all remaining tests need not be performed.

If the snubber activation level test meets the acceptance criteria specified in Section 4.4.2.a, but the applied sustained load is below that specified in Section 4.2.2, the test may be immediately repeated at the correct sustained load before proceeding to the running drag tests. 9

No other tests may be repeated or altered in any way without the approval of Nuclear Design Engineering-Civil/Structural Design. 9

4.4 FUNCTIONAL TEST ACCEPTANCE CRITERIA

To be classified as OPERABLE, all compensating struts, mechanical snubbers and hydraulic snubbers selected for testing must satisfy the functional test acceptance criteria stated in this section. 9

4.4.1 Breakaway Force Acceptance Criteria

a. Snubbers - The breakaway force shall not exceed the values shown in Table 1.

TABLE 1
SPECIFIED MAXIMUM SNUBBER BREAKAWAY FORCE

Snubber Size		Rated Load (lbs.)	2% Breakaway Force (lbs.)	4% Breakaway Force (lbs.)
PSA	Lisega			
1/4	301856RF1	350	N/A	14
1/2	301856RF2	650	N/A	26
1	303856RF1	1500	30	60
1L	303956RF1	1487	30	60
3	305253RF3	6000	120	240
3L	305353RF3	6000	120	240
10	306256RF3	15,000	300	600
10L	306356RF3	14,400	300	600
35	307256RF3	50,000	1000	2000
35L	307356RF3	50,000	1000	2000
100	309253RF3	120,000	2400	4800
100L	309353RF3	120,000	2400	4800

9

NOTE: For sizes 1/4 and 1/2, breakaway force is always considered as 4% of the rated load. Rated load is based on the Level A & B load condition as defined in Section III, Subsection NF, of the ASME Boiler and Pressure Vessel Code. Rated loads are based on Pacific Scientific snubbers. Lisega snubbers have the same or higher rated loads. The allowable breakaway force is based on the PSA values since they are the bases of the piping analyses. Only the snubbers identified in Tables 1A and 1B below are required to meet the 2% breakaway force acceptance criteria (all remaining snubbers shall meet the 4% breakaway force acceptance criteria): 9

TABLE 1A
UNIT #1 SNUBBERS
(Total of 26)

DBB-109-H16	DLA-102-H2
DBB-109-H25	DLA-102-H8
DCA-102-H2	DLA-102-H9
DCA-102-H3	DLA-102-H11
DCA-111-H9	DLA-102-H12
DCA-111-H11	DLA-102-H14
DCA-111-H12	GBC-101-H242
DCA-111-H14	GBC-101-H247
DCA-111-H29	HBB-101-H2
DCA-111-H37	HBB-108-H1
DCA-111-H40	MST-022-H36 (2 snubbers)
DLA-101-H4	SP-DCA-102-H10 (2 snubbers)

TABLE 1B
UNIT #2 SNUBBERS
(Total of 18)

DBB-209-H16	SP-DBA-212-H2602
DCA-202-H3	SP-DCA-202-H10
DCA-202-H4	SP-DCA-202-H21
DLA-203-H3	SP-DCA-202-H23
GBC-201-H242	SP-DCA-202-H2600
GBC-201-H247	SP-DCA-210-H5006
GBC-201-H248	SP-DCA-245-H2615
HBB-208-H3	SP-DCA-245-H5001
MST-222-H36 (2 snubbers)	

A representative sample from this population shall be included in the overall test sample.

b. Compensating Struts - The breakaway force shall not exceed the values shown in Table 2.

TABLE 2

SPECIFIED MAXIMUM COMPENSATING STRUT BREAKAWAY FORCE

Compensating Strut Model	Rated Load (lbs.)	Breakaway Force (lbs.)
PSB .05	50,000	750
PSB .12	120,000	1200

NOTE: Breakaway force is 1.5% of the rated load for a PSB .05 and 1% for a PSB .12. Rated load is based on the Level A & B load condition as defined in Section III, Subsection NF, of the ASME Boiler and Pressure Vessel Code.

4.4.2 Activation Level Acceptance Criteria

a. Mechanical Snubbers - Threshold acceleration shall be less than or equal to 0.04g when the snubber is subjected to sustained rated load. 9

The following snubbers are an exception to the above criteria. These snubbers must meet a threshold acceleration limit of .02g or less when subjected to sustained rated load.

Unit #1 Snubbers	Unit #2 Snubbers
DBA-101-H8	SP-DBA-212-H2602
DBA-101-H9	SP-DBA-212-H2616
DBA-101-H10	SP-DBA-212-H2650
DBA-101-H15	SP-DCA-245-H2608
DBA-101-H19	SP-DCA-245-H2615
DBA-101-H20	SP-DCA-245-H5001
DBA-101-H21	
DCA-111-H14	
SP-DBA-112-H11	
SP-DBA-112-H46	
SP-DBA-112-H28	

A representative sample from this population shall be included in the overall test sample.

Hydraulic Snubbers:

Lockup velocity shall be 5.0 IPM $\leq V_L \leq$ 14.0 IPM
Bleed rate velocities shall be 0.5 IPM $\leq V_B \leq$ 4.5 IPM
Where:
V_L = Lockup velocity
V_B = Bleed rate velocity

9

b. Compensating Struts - The compensating strut shall lock when subjected to a load of 10 percent (or greater) of the rated load. This load shall be applied within .030 seconds.

Data Plots #1 and #2 shall be used to verify and document activation level acceptance (or rejection). Perform the following:

a) On Plot #1, verify that the test machine applied a displacement of at least 0.050" in 0.030 seconds or less. (See Note under Section 4.2.2.b Activation Level Test regarding time lag). The 0.030 second interval shall be marked on Plot #1.

b) Using Plot #1, verify that the strut activated in the marked 0.030 second interval. Activation is defined as the point at which the strut begins to sustain load.

c) Using Plot #1, verify that the strut sustained at least 10% of the rated load in the marked 0.030 second interval.

d) Using Plot #2, verify that the strut activates and is sustaining the input load without displacement.

If a) through d) are satisfied, then the compensating strut passed the activation level acceptance criteria.

Satisfaction of all the above items except c) may not necessarily indicate an activation level failure. Forward these cases to the Civil Structural Design Group for further evaluation. 9

4.4.3 Post-Activation Displacement Test Acceptance Criteria (Compensating Struts Only)

Post-activation displacement must be essentially zero. The strut must remain locked until the applied load is removed.

The test machine operator is responsible for verifying that this criteria has been met. Plot #3 shall be used to document the results of this test. This plot will show the maximum load achieved during the test. Values for the maximum applied load shall be read from the load vs. time plot or from the numeric values printed out.

The applied load must be at least equal to the rated load of the strut. The test operator shall initial and date Plot #3 to document that this load was applied and sustained by the strut for at least 60 seconds.

4.4.4 Running Drag Test Acceptance Criteria

a. Snubbers - The measured peak running drag force shall not exceed the values shown in Table 3.

TABLE 3

SPECIFIED MAXIMUM SNUBBER PEAK RUNNING DRAG FORCE

Snubber Size PSA	Snubber Size Lisega	Rated Load (lbs.)	2% Peak Running Drag Force (lbs.)	4% Peak Running Drag Force (lbs.)
1/4	301856RF1	350	N/A	14
1/2	301856RF2	650	N/A	26
1	303856RF1	1500	30	60
1L	303956RF1	1487	30	60
3	305253RF3	6000	120	240
3L	305353RF3	6000	120	240
10	306256RF3	15,000	300	600
10L	306356RF3	14,400	300	600
35	307256RF3	50,000	1000	2000
35L	307356RF3	50,000	1000	2000
100	309253RF3	120,000	2400	4800
100L	309353RF3	120,000	2400	4800

9

NOTE: For sizes 1/4 and 1/2, peak running drag force is always considered as 4% of the rated load. Rated load is based on the Level A & B load condition as defined in Section III, Subsection NF, of the ASME Boiler and Pressure Vessel Code. Rated loads are based on Pacific Scientific snubbers. Lisega snubbers have the same or higher rated loads. The allowable peak running drag force is based on the PSA values since they are the bases of the piping analyses. Only the snubbers identified in Tables 1A and 1B herein are required to meet the 2% peak running drag force acceptance criteria (all remaining snubbers shall meet the 4% peak running drag force acceptance criteria). 9

b. Compensating Struts - The measured peak running drag force shall not exceed the values shown in Table 4.

TABLE 4

SPECIFIED MAXIMUM COMPENSATING STRUT PEAK RUNNING DRAG FORCE

Compensating Strut Model	Rated Load (lbs.)	Peak Running Drag Force (lbs.)
PSB .05	50,000	750
PSB .12	120,000	1200

NOTE: Peak running drag force is 1.5% of the rated load for a PSB .05 and 1% for a PSB .12. Rated load is based on the Level A & B load condition as defined in Section III, Subsection NF, of the ASME Boiler and Pressure Vessel Code.

4.4.5 Miscellaneous Anomalous Data Acceptance Criteria

Snubbers or compensating struts which do not meet the acceptance criteria of Sections 4.4.1 through 4.4.4 are classified as inoperable. It is recognized, however, that certain test results may be subject to interpretation when attempting to determine if the required acceptance criteria has been met. In addition, the testing vendor may flag certain snubbers or compensating struts via a Notice of Anomaly simply because they have noted 'erratic motion' even though the unit may meet the required acceptance criteria.

To avoid confusion, all anomalous test results will be reviewed by the ISI Supervisor or designated alternate who will determine if the unit tested should be classified as a valid failure. Application of technical acceptance criteria above and beyond that stated in the previous sections of this specification, shall be performed on a case-by- case basis. "Anomalous units" determined to be non-failures will not require an increase in the required testing sample sizes. "Anomalous units" determined to be valid failures will require the generation of an Engineering Work Request (EWR) for disposition. The EWR will state the specific reason for rejection and the required engineering evaluation as determined by the ISI Supervisor or designated alternate.

4.5 DEGRADED SNUBBERS

Tested snubbers which meet the acceptance criteria of Section 4.4 but do not meet the criteria of Section 4.5.1 are classified as degraded. These snubbers are not failures as far as TRM requirements are concerned. The degraded category is to identify snubbers which should receive some special actions which may prevent future TRM related failures of this category of snubbers.

4.5.1 Degraded Snubber Criteria

Snubbers are classified as degraded if they meet the acceptance criteria of Section 4.4 but exceed any of the criteria listed below.

Breakaway and Drag Force Criteria

The maximum breakaway and peak drag force shall not exceed the following:

Snubber Size		2% Allowable Breakaway/Drag Force (lbs.)	4% Allowable Breakaway/Drag Force (lbs.)
PSA	Lisega		
1/4	301856RF1	N/A	11
1/2	301856RF2	N/A	21
1	303856RF1	24	48
1L	303956RF1	24	48
3	305253RF3	96	192
3L	305353RF3	96	192
10	306256RF3	240	480
10L	306356RF3	240	480
35	307256RF3	800	1600
35L	307356RF3	800	1600
100	309253RF3	1920	3840
100L	309353RF3	1920	3840

9

Activation Level Criteria

Mechanical Snubbers:

1 9

Threshold acceleration shall not exceed .032g.

Hydraulic Snubbers:

9

Lockup velocity shall be 6.0 IPM $\leq V_L \leq$ 12.0 IPM
Bleed rate velocities shall be 0.8 IPM $\leq V_B \leq$ 4 IPM

4.5.2 Notification of Degraded Snubbers

The testing vendor shall maintain a list of all degraded snubbers (snubber problem list). Notices of Anomalies (NOA's) shall not be generated. The vendor is responsible for notifying PPL of degraded snubbers within 3 hours after determining a degraded condition. When practical, verbal notification shall be made to the ISI Supervisor or designated alternate. An updated copy of the snubber problem list shall be given to the ISI Supervisor or designated alternate whenever additional degraded snubbers are identified. | 9

4.5.3 Actions Regarding Degraded Snubbers

The testing vendor shall notify PPL of the degraded snubber per Section 4.5.2. The ISI Group will decide if a spare snubber should be used to replace the degraded one. This decision may depend on the quantity of spares available as well as the outage window time constraints regarding removal, test, and reinstallation. In no case shall this decision hold up a snubber reinstallation. The testing vendor will be informed by the ISI Group regarding the decision. If the vendor is not informed regarding a degraded snubber he may assume that it is to be reinstalled. | 9

When practical and if time permits, the testing vendor should disassemble, clean and/or repair a degraded snubber in accordance with the Pacific Scientific or Lisega approved procedures. After reassembling, test the snubber in accordance with Sections 4.2, 4.3 and 4.4. If the snubber is no longer classified as degraded per the results of this test, it may be reinstalled. | 9

The ISI Supervisor or designated alternate shall be kept informed of all disassembly, cleaning, repair and retest activities regarding degraded snubbers. The degraded snubber listing discussed in Section 4.5.2 shall indicate these actions and their results. | 9

4.6 REPLACEMENT SNUBBERS AND COMPENSATING STRUTS

Snubbers and/or compensating struts classified as failures shall be replaced by new, spare or rebuilt units. The replacement snubber or compensating strut shall be functionally tested per Section 4.2 and 4.3 of this specification prior to installation. The acceptance criteria for the replacement units shall be in accordance with Section 4.4 of this specification.

The ISI Group is responsible for initiating a change to the Component Management Database of NIMS whenever a replacement snubber is installed. The database will be updated to reflect the replacement snubber's serial number.

4.7 FAILURE ANALYSIS REQUIREMENTS

Snubbers and/or compensating struts which fail the acceptance criteria stated herein shall have a failure analysis performed on them by an individual with sufficient experience to do such an analysis. This analysis may be done by a Vendor, a designated alternate or by PPL. PPL shall determine "sufficient" experience based on personal qualifications as represented in resumes, certifications, and any supporting documentation provided by a testing vendor. This analysis may be done after the outage is over if the results of the analysis are not needed to make decisions during the outage regarding operability, sample size, etc. The results of these analyses shall be recorded on a separate failure analysis data sheet and must contain the following as a minimum: | 9

a. Hanger mark number.
b. Size.
c. Serial number.
d. Failure analysis results (teardown description).
e. Possible cause of failure.
f. Signature of individual performing the analysis.
g. Date of performance.

(A sample of an acceptable data sheet is given in Appendix B.)

These failure analysis data sheets shall be maintained as official records by SSES Document Control Center such that they can be easily retrieved for historical reference.

4.8 DOCUMENTATION REQUIREMENTS

The Contractor supplying services shall submit a test program report to PPL for review and approval prior to commencing work. The program outline shall include all test procedures necessary to satisfy the requirements of 4.2. 9

Test results shall be documented in a format approved by PPL and in accordance with 1.3.2. All test results shall be submitted to PPL upon completion of testing. 9

The ISI Group shall interface with Civil/Structural Design Group by providing the following:

1. Engineering Work Request (EWR)

   An EWR shall be generated for each snubber failure and consist of the following as a minimum:

   a. Hanger mark number
   b. NOA number
   c. Copy of the vendor's test data package
   d. Response date based on the current outage schedule

   An advanced copy of the approved EWR shall be telecopied to the Civil/Structural Design Group within 1 working day after the vendor's notification of failure. This time frame is dependent on the outage's schedule of system restoration and may need to be reduced at times. 9

   The Civil/Structural Design Group requires a minimum of 24 hours to perform an engineering evaluation. This time frame is dependent on the outage's schedule of system restoration and may need to be reduced at times. 9

2. ISI Snubber Report

   The report shall be provided to the Civil/Structural Design Group and consist of the following as a minimum: 9

a. Snubber testing status including number tested, number passed, and number failed (in each snubber category).
b. Current list of EWR's transmitted to the Civil/Structural Design Group including hanger mark number, size, and serial number. | 9

3. Listing of Tested Snubbers

An updated list shall be provided to the Civil/Structural Design Group and consist of the following as a minimum: | 9

a. Hanger mark number
b. Size
c. Serial number - if snubber is part of a double snubber arrangement.
d. Indication of pass or fail.

4. ISI Snubber Tracking Program

The computer print-out shall be provided to the Civil/Structural Design Group prior to the outage and consist of the following as a minimum: | 9

a. Hanger mark number
b. Size
c. Serial number
d. System description
e. Origin code
f. Snubber reduction code (if applicable)
g. System number

5. Outage Schedule

The outage schedule shall be provided to the Civil/Structural Design Group prior to the outage. Any revision of the schedule made during the outage shall also be provided (written or verbal). | 9

6. Failure Analysis Sheets

The failure analysis sheets shall be provided to the Civil/Structural Design Group upon completion of the outage. | 9

7. Notice of Anomaly Log

The Notice of Anomaly log shall be provided to the Civil/Structural Design Group upon completion of the outage. | 9

8. Degraded Snubber Log

The degraded snubber log shall be provided to the Civil/Structural Design Group upon completion of the outage. | 9

5.0 TESTING AND INSPECTION

The ISI Group is responsible for surveillance of the testing contractor. The schedule/frequency of surveillance is at the discretion of the ISI supervisor. All test results shall be supplied to and maintained by PPL in the approved format referenced above in Section 1.3.2. | 9

6.0 PREPARATION FOR DELIVERY

This section is not applicable to this specification.

7.0 QUALITY ASSURANCE PROGRAM REQUIREMENTS

For PPL internal use of this specification, the Quality Assurance Program Requirements shall be as required by the scope of Operational Policy Statement-1. | 9

For use external to PPL, the Quality Assurance Program requirements shall be as required in the purchase documents or contracts and specifications for the material/services. | 9

All testing performed per this specification is designated as nuclear safety-related and requires a high level of control and documentation.

For all testing performed under this specification, the Contractor is required to comply with the requirements of this and other applicable specifications, and related detailed procedures such as health physics, security, etc.

The testing shall commence only after the Contractor has received the Owner's final approval of its procedures, personnel, testing and failure analysis certifications, and other supporting documents. The Contractor shall submit a controlled copy of its procedures to the Owner within 30 days after date of award. (Any extension of this 30-day period must be approved in writing by the Owner in response to the Contractor's written request justifying the extension requested.) After Owner's approval, changes to the Contractor's procedures must be submitted to the Owner for approval prior to their use by the Contractor.

Acceptance of the Contractor's procedures does not relieve the Contractor of the obligation for compliance to the requirements of the procurement documents included with this specification. If the procedures are found to be ineffective or inadequate to provide acceptable control subsequent to their acceptance, the Owner reserves the right to require necessary revisions.

The Contractor shall submit its quality control documentation to the Owner.

The Contractor shall agree to the Owner's right to audit and inspect all documentation and work performed at the plant site and any supporting documentation provided from their home office.

APPENDIX B

SAMPLE DATA SHEET FOR FAILURE ANALYSIS

The following is an acceptable data sheet which may be used to comply with Section 4.7 of this Specification.

MECHANICAL SHOCK ARRESTOR (SNUBBER)
FAILURE ANALYSIS REPORT

DATE: _____ HANGER NO.: _____

SIZE: _____ S/N: _____

CHECK WITH THE RADIATION SURVEY METER: __ SAFE __ UNSAFE

DISCREPANCY REPORTED BY CUSTOMER: _____

VISUAL INSPECTION: _____

DISCREPANCY FOUND: TESTED PER SPEC. NO. _____

FAILURE ANALYSIS (TEARDOWN): _____

CAUSE: _____

BY: _____ TITLE: _____

M-1090(32)

Attachment 3 to PLA-5753

NEPM-QA-0595, Rev. 3

PROCEDURE COVER SHEET

PPL SUSQUEHANNA, LLC PROCEDURE	
SNUBBER PROGRAM ADHERENCE LEVEL: INFORMATION USE	10/27/03 NEPM-QA-0595 Revision 3 Page 1 of 37

QUALITY CLASSIFICATION:	APPROVAL CLASSIFICATION:
(X) QA Program ( ) Non-QA Program	(X) Plant ( ) Non-Plant ( ) Instruction

EFFECTIVE DATE: _____

PERIODIC REVIEW FREQUENCY: N/A

PERIODIC REVIEW DUE DATE: N/A

RECOMMENDED REVIEWS:

Procedure Owner: John E. Lines

Responsible Supervisor: Supervisor-NDE-SSES

Responsible FUM: Manager-Nuclear Design Engineering

Responsible Approver: Manager-Nuclear Design Engineering

PROCEDURE REVISION SUMMARY

TITLE: SNUBBER PROGRAM

1) Administrative Changes.

2) Deleted procedure reference NDAP-QA-00-1601 and renumbered.

3) Section 9.3.3.b, item 11 changed EWR to read CRA and deleted contents of item 12 and renumbered.

4) Attachment C Snubber Flowpath revised.

5) Attachment D Snubber Tracking Form Revised.

6) Attachment E Snubber Tracking Log revised.

7) Added 5.19.4 to section 5.19 of paragraph 5 Definitions.

TABLE OF CONTENTS

ATTACHMENTS

1. PURPOSE

This procedure describes PPL's Snubber Program.

NOTE: Level of Use is INFORMATION USE.

2. SCOPE

This procedure covers all snubbers and compensating struts. There are two (2) groups of snubbers, Technical Requirements Manual (TRM) or "Safety" related and Non-TRM or "Non-Safety" related.

3. REFERENCES

3.1 Unit 1/Unit 2 TR 3.7.8

3.2 NDAP-QA-1608, Inservice Inspection (ISI)

3.3 MT-099-006, Snubber Removal and Reinstallation

3.4 ST-100-001/ST-200-001, Snubber Visual Inspection

3.5 ST-100-002/ST-200-002, Snubber Functional Testing

3.6 ST-100-003/ST-200-003, Snubber Operating History Review

3.7 M-1090, Technical Specification for Inservice Testing of Safety Related Mechanical Snubbers, Hydraulic Snubbers and Compensating Struts

3.8 C-1066, Technical Specification for Inservice Testing of Non-Safety Related Mechanical Snubbers

3.9 M-1091, Procurement of Pacific Scientific Mechanical Snubbers and Compensating Struts

3.10 M-1094, Purchase of Pipe Support Components for Replacement and Modification

3.11 NDAP-QA-0722, Surveillance Testing Program

3.12 NDAP-QA-0702, Action Request and Condition Report Process

3.13 MT-AD-522, Rework, Repair and Replacement of ASME Code Components

3.14 NDAP-QA-0201, Material Control Activities

3.15 OPS-15, Inservice Inspection

3.16 C-1103, Technical Specification for Structural Integrity Requirements for Piping Systems

3.17 NEIM-00-1161, Surveillance of ISI Contractors

3.18 NEIM-00-1160, Snubber Functional Testing Data Review Program

3.19 NEIM-00-1164, Snubber Visual Inspection Data Review Program

([2]) ([1]) 3.20 Audit Finding 88-066-02

3.21 NDAP-QA-0703, Operability Assessments and Requests for Enforcement Discretion

3.22 NDAP-QA-0627, Radioactive Contamination Control

3.23 MM007 - Snubber Inspection

([3]) ([2]) 3.24 NQA Audit Finding 92-050-06

([4]) ([3]) 3.25 NQA Audit Recommendation 92-111

3.26 NDAP-QA-0720, Station Report Matrix and Reportability Evaluation Guidance

3.27 ASME Code, Section XI 1989 Edition with 1990 Addenda Subsection IWF for Component Supports

3.28 PPL Inservice Inspection Manual (ISI-T-106/206 and Relief Request #3)

3.29 NDAP-QA-0502, Work Order Process

3.30 NDAP-00-1601, Engineering Work Request/Tracking

3.31 NDAP-QA-0028, Document Submittals, Copyright Compliance and Document Access and Release Program

3.32 NDAP-QA-1214, Nuclear Department Program for ASME Code Section XI Repairs and Replacements and National Board Inspection Code Repair and Alterations.

4. RESPONSIBILITIES

4.1 The Manager Nuclear Design-Engineering has overall responsibility for the requirements of this procedure.

4.2 The Manager-Nuclear Maintenance is responsible for providing the trained work force and the tools to perform the physical work required by the Snubber Surveillance procedures. In addition, he is responsible for confidence checks of Measuring and Test Equipment (M&TE) and wrenches with Maintenance Usage Logs for both. He is also responsible for ensuring Work Group Supervisor approval of snubber work documents.

4.3 The Supervisor-NDE-SSES (or his designee) is responsible for implementation of the Snubber Program. He is responsible for providing qualified inspectors to perform the inspection verification and documentation required by this procedure. He is responsible for reviewing the "representative (initial) sample."

4.4 Supervisor Civil/Structural Design Group (or his designee) is responsible for interpretation of failure analysis, he also will analyze the effect of failed installed snubbers on piping and supports or as required by Station Engineering.

4.5 Manager- Station Engineering (or his designees) is responsible for dispositioning Condition Reports (CR's) related to support damage, component operability, and hanger settings which require engineering level evaluations. He is responsible for piping structural integrity (C-1103) evaluations.

4.6 The Manager Quality Assurance is responsible for providing qualified inspectors to perform the inspection, verification, and documentation required for modification activities.

4.7 Snubber Data Reviewer is responsible for snubber functional testing data review, concurrence, logging, tracking and data distribution. Responsible for the generation of Snubber Tracking Forms and Logs with the generation of Work Orders (as needed).

4.8 The ISI Group/Snubber Program Coordinator is responsible for coordination of the Snubber Program. Included in this responsibility is prioritizing and assigning snubber inspection and functional testing work, interpreting Snubber functional and visual test/exam data provided by the testing/inspection vendor, obtaining spare snubbers to replace those that fail to meet the criteria defined in the inspection/testing programs, generating AR-CR reports, and processing of all records generated as a result of this procedure. Responsible for signature approval of Snubber Inspection Checklist/Signoff Sheets. Ensures a ZWO is generated holding a system inoperable until an engineering evaluation for failed snubbers is in place prior to signing the Snubber Inspection Checklist/Signoff Sheet. The Snubber Program Coordinator is also responsible for tracking the status of the inspection program from the time a snubber is assigned for inspection until the inspection and rework, repair, or replacement is completed.

5. DEFINITIONS

5.1 Technical Requirements Manual (TRM) or "Safety Related" Snubber - Snubbers on Q piping and Non-Q piping from the Q boundary valve to the anchor. The snubbers are functionally tested and visually inspected to SSES Specification M-1090. The Technical Requirements Manual of the respective Unit covers these snubbers.

5.2 Non-Technical Requirements Manual or "Non-Safety Related" Snubbers - Snubbers located on Non-Q piping except as noted in 5.1. Their functional test Acceptance Criteria can be found in Specification C-1066. These snubbers are not covered by the Technical Requirements Manual of each Unit. The Technical Requirements Manual of each Unit does not cover these snubbers.

5.3 Mechanical Snubber - An acceleration sensitive device which mechanically provides restraint to a component or system during a sudden application of abnormal forces but allows free motion during normal thermal movement. Acceleration is maintained at the design threshold without locking, hence the mechanical snubber will not become locked in a fixed position by a sustained, uninterrupted force.

5.4 Mechanical Compensating Strut - An acceleration sensitive device which mechanically provides restraint to a component or system during a sudden application of abnormal forces but allows free motion during normal thermal movement. When the predetermined threshold acceleration is exceeded, the compensating strut locks up becoming a rigid restraint and allows no further free motion until the applied force drops to or near zero.

5.5 Snubber List - A computer sort of the information which contains a listing of snubber hanger locations required for the ISI Groups testing/ inspection.

5.6 Snubber Program Coordinator - An individual in the Nuclear Design Engineering (ISI Group) in charge of snubber inspections and testing.

5.7 Snubber Notice of Anomaly Form (NOA) - A form issued to the ISI/Snubber Test Group by the Snubber Functional Testing Contractor identifying snubber functional testing failures (per PPL Specification M-1090 or C-1066 criteria). An NOA and its attached snubber functional testing data are formal notification to PPL of a nonconforming condition. A NOA is used to generate a Condition Report and a Snubber Tracking Form.

5.8 Snubber Functional Test Anomaly - Snubber Functional Test results which indicate abnormal movement or abnormal test values. The abnormalities may or may not be snubber functional failures. An example of non-failure anomaly is non-characteristic snubber data graphs with values not exceeding specification of M-1090 or C-1066.

5.9 Snubber Tracking Form (NEPM-QA-0595-2) - A PPL form completed by the ISI Group for tracking Snubber Notice of Anomaly (NOA) failures. This form is used as a checklist to track the PPL review and action needed/taken in addressing nonconformance requirements of snubber functional testing failures.

5.10 Nonconformance - A deficiency in characteristic, documentation or procedure which renders the quality of an item unacceptable or indeterminate. Nonconformances may include: physical defects, test failures, incorrect or inadequate documentation; or failure to comply with prescribed processing, inspection or test procedures.

5.11 Operable-Operability - A system, subsystem, train, component or device shall be operable or have operability when it is capable of performing its specified function(s) and when all necessary attendant instrumentation, controls, electrical power, cooling or seal water, lubrication or other auxiliary equipment that are required for the system, subsystem, train, component or device to perform its function(s) are also capable of performing their related support function(s).

5.12 Operability Review - A determination if the condition renders plant safety systems or components INOPERABLE AND/OR places the plant in a Limiting Condition for Operation (LCO)/Technical Requirement for Operation (TRO). For installed snubbers failing their functional testing, the snubber is predetermined to be inoperable pending a pipe/hanger stress engineering evaluation. A ZWO is required on the system requiring the evaluation prior to closing the original Work Order, if that Work Order is to be closed before the Engineering evaluation is completed.

5.13 Reportability Review - A determination if the condition is reportable to the Nuclear Regulatory Commission under the provisions of 10CFR21, Reporting of Defects and Noncompliance, 10CFR50.72, Immediate Notification Requirements for Operating Nuclear Power Reactors, and 10CFR50.73, Licensee Event Report System.

5.13.1 **Determine** whether or not the use of the component identified as nonconforming may create a SUBSTANTIAL SAFETY HAZARD, or may contribute to exceeding a SAFETY LIMIT as defined in the Technical Specifications/Technical Requirements.

5.13.2 **Evaluate** the nonconforming condition against the defined reportable conditions listed in NDAP-QA-0720 Station Report Matrix and Reportability Evaluation Guidance.

5.14 Snubber Visual Inspection - The programmatic examination viewable by the human eye of snubbers to ensure compliance to the Acceptable Criteria of ST-100-001/ST-200-001. For the purpose of this procedure, visually observing

nonconforming conditions outside the performance of ST-100-001/ST-200-001 (Snubber Visual Inspection) does not constitute a visual inspection program failure.

5.15 Snubber Functional Inspection - A series of tests performed on a snubber test machine to measure specific Snubber operating values (Breakaway, Activation, Drag). These values are compared to PPL Specifications to determine if the snubber passes or fails. These inspections are performed in accordance with SSES Technical Specifications M1090/C1066.

5.16 Piping Structural Integrity (C-1103) - This is a specification that helps define requirements to keep a Technical Specification/ Technical Requirement required operable system from being in an un-analyzed condition.

5.17 Outage - The term outage in this procedure refers to refuel outages, system outages and forced outages.

5.18 Initial Sample Snubbers - A distinct group of snubbers chosen to meet the initial snubber functional testing required by SSES Technical Requirements Manual.

5.19 Required Snubbers - Snubbers required to be functionally tested which are not part of the representative initial sample or its contingencies. Required snubbers include:

5.19.1 Failed snubbers which are rebuilt satisfactorily and reinstalled will be tested the next testing cycle.

5.19.2 The replacement snubber for a failed snubber will be retested the next testing cycle.

5.19.3 Snubbers identified by Civil/Structural Design Group as needing functional testing (e.g., MSL Snubbers).

5.19.4 Snubbers identified to be tested for Service Life Monitoring (e.g., snubbers that have not been tested > twelve years).

5.20 Contingency Snubbers - Snubbers whose potential for functional testing is contingent on the expansion of functional exams. The exam expansion is required following the snubber functional test failures of a specific number of initial sample snubbers.

5.21 Hydraulic Snubber – A velocity sensitive device which hydraulically provides restraint to a component or system during a sudden application of abnormal forces, but allows free motion during normal thermal movement. Velocity is maintained at the design threshold without locking, hence the hydraulic snubber will not become locked in a fixed position by a sustained, uninterrupted force.

6. TOOLS AND EQUIPMENT

6.1 Snubber Test Machine - A machine that is capable of measuring the breakaway force, the activation level, and the drag values of the snubbers as they are tested.

6.2 Snubber removal and installation tools - Tools listed in Procedure MT-099-006, "Snubber Removal and Reinstallation."

7. PRECAUTIONS

7.1 All Snubbers are delicate precision mechanisms, regardless of their physical size. Do not use Snubbers for steps, hand holds, grounds for welding or rigging points. Rough handling, twisting or abuse may cause damage to the Snubbers. Snubbers subjected to rough handling/abuse as determined by the Snubber Program Coordinator will have an AR-CR Report generated to track the discrepancy.

7.2 Handling a snubber for any reason (i.e., removing one end due to its interference with another component) requires use of the Snubber Removal and Reinstallation Procedure, MT-099-006. This procedure ensures snubbers are handled correctly, minimizing possible damage and ensuring the requirements of stroke testing, tracking, and reinstallation checks occur.

8. PREREQUISITES

8.1 Visual Inspections - Snubbers shall be inspected by VT-3 certified personnel.

8.2 Functional Inspections - Persons operating Snubber Test Machines must be qualified/certified on the machine they are operating.

8.3 Personnel performing removal and reinstallation (MT-099-006) must have passed MM007 and is Task Certified.

9. PROCEDURE

9.1 General

9.1.1 For snubber functional testing; AR-CR Reports are generated when:

a. The quality of stressed hangers/piping is indeterminate as indicated by an Engineering Evaluation. This evaluation may request nondestructive examinations to the supported component(s) or hanger(S).

b. A nonconforming condition is identified during snubber removal or installation which cannot be resolved by inprocess rework.

c. Snubbers are damaged or potentially damaged in the removal/reinstallation process.

d. Snubber lockup failure is known to be from a manufacturer/design defect.

e. Unrepaired snubbers are grouped at outage end in accordance with this procedure, (Section 9.3.3.b.2 and 9.3.3.b.17).

f. A procedure is violated.

g. Rough handling, abuse (see Section 7.1).

h. AR-CR Reports are generated to control snubber functional testing failures.

Snubber Tracking Forms are generated as a checklist to help the ISI Group follow all the actions required by the AR-CR generated by Functional Test failures.

9.1.2 Contaminated Snubbers

a. All snubbers removed from the controlled zone area are potentially contaminated and are processed per the requirements of NDAP-QA-0627, Contamination Control.

b. Snubber decontamination is limited to external applications of an approved decon agent and wiping with a lint free cloth. High pressure water decon methods are not permitted.

c. When the contractor is licensed to handle contaminated materials, contaminated/potentially contaminated snubbers may be shipped offsite to a contractor facility for refurbishment. When contaminated/potentially contaminated snubbers require shipping offsite to a contractor facility without license to accept contaminated materials, the Snubber Program Coordinator may authorize disassembly for decontamination. Following decontamination the snubber is processed per the requirements of NDAP-QA-0201 and shipped to the facility.

9.2 Visual Inspection Program

9.2.1 The frequency of visual inspections for snubbers is determined by the failure rate in previous visual inspection surveillances. This frequency may be determined independently for two separate groupings of snubbers; those accessible during operation versus those inaccessible during operation. (See Attachment G.)

9.2.2 The visual inspection boundary, the specific areas of inspection within that boundary, and the criteria of acceptance for the inspection are stated in the unit specific Snubber Visual Inspection Surveillance Procedure (ST-100-001/ST-200-001). Documentation of the inspection results and calculation of future visual inspection frequency is performed while completing the ST.

9.2.3 The visual inspection data flowpath, including data review and approval and the addressing of discrepancies discovered in the inspection, is described by NEIM-00-1164, Snubber Visual Inspection Data Review Program.

9.2.4 The Snubber Visual Inspection frequency is non-routine (frequency is determined by number of failures); therefore, the STs for visual inspection are not scheduled automatically by NIMS. The ISI Group schedules future surveillances based on the results of past Visual surveillances. The due date and violation date for the next visual surveillance are calculated on a Data Form in the most recently completed Surveillance. A Surveillance Authorization (RTSV) is initiated to perform the next required Surveillance based on this calculation. (1)

9.2.5 Nonconforming conditions discovered during visual inspections are addressed by AR-CR Report and/or PCWOs depending on the type and significance of condition. Failure of ST Acceptance Criteria requires a CR. Non-ST failures without generic implications may be corrected "in-process" using the existing Visual Inspection Work Order (PCWO) or a generic "cosmetic rework" PCWO.

1.1.1 ———————————

(1) Audit Finding 88-066-02

9.2.6 Non-safety related snubbers are usually inspected during scheduled refueling outages (excludes forced outages for reduced visual inspection frequencies). Though they are inspected to the same ST criteria as safety snubbers, the failure of a non-safety related snubber has no impact on the results of the Visual Inspection ST. The dispositioning and/or correction of nonconformance's is addressed as for safety related snubbers.

9.3 Functional Testing Program

9.3.1 Selection of Snubbers for Functional Testing

a. The "representative sample" required to be functionally tested is selected by the Snubber Program Coordinator. His selection of this "representative (initial) sample" may come from those systems available early in the outage. This allows for a speedy determination of the need for additional, or "expanded" exams.

b. "Expanded" exams are selected by the Snubber Program Coordinator with consideration of system availability and outage work interferences while maintaining a "representative" perspective.

c. The Snubber Program Coordinator continually tracks and assesses the status of snubber functional testing to determine the need for expanding exams or when the functional testing requirements are met.

d. The "representative (Initial) sample" (Snubber Work Scope) shall be reviewed per NDAP-QA-0101. This review shall be performed by the Supervisor-NDE-SSES and the Supervisor Station Engineering - or his designee(s). (2)

9.3.2 Snubber Removal/Testing/Reinstallation

a. Snubber removal and reinstallation is performed in accordance with MT-099-006. The removal/ reinstallation steps performed are documented on the applicable signoff sheets in the MT. Use of MT-099-006 is not limited to snubber removal for functional testing. This MT is used for <u>any handling</u> of an installed snubber.

1.1.1 ---

(2) NQA Audit Finding 92-050-06

b. During outage testing, the snubber should have its Visual Inspection (ST-100-001/ST-200-001) completed prior to removal for functional testing (if required).

c. Functional testing of snubbers is performed per and documented by the Snubber Functional Testing Surveillance Procedure (ST-100-002/ST-200-002). The snubbers are tested to values specified by the applicable PPL Engineering Technical Specification; either M-1090, Inservice Testing of Safety-Related Mechanical Snubbers and Compensating Struts, or C-1066, Inservice Testing of Non-safety Related Mechanical Snubbers. A Contractor or a PPL employee who has been certified by the contractor performs testing. The contractor uses PPL vendor originated procedures, written to incorporate PPL's testing specifications (M-1090/C-1066). Their procedures are reviewed by PPL per NDAP-QA-0101.

d. Results of the contractor's functional testing are reviewed and approved by a PPL representative in accordance with NEIM-00-1160, Snubber Functional Testing Data Review Program.

e. The Testing Contractor notifies the ISI Group of test failures via a Notice of Anomaly (NOA), which is Attachment B of this procedure. Functional test failures are documented by a Condition Report and tracked by the ISI Group via Snubber Tracking Form, Attachment D. NDAP-QA-0702, Action Request and Condition Report Process address all other nonconforming conditions occurring during functional testing.

f. Snubbers which pass functional testing, but are not installed due to being "degraded" (close to failure as specified by PPL specifications M-1090/C-1066) or as requested by the Snubber Program Coordinator are noted on a Snubber Change Notice Form (Attachment A) by the Contractor Test Group. A tag is attached to inform personnel of the degraded condition. Since degraded snubbers have passed their functional testing, they may be stored with other snubbers passing functional testing. They do not generate an AR-CR for nonconformance control, engineering evaluations, or ZWOs for system status control.

g. When installing a spare snubber, the Snubber Program Coordinator ensures the spare snubber has documentation of acceptable functional testing. For snubbers whose acceptable functional test results are greater than twelve (12) months old, the Snubber Program Coordinator also ensures a stroke test (freedom-of-motion) is performed on the snubber prior to/or during installation, and a Material Request/Issue 78 Form (NDAP-QA-0201-4) is completed. White original sheet is placed in WO package and yellow/pink copies are sent to the Warehouse Snubber Controller.

h. Replacement of installed snubbers requires initiation of a Snubber Change Notice Form (Attachment A) by the responsible group and when applicable a MT-AD-522-1 Form, NIS -2 Form, and a change to NIMS database by the ISI Group.

i. The Snubber Functional Testing Program is considered a non-routine surveillance and is not automatically scheduled by NIMS. The ISI Group schedules functional testing via Surveillance Authorizations (RTSV), per NDAP-QA-0722. (1)

9.3.3 Snubber Functional Failure and their Nonconformance Tracking

a. Snubber Functional Test Failures are nonconformances. During non-outage conditions, the requirement to functionally test a snubber results from the disposition of another nonconforming event, i.e., visual indications of damage. This event is an AR-CR as described by NDAP-QA-0702, Action Request and Condition Report Process.

1.1.1 ---

(1) Audit Finding 88-066-02

b. The Snubber Functional Testing Failures occurring during outages are nonconformances. These outage functional test failure nonconformances are controlled as follows:

(1) When a Snubber Functional Test Failure is determined by the Snubber Functional Testing Contractor, he/she prepares a Snubber Notice of Anomaly, (NOA), (Attachment B). The NOA is the formal identification/notification of a snubber functional test failure/anomaly to the ISI Group. The NOA includes at a minimum, information to identify the failed snubber, the type of failure, the Testing Specification not met, a summary of the test failure results, the test number and a sequential NOA number corresponding to the functional test failure for that outage.

(2) The Snubber Functional Testing Contractor tags the failed snubber with an NOA tag (Attachment B) to prevent the snubber being reused. If snubbers are stored in containers, a tag for each stored snubber may be applied to outside of container (i.e., LSA box). The NOA tag contains information identifying the snubber ID, the NOA number, and information to identify it as a failure (such as "Quality Assurance Reject," etc.). The NOA tag remains with the snubber until the snubber is either:

(a) Retested and passes

(b) Rebuilt, retested and passes

(c) Scrapped

(d) Marked "for training only"

(e) Addressed and tagged by a CR

(f) Selected for use in location of C-1066 specification snubber (and passes C-1066 Criteria)

NOA tags may be altered or removed only by or with the permission of the ISI Group. An individual removing an NOA tag signs for its removal on the Snubber Tracking Form.

(3) The failed snubber is physically segregated from "passing" snubbers by using a specific laydown area for failed snubbers. This area is predetermined before the outage by the Snubber Program Coordinator. Segregation of the snubber will remain in effect until the snubber is either:

(a) Retested and passes

(b) Scrapped

(c) Marked "for training only"

(d) Addressed and tagged by a CR consolidating snubber failures at outage end

(e) Selected for use in location of C-1066 specification snubber (and passes C-1066 Criteria)

Degraded snubbers are not nonconforming snubbers and are not stored in this laydown area.

(4) The Snubber NOA and the Test Data Information initiating the NOA (to include Forms ST-100-002-2 or ST-200-002-2) are forwarded to the Snubber Test Data Reviewer for review. Turnover of the NOAs from the Snubber Functional Testing Contractor to the Snubber Test Data Reviewer occurs at least once per shift. An interim verbal notification of the NOA must also occur in a timely manner, preferably within two hours.

(5) The Snubber Data Reviewer reviews the NOA and Snubber Test Data in accordance with NEIM-00-1160, Snubber Functional Testing Data Review Program. The Snubber Data Reviewer with the Snubber Functional Testing Contractor resolves discrepancies with the Snubber Test Data and/or NOA.

(6) The Snubber Data Reviewer verifies and signs approval of the information on the attached surveillance Data Form (ST-100-002-2 or ST-200-002-2).

(7) The Snubber Data Reviewer uses the information from the NOA and the Snubber Test Data to generate a Condition Report and a Snubber Tracking Form, NEPM-QA-0595-2 and makes an entry into the Snubber Tracking Log, NEPM-QA-0595-3. This form and log must include, at a minimum, information to identify the nonconforming snubber, its hanger location, and the PPL Specification failed (M-1090 or C-1066).

(8) A unique I.D. number is assigned to the failure. This number is entered on the Snubber Tracking Form and Log. This number is representative of the specific Unit's refueling outage and the Snubber Functional Testing Contractor's NOA number. (i.e., Number of the unit, dash, refuel outage number, dash, and the next sequential number (example 1-03-05)).

(9) The Snubber Data Reviewer ensures a PPL Representative verifies the Snubber NOA Tag is correctly hung and the tag information is accurate. This verification is documented on the applicable line of the Snubber Tracking Form.

(10) An Operability and Reportability Determination is performed for the failure in accordance with NDAP-QA-0702, Action Request and Condition Report Process. For snubbers previously installed in the plant, the snubber's operability is predetermined to be inoperable and a ZWO flags the need to have an Engineering Evaluation completed prior to the system's return to operable status.

This ZWO number is entered on the Snubber Tracking Form. The ZWO is closed only following a "no effect" disposition of an Engineering Evaluation for pipe/component stress evaluation or when a Work Order for additional exams or rework is generated.

(11) Failures of snubbers previously installed in the field require an AR-CR Report. Additionally, a Condition Report Action (CRA) form in NIMS, to Civil/Structural Design Group to evaluate the effect of the failed snubber on the system pipe (excluded are spares and snubbers functionally tested due to potential damage from handling following an initial passing functional test). The CRA number is logged and tracked in the Snubber Tracking Log (Attachment E).

Documentation of the CRA disposition generated from the functional snubber failure will be attached to the Condition Report by Civil/Structural Design Group. Depending on the amount of stress to the system pipe from the snubber failure, an Engineering Evaluation disposition may require inspecting piping or attached components. If such an inspection is required, the quality of the piping/ components is indeterminate, a Condition Report (CR), may be generated to track the nonconforming condition. The inspection may be performed under a Work Order.

(12) The Snubber Data Reviewer maintains the Snubber Tracking Log current with the Snubber Tracking Form. The Snubber Tracking Log, or computerized sorts of the same is used to status the condition of the snubber and snubber location.

(13) The Supervisor-NDE-SSES decides what reports are needed during outages to provide formal reporting and notification to the parties involved/interested in snubber functional testing. These reports may be used for ISI status meetings, routine snubber test status reports, outage work summaries, and noncompliance summaries, to include the notification of untimely responses.

(14) Functional Test Failure snubbers may be reworked, scrapped, or set aside for training. The failed snubbers outcome is documented on the Condition Report and on the Snubber Tracking Form. Information documenting what action was taken is attached to the Condition Report. For Snubbers being scrapped or labeled for "TRAINING," fill out Attachment F, Snubber Disposition Documentation Form. The NOA Tag is removed by the Snubber Program Coordinator or his designee, the disposition of the snubber is documented on the SNUBBER Tracking Form. (If a CR Hold Tag has been attached, notify Q.C. for removal of their Tag.) Depending on the completion of the Engineering Evaluation and hanger location rework, the Snubber Tracking Form may or may not close at this time. (3)

(15) The failed snubbers may not leave the area set aside for failed snubber segregation until the associated CR is dispositioned and the nonconformance tag is removed from the snubber by Quality Control personnel.

(16) Closure of a Snubber Tracking Form requires addressing blocks A, B, and C of the Snubber Tracking Form.

(17) A Copy of the closed Snubber Tracking Form, NEPM-QA-0595-2 and completed Snubber Tracking Logs, NEPM-QA-0595-3 are retained in accordance with Section 11.0 of this procedure by the ISI Group. Attached to the forms are copies of associated documentation, to include NOAs, Snubber Testing Data Sheets, Engineering Evaluation Dispositions, etc.

(18) Trending and tracking of the Snubber Testing Program is accomplished by the Snubber Operating History Reviews per Refuel Cycle (ST-100-003 and ST-200-003).

1.1.1

(3) NQA Audit Recommendation 92-111

9.4 Snubber Operating History Review per Refuel Cycle

9.4.1 A history review program establishes and maintains the history of the maintenance/inspection activities for safety related snubbers. This review is documented via ST-100-003 and ST-200-003 "Snubber Operating History Review."

9.4.2 The history review surveillance for snubbers is considered by the ISI Group non-routine and is not "automatically" scheduled by NIMS. The ISI Group schedules the review and initiates a Surveillance Authorization (RTSV), per NDAP-QA-0722 to initiate the snubber history review. (1)

9.5 Snubber Change/Modification Documentation

9.5.1 Snubbers/snubber parts, which are added, deleted, repaired, modified, or replaced require completion of a Snubber Change Notice (Form NEPM-QA-0595-1) to be initiated by the group effecting the change. The original of the Snubber Change Notice is included in the Work Order Package and a copy is sent to the ISI Group.

9.5.2 Snubber/snubber parts repaired, modified, or replaced that are included within an ASME III, Class 1, 2, or 3 System Boundary, require completion of an ASME Code Repair Form (Form MT-AD-522-1) and NIS-2 Form. ISI Group completes the forms. MT-AD-522 forms are added to the Work Order packages and the NIS-2 forms sent to the state (within 90 days) of the end of outage by the Outage Summary Report.

9.5.3 If ASME SPARE PARTS are utilized:

a. ISI shall document this information in the comments section of the Snubber Change Notice, NEPM-QA-0595-1. This information found on the warehouse green card shall include: item, description, quality class, P.O. number, heat number, serial number, and size of snubber as applicable.

b. QC will perform Material Verification as identified in NDAP-QA-0201.

1.1.1

(1) Audit Finding 88-066-02

c. All snubber parts are ASME except pivotal bushing, washers/spacers, snap rings, locking nuts for load studs, and dust cover screws.

9.5.4 Changes to SSES drawings and NIMS data base required by the changes/modifications of snubbers will be reported for NIMS Component Database by submitting a data problem report and configuration differences will be resolved for as-built SSES drawings by notifying Station Engineering and documenting the Condition on a CRA.

9.6 System Operability/Reportability

9.6.1 If a snubber nonconformance is identified, an AR-CR report shall be initiated. With generation of the CR, a preliminary Operability Impact and Reportability Determination is performed in accordance with NDAP-QA-0702. During the Preliminary Determination or any subsequent step of CR disposition, should it be discovered that the snubber is inoperable, Operations Shift Supervision is notified immediately of the Technical Requirement TRO condition (3.7.8) and a ZWO is to be entered. The CR for an inoperable snubber requires a CRA for an engineering evaluation by Civil/Structural Design Group. The engineering evaluation determines the effect the inoperable snubber had on the components the snubber was attached to. A walkdown is performed on the system piping in the area of the inoperable snubber and additional nonconformances found are added to the CR. The inoperable snubber is stored until it can be functionally tested unless Civil/Structural Design Group requires immediate test results to perform their evaluation. If the snubber fails its functional test, a failure analysis is performed to determine the cause of the failure.

9.6.2 During Outages, a planned Snubber Functional Test Program removes/reinstalls snubbers in bulk quantities for testing. These packages consist of a quantity of snubbers easily handled by the work group and contain snubbers located on the same system.

For each snubber failure a Condition Report is generated and Operability determinations are "yes." An independent "engineering evaluation" ZWO is generated in NIMS. This "engineering evaluation" ZWO ensures piping/weld stresses due to the failed snubber are analyzed prior to returning the system to operable. The ZWO must identify the system(s) effected considering the inoperable snubber's impact to the piping structural integrity. Pipe calculation boundaries must be used in making this determination. The Snubber Inspection Comment/Closeout sheet, Form MT-099-006-7 for that hanger location, and its WO may be closed after the "engineering evaluation" ZWO is entered (Providing reinstallation work is complete).

The "engineering evaluation" ZWO may be pulled by Operations following a "no effect on the system" disposition by Civil/Structural Design Group.

9.7 Snubber Refurbishment

9.7.1 Failed snubbers must have a failure analysis performed and documented (per M-1090, appendix B) to determine the failure mode.

a. Document the following on Acceleration Failures:

(1) External Mandrel Measurement

(2) Internal Capstan Spring Measurement

b. Determine the amount of grease on the Mandrel and Capstan Spring and document.

9.7.2 Failed and degraded snubbers have an initial evaluation performed by the Snubber Program Coordinator to determine if refurbishment is cost effective.

9.7.3 If the Snubber Program Coordinator's initial evaluation determines snubber repair is potentially cost effective, the snubber is disassembled to allow a final evaluation of economic feasibility based on actual failure mode (failed snubbers may already be disassembled for M-1090 failure analysis).

9.7.4 The disassembly, rebuild cost estimation, and repair are performed by a PPL approved vendor. Though the vendor supplies copies of its QA/QC program and repair procedures to PPL for review, the vendor has the final responsibility for QA/QC involvement required by their repair procedures.

9.7.5 For snubbers refurbished onsite:

a. Any Q part used in onsite snubber refurbishment must be accompanied with a green material approval tag (attached by QA Receiving). This green tag is removed during refurbishment and included with the snubber's repair documentation.

b. Replacement of any part during refurbishment requires the generation of a Snubber Change Notice form NEPM-QA-0595-1 (Attachment A) by the vendor.

c. Replacement of ASME parts requires when applicable the generation of MT-AD-522-1 Forms and NIS-2 Forms by the ISI Group.

9.7.6 For snubbers refurbished offsite, the documentation of Q material traceability is the CMTR (for ASME) and C-of-C sent to QC Receiving by the vendor. The material traceability is part of the Snubber Rebuild Report supplied to PPL.

9.7.7 If vendor repair involves welding, prior ANII notification and ANII access to the vendor's facility is required.

9.7.8 Refurbished snubbers are functionally tested by a PPL approved vendor (may be vendor responsible for refurbishment). The functional test results are provided to PPL by the vendor performing the testing.

9.7.9 When it's not cost effective to refurbish a snubber, the snubber may be scrapped, used for parts, used for training, etc., as directed by the Snubber Program Coordinator. (Following disassembly for failure analysis, decontamination, etc., as needed). Snubbers used for training are distinctly marked to prevent their misplacement/reuse. Attachment F - Snubber Disposition Documentation Form - must be filled out.

10. FINAL ACCEPTANCE CRITERIA/POST MAINTENANCE TESTS

10.1 All Final Acceptance Criteria is found in M-1090, Technical Specification for Inservice Testing of Safety Related Mechanical Snubbers and Compensating Struts or C-1066, Technical Specification for Inservice Testing of Non-safety Related Mechanical Snubbers and ST-100-002 or ST-200-002.

11. RECORDS

11.1 The following attachments (if required) are retained by DCS within their respective work packages:

11.1.1 NEPM-QA-0595-1, Snubber Change Notice

11.1.2 MT-AD-522-1, ASME Code Program Form

11.1.3 Vendor repair and/or replacement records (when applicable).

11.2 The following will be forwarded to CM-DCS post outage:

11.2.1 Closed Snubber Tracking Forms (NEPM-QA-0595-2)

11.2.2 Completed Snubber Tracking Logs (NEPM-QA-0595-3)

SNUBBER CHANGE NOTICE

PCWO No. _____
Hanger No. _____

TYPE OF CHANGE: Circle

Snubber was added	Snubber was deleted
Snubber was replaced	Snubber was repaired
Parts Replaced	Other

EXPLANATION/COMMENTS: _____

_____

_____

_____

Check one:

DAMAGED BY SERVICE _____

DAMAGE DURING REMOVAL/REINSTALLATION _____

LOST _____

NOTE: All Damaged Parts must be identified and brought to the Test Area.

ADDITIONAL INFORMATION:

OLD/EXISTING SNUBBER	NEW/REPLACEMENT SNUBBER
Serial No. _____	Serial No. _____
Size _____	Size _____
Year Built _____	Year Built _____
ASME Stamped _____ (Y / N)	ASME Stamped _____ (Y / N)

_____ _____ _____
NAME SIGNATURE DATE

TYPICAL NOTICE OF ANOMALY FORM AND TAG (NOA)

NOTICE OF ANOMALY | DATE:

NOTICE NO: _____ P.O. NUMBER: _____ CONTRACT NO: _____

CUSTOMER: _____ JOB NO: _____

NOTIFICATION MADE TO: _____ NOTIFICATION DATE: _____

NOTIFICATION MADE BY: _____ VIA: _____

CATEGORY: ☐ SPECIMEN ☐ PROCEDURE ☐ TEST EQUIPMENT DATE OF ANOMALY: _____

PART NAME: _____ PART NO. _____

TEST: _____ LS. NO. _____

SPECIFICATION: _____ PARA. NO. _____

REQUIREMENTS:

DESCRIPTION OF ANOMALY:

DISPOSITION - COMMENTS - RECOMMENDATIONS

NOTE: IT IS THE CUSTOMER'S RESPONSIBILITY TO ANALYZE ANOMALIES AND COMPLY WITH 10 CFR PART 21.

VERIFICATION:

TEST WITNESS: _____ PROJECT ENGINEER: _____

REPRESENTING: _____ PROJECT MANAGER: _____

QUALITY ASSURANCE: _____ INTERDEPARTMENTAL COORDINATION: _____

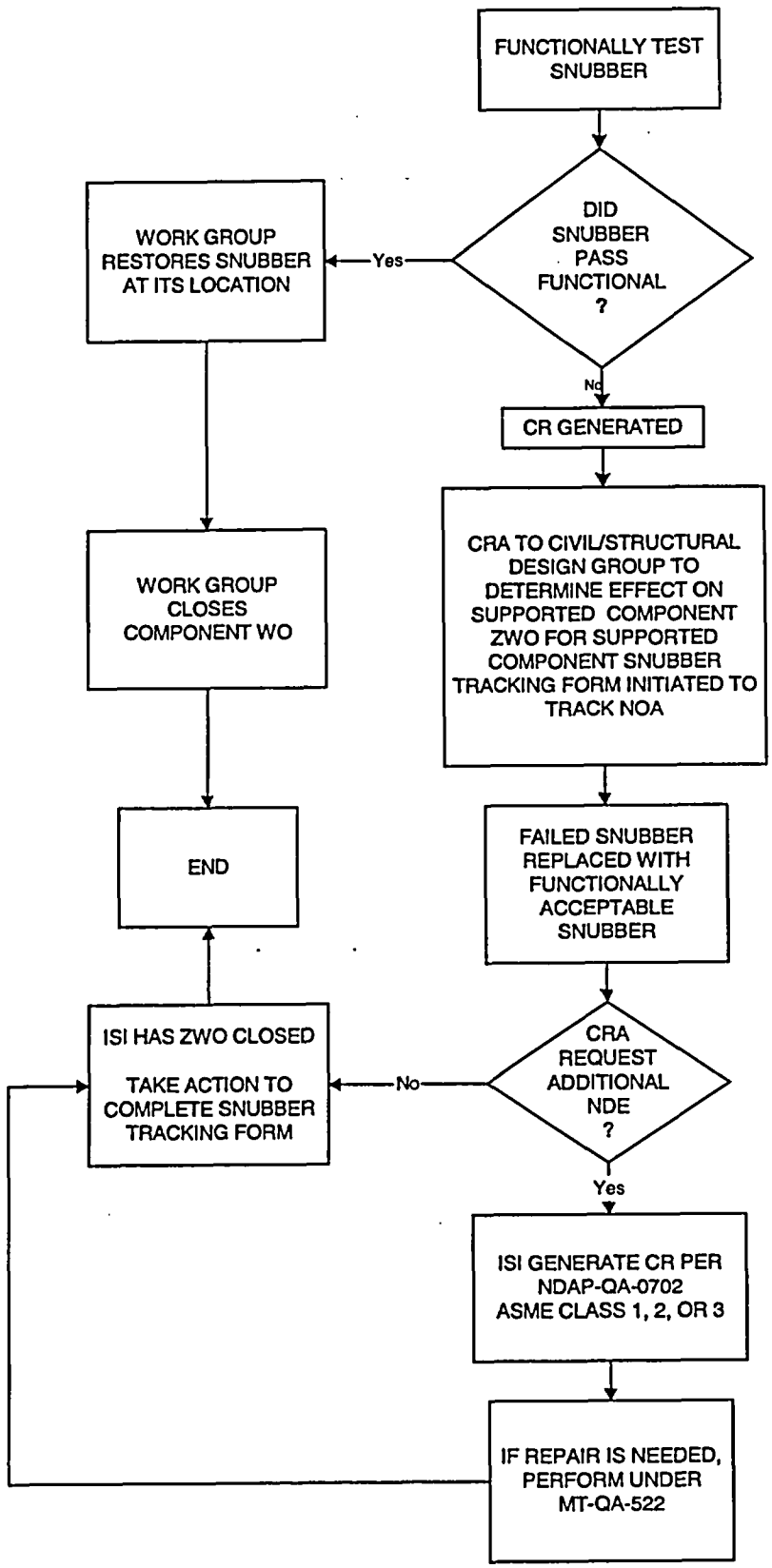
NOA_____ **Quality Assurance REJECT**

WO #_____ Serial #_____ Size_____ ○

Exam#_____ Date Rejected_____

Hanger ID _____ Inspected By_____

SNUBBER REMOVAL AND TESTING FLOWPATH



SNUBBER TRACKING FORM
SNUBBER TRACKING NUMBER _____
TEST NUMBER _____

SERIAL NUMBER _____	HANGER ID _____	FAILURE MODE(s)	
SIZE	HANGER LOC A- _____ ELEV _____	( ) BF	( ) L/U
TYPE _____	SYSTEM _____	( ) RDF	( ) FOM
	TESTING SPEC. _____	( ) AC	( ) ANOM

NOA TAGGING VERIFIED _____ NAME _____ DATE

_____ NAME _____ DATE _____ ZWO

_____ NAME _____ DATE _____ CR #

A. ENGINEERING EVALUATION DISPOSITION

_____ CRA #

_____ No effect on System*

_____ Additional NDE examination required. WO # _____ generated*

_____ No evaluation required (spare failure, passing anomaly)

*Approved dispositioned CRA attached.

B. HANGER ACTION REQUIRED

_____ Reworked/reinstalled original Snubber WO _____

_____ Replaced snubber under WO _____ with S/N _____

_____ None required (reduction/spare)

Other _____

Disposition of Snubber:

_____ Rework

_____ Scrap

_____ Other _____

_____ _____
Snubber Test Coordinator Date

C. Snubber Action Required

_____ Controlled by CR _____

_____ Reworked and passed testing*

_____ Scrapped*

_____ Other _____

* Documentation attached

Approval to close A, B, and C complete _____ Name _____ Date

NOA Tag removed by _____ Name _____ Date

SNUBBER TRACKING FORM
SNUBBER TRACKING NUMBER _____
TEST NUMBER _____

COMPLETE SNUBBER TRACKING FORM

Snubber Tracking number assigned by: x-yy-zz where
x is the unit, yy is the refuel outage number, zz is NOA #

Test Number:	Snubber Functional Testing Contractors test #
Snubber ID:	serial number from snubber size in PSA/PSB and KIP rating type as 306 or 307
Hanger ID:	ID description location as area/elevation system as SSES system/outage window (Div #, bulk, LPCI, etc.)
Testing Spec:	PPL Spec applicable (M1090/C1066)
Failure Mode:	check all spec failures applicable BF breakaway LU lockup RDF running drag FOM freedom of motion AC acceleration ANOM anomalous data
NOA Tagging Verified:	Signature of PPL representative verification Also, use this block for reverification info
CR#	CR# generated for covering failure
CRA to Civil/Structural Design Group Evaluation Disposition:	Check applicable action, Include documentation from CRA dispositioned
ZWO	ZWO# to hold system open
Hanger Action Required:	Check applicable action, "other" requires explanation/documentation
Snubber Action Required:	Check applicable action, "other" requires explanation, Include documentation if * is applicable
Approval to Close:	Snubber Test Coordinator signature Must have completed: Civil/Structural Design Group Evaluation Disposition Hanger Action Required Snubber Action Required
NOA Tag removed by:	Signature of PPL representative removing tag

Attachment E
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SNUBBER TRACKING LOG

Page ____ of ____

STN #	Hanger ID	Size	Serial #	Replc Number	Syst #	DC	Original WO	CR	CRA	ZWO	Close Date	Comments

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COMPLETING SNUBBER TRACKING LOG

STN #	Insert Snubber Tracking Number as x-yy-zz where: x is unit number yy is sequential outage number zz is sequential NOA for that outage Enter Contractor test #
Hanger ID:	Hanger identification number
Size:	Snubber size as PSA/PSB and KIP rating
Serial Number:	Snubber serial number
Replc Number:	Serial number of replacement snubber (if applicable)
Syst #:	SSES system number
DC:	M for M-1090 spec or C for C-1066 spec or DC number
WO	WO # used for snubber testing
CR #:	CR # issued for snubber functional failure
CRA #:	CRA # for Civil/Structural Design Group evaluation
ZWO #:	ZWO # to hold system inoperable
Close date:	Closing date of Snubber Tracking Form
Comments:	Add comments for additional info/clarification

Attachment F
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SNUBBER DISPOSITION DOCUMENTATION FORM

The snubbers listed below have completed the disposition action required by their respective Snubber Tracking Form or CR. (If action required is not an STF/CR requirement, provide information as to cause of action.)

SERIAL #	SIZE	PREVIOUS LOCATION	STF/CR/ OTHER	COMMENTS	DISPO INITIAL	WITNESSED BY & DATE

Additional comments:

SNUBBER VISUAL INSPECTION INTERVAL NUMBER OF UNACCEPTABLE SNUBBERS			
Population or Category (Notes 1 & 2)	Column A Extend Interval (Notes 3 & 6)	Column B Repeat Interval (Notes 4 & 6)	Column C Reduce Interval (Notes 5 & 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
1,000 or greater	29	56	109

NOTE (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 license 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.

NOTE (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 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 Surveillance Requirement shall be performed within the specified surveillance interval with a maximum allowable extension not to exceed 25 percent of the specified surveillance interval.

PP&L

M E M O R A N D U M

TO: John E. Lines DATE: September 10, 1991

FROM: Mark S. Saxon

JOB: SSES Unit 1 NO: CE - 2451 COPIES: T. K. Steingass
T. A. Corman
J. A. Swankoski
C. L. Dvorscak

FILE: Civil Memos

SUBJECT: Main Steam Snubber Functional Testing

EWR M90328 required that all Main Steam snubbers on calculation 600-1 be functionally tested every outage due to reoccurring vibration problems. We have reviewed this requirement based on subsequent outage testing and we believe the 100% functional testing of main steam snubbers can be limited to the snubbers from the stop valves to the turbine. This includes snubbers DBB-101-H13, DBB-102-H17, DBB-104-H18, and all MSL snubbers. The snubber functional testing program can be revised accordingly.

Mark S. Saxon

9/10/91

Take Care

PP&L

M E M O R A N D U M

TO: John E. Lines DATE: November 20, 1991

FROM: Mark S. Saxon

JOB: SSES Unit 1 & 2 NO: CE - 2490 COPIES: T. K. Steingass
T. A. Gorman
J. A. Swankoski
C. L. Dvorscak
A. Zito

FILE: Civil Memos

SUBJECT: Main Steam Snubber Functional Testing - Unit 2

Reference: CE-2451

EWR M90328 required that all Main Steam snubbers on calculation 600-1 be functionally tested every outage due to reoccurring vibration problems. We reviewed this requirement based on subsequent outage testing and decided that the 100% functional testing of main steam snubbers could be limited to the snubbers from the stop valves to the turbine (see the referenced memo). While this EWR addressed Unit 1 only, similar concerns also exist on Unit 2. Based on this, please insure that all Unit 2 MSL snubbers plus DBB-203-H21, DBB-204-H17 and DBB-201-H24 are included in the scope of functional testing.

Mark S. Saxon

Take Care

Attachment 4 to PLA-5753

Unit 1 TRM Section 3.7.8
and
TRM Bases Section B 3.7.8

3.7 Plant Systems

3.7.8 Snubbers

TRO 3.7.8 All snubbers shall be OPERABLE

APPLICABILITY: At all times

---------- NOTE ----------
Applicable only for CONDITIONS C and D

MODES 1, 2, and 3
MODES 4 and 5 for snubbers located on systems required to be OPERABLE in those MODES.

ACTIONS

---------- NOTE ----------
Separate condition entry is allowed for each snubber

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. ----------NOTE---------- Required Action A.2 shall be completed if this Condition is entered. ---------- One or more snubbers inoperable	A.1 Replace or restore the inoperable snubber(s) to OPERABLE status AND A.2 Perform an engineering evaluation on the supported component	72 hours 72 hours
B. Required Action and associated Completion Time of Condition A not met	B.1 Declare the supported system inoperable	Immediately

(continued)

Actions (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Any snubber selected for functional testing either fails to activate or fails to move due to manufacturer or design deficiency	C.1 ----------NOTE---------- This action shall be independent of the Testing Requirements for snubbers not meeting the functional test acceptance criteria per TRS 3.7.8.2 ---------- All snubbers of the same design subject to the same defect shall be functionally tested	Within the current Inspection interval
D. The snubber service life will be exceeded prior to the next scheduled snubber service life review	D.1 Reevaluate the snubber service life OR D.2 Replace or recondition the snubber so as to extend its service life beyond the date of the next scheduled service life review	Prior to exceeding snubber service life Prior to exceeding snubber service life

TECHNICAL REQUIREMENT SURVEILLANCE

SURVEILLANCE		FREQUENCY
TRS 3.7.8.1	Demonstrate each snubber OPERABLE by performance of visual inspection	As directed by Table 3.7.8-1
TRS 3.7.8.2	Perform functional test of a representative sampling of all snubbers per Table 3.7.8-3.	24 months

(continued)

TECHNICAL REQUIREMENT SURVEILLANCE

	SURVEILLANCE	FREQUENCY
TRS 3.7.8.3	----------NOTE---------- Documentation of critical parts replaced so that the maximum service life is not exceeded shall be retained as required by FSAR 17.2-17 ---------- Monitor the installation and maintenance records for each snubber to ensure that the service life has not been exceeded and will not be exceeded prior to the next snubber surveillance inspection.	24 months
TRS 3.7.8.4	----------NOTE---------- Snubber tested per this surveillance are in addition to snubbers selected for the sample plan per TRS 3.7.8.2 ---------- Test snubbers in locations of snubbers that failed the functional test during the previous test period and test repaired failed snubbers placed in new locations.	At the time of the next functional test
TRS 3.7.8.5	An inspection shall be performed of all snubbers attached to sections of systems that have experienced unexpected, potentially damaging transients as determined from a review of operational data and a visual inspection of the systems.	Within 6 months of transient

Table 3.7.8-1
SNUBBER VISUAL INSPECTION INTERVAL

Number Of Unacceptable Visually Inspected Snubbers in Previous Inspection Interval	Inspection Interval
1. Equal to or less than the applicable number in Table 3.7.8-2 Column A	May be twice the previous interval but not greater than 48 months
2. Equal to or less than the applicable number in Table 3.7.8-2 Column B but greater than the applicable number in Column A	Same as the previous interval
3. Equal to or greater than the applicable number in Table 3.7.8-2 Column C	Two-thirds of the previous interval
4. Less than the applicable number in Table 3.7.8-2 Column C but greater than the applicable number in Column B	Equal to the previous interval (I_{i-1}), reduced proportionally by a factor that is one-third of the ratio of the difference between the number of unacceptable snubbers found during the previous interval (N_{i-1}) and the number in Column B (N_B) to the difference in the numbers in Columns C (N_C) and B, or: $$I_i = I_{i-1} - \frac{1}{3} I_{i-1} \left(\frac{N_{i-1} - N_B}{N_C - N_B} \right)$$

TABLE 3.7.8-2
NUMBER OF UNACCEPTABLE SNUBBERS
PREVIOUS SNUBBER VISUAL INSPECTION INTERVAL

Population	Column A	Column B	Column C
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
1,000 or greater	29	56	109

NOTES

1. 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 integer includes a fractional value of unacceptable snubbers as determined by interpolation.

2. The provisions of TRS 3.0.2 are applicable for all inspection intervals up to and including 48 months

TABLE 3.7.8-3

FUNCTIONAL TESTING

SAMPLE	FAILED SNUBBERS	REPRESENTATIVE SAMPLING (a)
1. Initial	0	10%
2. Re-Test	>0 in initial sample	Additional 5%[(b)] for each failure
3. Continued Testing	>0 In Re-tester or Continued Testing Samples	Additional 5% for each failure to 100%[(b)]

(a) Percentage of the total population of each type of snubber

(b) An engineering evaluation shall be made of each failure to meet the functional test acceptance criteria to determine the cause of the failure and the determine the OPERABILITY of other snubbers, irrespective of type, which may be subject to the same failure mode. The results of this evalution shall be used. If applicable, in selecting snubbers to be tested. If additional sampling is required due to failure of only one type of snubber, additional samples should be limited to the type of snubber which has failed the functional testing.

B 3.7.8 Snubbers

BASES

TRO

All snubbers are required to be 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 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.

Snubbers are required to be OPERABLE whenever they are considered necessary to support equipment for the systems on which they are installed.

"Type" of snubber shall mean snubbers of the same design and manufacturer, irrespective of capacity. For example, mechanical snubbers utilizing the same design features of the 2-kip, and 100-kip capacity manufactured by Company "A" are of the same type. The same design mechanical snubbers manufactured by company "B" for the purposes of this Technical Requirement would be of a different type, as would hydraulic snubbers from either manufacturer.

A list of individual snubbers with detailed information of snubber location and size and of system affected shall be available at the plant in accordance with Section 50.71(c) of 10 CFR part 50. The controlled list of plant snubbers is maintained by the ISI Program. The addition or deletion of any
snubber shall be made in accordance with Section 50.59 of 10 CFR Part 50.

(continued)

B 3.7.8 Snubbers

BASES (continued)

ACTIONS

The Actions are defined to ensure proper corrective measures are taken in response to the inoperable components.

Condition A

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

The removal or inoperability of one snubber or one set of parallel pair snubbers on an OPERABLE system does not require the supported system to be immediately declared inoperable. The removal or inoperability of more than one snubber or more than one set of parallel pair snubbers on an OPERABLE system does require the supported system to be immediately declared inoperable. Specific exceptions may be granted based on engineering evaluations.

Replacement snubbers and snubbers which have repairs which might affect the functional test shall be tested to meet the functional test criteria before installation in the unit. Mechanical snubbers shall have met the acceptance criteria subsequent to their most recent service, and the freedom of motion test must have been performed within 12 months before being installed in the unit.

Condition D

Potentially damaging transients are determined from a review of operational data and a visual inspection of the systems.

(continued)

B 3.7.8 Snubbers

BASES (continued)

TRS

The TRSs are defined to be performed at the specified Frequency to ensure that the snubbers are maintained OPERABLE. 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 snubbers for the applicable design conditions at either the completion of their fabrication or at a subsequent date. Snubbers so exempted shall be listed in the list of individual snubbers indicating the extent of the exemptions.

TRS 3.7.8.1

The visual inspection frequency is based upon maintaining a constant level of snubber protection to systems. Therefore, the required inspection varies inversely with the observed snubber failures and is determined by the number of inoperable snubbers found during an inspection. Generic Letter 90-09 provides a method for determining the next interval for the visual inspection of snubbers based upon the number of unacceptable snubbers found during the previous inspection, the total population or category size for each snubber type, and the previous inspection interval.

The visual inspection interval for a snubber population shall be determined based upon the previous inspection interval and the number of unacceptable snubbers found during that interval. 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 3.7.8-1. The visual inspection interval for each type of snubber shall be determined based upon the criteria provided in Table 3.7.8-1.

(continued)

B 3.7.8 Snubbers

BASES (continued)

TRS (continued)

Snubbers may be categorized, based upon their accessibility during power operation, as accessible or inaccessible, and are inspected on that basis. The snubber population, for the purpose of visual inspection, is determined either separately or jointly for accessible and inaccessible units. The results of snubber examinations are judged, per Table 3.7.8-2, in accordance with that population. The decision whether to combine the category populations or keep them separate must be documented before any inspection, and that decision shall be used as the basis upon which to determine the subsequent inspection interval for that category.

The accessibility of each snubber shall be determined and approved by the Plant Operations Review Committee. The determination shall be based upon the existing radiation levels and the expected time to perform a visual inspection upon the existing radiation levels and the expected time to perform a visual inspection in each snubber location as well as other factors associated with accessibility during plant operations (e.,., temperature, atmosphere, location, etc.), and the recommendations of Regulatory Guides 8.8 and 8.10.

Visual inspections shall verify that (1) the snubber has no visible indications of damage or impaired OPERABILITY, (2) attachments to the foundation or supporting structure are functional, and (3) fasteners for the attachment of the snubber to the component, and to the snubber anchorage are functional.

(continued)

B 3.7.8 Snubbers

BASES (continued)

TRS (continued)

Snubbers which appear inoperable as a result of visual inspections shall be classified as unacceptable and may be reclassified acceptable for the purpose of establishing the next visual inspection interval, provided that (1) 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 (2) the affected snubber is functionally tested in the as-found condition and
determined OPERABLE per TRS 3.7.8.2. 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 shall be met.

TRS 3.7.8.2

A representative sample of snubbers shall be tested for each type of snubber. The representative sample selected for the functional test sample plans shall be randomly selected from the
snubbers of each type and reviewed before beginning the testing. The review shall ensure as far as practical that they are representative of the various configurations, operating environments, range of size, and capacity of snubbers of each type.

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;

2) Snubber bleed, or release rate where required, is present in both tension and compression, within the specified range;

(continued)

B 3.7.8 Snubbers

BASES (continued)

TRS (continued)

3) Where required, the force required to initiate or maintain motion of the snubber is within the specified range in both directions of travel; and

4) For snubbers specifically required not to displace under continuous load, the ability of the snubber to withstand load without displacement.

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.

TRS 3.7.8.3

The maximum expected service life for various seals, springs, and other critical parts shall be determined and established based on engineering information and shall be extended or shortened based on monitored test results and failure history. Critical parts shall be replaced so that the maximum service life will not be exceeded during a period when the snubber is required to be OPERABLE. The parts replacements shall be documented and the documentation shall be retained in accordance with FSAR 17.2.17.

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.

(continued)

B 3.7.8 Snubbers

BASES (continued)

TRS (continued)

TRS 3.7.8.5

The required inspection consists of the following elements:

1. Perform a visual inspection of all affected snubbers.

2. Verify freedom of motion of mechanical snubbers by manually induced snubber movement, or

3. Verify freedom of motion of mechanical snubbers by evaluation of in-place snubber piston setting, or

Verify freedom of motion of mechanical snubbers by stroking the mechanical snubber through its full range of travel.

REFERENCES

1. Generic Letter 90-09