

NRC Form 366
(9-83)

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO. 3150-0104

EXPIRES 8/31/85

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
SURRY POWER STATION - UNIT 1	0 5 0 0 0 2 8 0	1 OF 10

TITLE (4)
Snubbers

EVENT DATE (5)			LER NUMBER (6)		REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAMES
03	01	84	84	006	00				
									DOCKET NUMBER(S)
									0 5 0 0 0

OPERATING MODE (9)		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)							
N		20.402(b)		20.406(c)		50.73(a)(2)(iv)		73.71(b)	
POWER LEVEL (10)		20.406(a)(1)(i)		50.38(c)(1)		50.73(a)(2)(v)		73.71(e)	
0 0 0		20.406(a)(1)(ii)		50.38(c)(2)		50.73(a)(2)(vii)		✓ OTHER (Specify in Abstract below and in Text, NRC Form 366A)	
		20.406(a)(1)(iii)		50.73(a)(2)(i)		50.73(a)(2)(viii)(A)			
		20.406(a)(1)(iv)		50.73(a)(2)(ii)		50.73(a)(2)(viii)(B)			
		20.406(a)(1)(v)		50.73(a)(2)(iii)		50.73(a)(2)(x)		"SPECIAL"	

LICENSEE CONTACT FOR THIS LER (12)		TELEPHONE NUMBER	
NAME		AREA CODE	
J. L. Wilson - Station Manager		8 0 4 3 5 7 - 3 1 8 4	

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)											
CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	
X	S	B	S	N	B	L	3	1	9	Y	
X	B	P	S	N	B	L	3	1	9	Y	
X	B	A	S	N	B	L	3	1	9	Y	

SUPPLEMENTAL REPORT EXPECTED (14)		EXPECTED SUBMISSION DATE (15)		MONTH	DAY	YEAR
<input type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE) <input checked="" type="checkbox"/> NO						

ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single-space typewritten lines) (16)

As a result of the performance of PT's 39.3 and 39.4 (Mechanical and Hydraulic Snubber Functional Tests respectively) performed in March 1983 and March 1984, 69 of 226 snubbers failed to meet the acceptance criteria stipulated in the snubber administrative procedure.

The testing performed in 1984 resulted from a NRC review of the testing performed in 1983. The review concluded that an insufficient number of snubbers were tested in 1983 contrary to Technical Specification 4.17.C.

The snubber program is being revised to provide better controls on maintenance and tracking of snubbers. All associated procedures will be reviewed and modified as necessary to ensure snubbers remain capable of performing their intended function and provide positive control for the seal life program.

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PDR ADOCK 05000280
S PDR

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LICENSEE EVENT REPORT (LER) FAILURE CONTINUATION

FACILITY NAME (1) VEPSPS1	DOCKET NUMBER (2) 05000280	LER NUMBER (6)			PAGE (3)	
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
		84	006	00	02	OF 10

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRPDS		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRPDS	
X	B A	S N B	I 2 0 7	Y		X	B P	S N B	I 2 0 7	Y	
E	B A	S N B	I 2 0 7	Y		X	B P	S N B	I 2 0 7	Y	
X	A B	S N B	I 2 0 7	Y		X	B P	S N B	I 2 0 7	Y	
X	S J	S N B	I 2 0 7	Y		B	B P	S N B	I 2 0 7	Y	
X	A B	S N B	I 2 0 7	Y		X	B P	S N B	I 2 0 7	Y	
E	A B	S N B	I 2 0 7	Y		X	S B	S N B	I 2 0 7	Y	
X	B A	S N B	I 2 0 7	Y		X	S B	S N B	I 2 0 7	Y	
E	B P	S N B	I 2 0 7	Y		X	S J	S N B	I 2 0 7	Y	
X	B P	S N B	I 2 0 7	Y		X	A B	S N B	P 0 2 9	Y	
E	B P	S N B	I 2 0 7	Y		X	A B	S N B	P 0 2 9	Y	
E	A B	S N B	I 2 0 7	Y		X	A B	S N B	P 0 2 9	Y	
E	A B	S N B	I 2 0 7	Y		X	A B	S N B	P 0 2 9	Y	
X	A B	S N B	I 2 0 7	Y		X	A B	S N B	P 0 2 9	Y	
E	A B	S N B	I 2 0 7	Y		X	B I	S N B	P 0 2 9	Y	
X	A B	S N B	I 2 0 7	Y		B	W I	S N B	P 0 2 9	Y	
E	A B	S N B	I 2 0 7	Y		B	W I	S N B	P 0 2 9	Y	
E	B P	S N B	I 2 0 7	Y		X	A B	S N B	P 0 2 9	Y	
X	B P	S N B	I 2 0 7	Y		X	A B	S N B	P 0 2 9	Y	
X	B P	S N B	I 2 0 7	Y		X	A B	S N B	I 2 0 9	Y	
B	W I	S N B	I 2 0 7	Y		X	W I	S N B	I 2 0 9	Y	
X	B P	S N B	I 2 0 7	Y							
X	B P	S N B	I 2 0 7	Y							
E	B P	S N B	I 2 0 7	Y							
E	B P	S N B	I 2 0 7	Y							
X	B P	S N B	I 2 0 7	Y							
E	B P	S N B	I 2 0 7	Y							

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TEXT (If more space is required, use additional NRC Form 366A's) (17)

1. Description of the Event

As a result of the performance of PT's 39.3 and 39.4 (Mechanical and Hydraulic Snubber Function Tests respectively) performed in March, 1983 and March, 1984, 69 of 226 snubbers failed to meet the acceptance criteria stipulated in the snubber administrative procedure. The breakdown of hydraulic and mechanical snubbers is given below and a listing of failed snubbers is provided in Attachment 1.

1983

	TESTED	FAILED	%
HYDRAULIC	37	10	= 31.2
MECHANICAL	21	9	= 34.6

1984

	TESTED	FAILED	
HYDRAULIC	123	38	= 30.9
MECHANICAL	45	12	= 26.7
TOTALS	226	69	= 30.5%

The testing performed in 1984 was in response to a NRC review of the testing performed in 1983. The review concluded that an insufficient number of snubbers were tested in 1983 contrary to Technical Specification 4.17.C.

2. Safety Consequences and Implications

Snubbers prevent unrestrained pipe motion during seismic or severe hydraulic transients while allowing pipe thermal movement during normal operation. An inoperable snubber may increase the probability of pipe over-stress in either case depending upon the failure mode of the snubber.

As required by Technical Specification 4.17.C.9, all snubbers determined inoperable by functional testing were analyzed to determine the affect on the associated equipment or piping.

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TEXT (If more space is required, use additional NRC Form 365A's) (17)

Since a snubber with lockup rates below the acceptance criteria would still perform its intended function during a seismic or severe hydraulic transients, snubbers which performed in this manner were analyzed under normal operational thermal movement conditions as rigid constraints utilizing the NUPIPE stress code. The results of this analysis, indicated that no safety related piping or components would have been overstressed.

A snubber exhibiting high lockup rates does not affect piping or components during normal operation, but could degrade the capability of a system to withstand seismic or severe hydraulic transient events. Engineering review indicates that no such dynamic events have occurred which might result in overstress concerns. However, because of the high failure rate exhibited in this test population, a seismic analysis was conducted assuming no restraint in DBE conditions. These analyses results indicate that no piping overstress would have occurred had a dynamic event been sustained. Analysis of equipment and nozzle loads in this condition is not complete at this time.

Snubbers which failed the functional test due to high or low bleed rates were not analyzed since bleed occurs only after lockup and therefore does not pose a problem during normal operations.

Based on the above, the health and safety of the public were not affected.

3. Cause

Hydraulic: Of the 48 snubbers that failed the functional test, 21 were reset to design conditions and reinstalled. Of the remaining 27, 23 have been disassembled to date in an attempt to determine the cause of failure. The results of the disassembly are presented below:

Mark No.	Size	Mfgr. Type	Probable Cause
1983			
1-RC-HSS-139	12"	Pathon	No Observable Defect
1-RC-HSS-171	12"	Bergen-Paterson	No Observable Defect
1-RC-HSS-122	6"	Pathon	No Observable Defect
1-RC-HSS-102	1 1/2"	Lynair	Degraded EP Seals
1-WGCB-HSS-2	1 1/2"	Lynair	Degraded EP Seals
1-CH-HSS-301	1 1/2"	Lynair	Degraded EP Seals

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TEXT (If more space is required, use additional NRC Form 366A's) (17)

Mark No.	Size	Mfgr. Type	Probable Cause
1984			
1-RH-HSS-101A	1½"	Lynair	No Observable Defect
1-RH-HSS-105	1½"	Lynair	No Observable Defect
1-WCMU-HSS-10J	1½"	Lynair	No Observable Defect
1-RC-HSS-105	1½"	Lynair	Polyurethane Piston Seals
1-RC-HSS-106	1½"	Lynair	Polyurethane Piston Seals
1-RC-HSS-107	1½"	Lynair	Polyurethane Piston Seals
1-RC-HSS-108	1½"	Lynair	Polyurethane Piston Seals
1-RH-HSS-19	1½"	Lynair	Polyurethane Piston Seals
1-RH-HSS-25	1½"	Lynair	Polyurethane Piston Seals
1-RH-HSS-100	1½"	Lynair	Polyurethane Piston Seals
1-RH-HSS-3	2½"	Lynair	Poppet Upside Down
1-RH-HSS-15	1½"	Lynair	Poppet Upside Down
1-WAPD-HSS-142	1½"	Lynair	Debris in Fluid, Poppet Upside Down
1-RC-HSS-113	1½"	Lynair	Poppet Stuck
1-RH-HSS-13	1½"	Lynair	Lockup Adjustment Screw Broken
1-RH-HSS-101B	1½"	Lynair	Piston/Cylinder Scoring
1-WGCB-HSS-03	1½"	Lynair	Piston/Cylinder Scoring

The nature of the test results and small sampling size do not yield conclusive results. The most common feature among the failed snubbers is that the majority are of the ITT Grinnel Lynair Type. As a result, action is being taken to remove all Lynair type snubbers from service and replace them with Miller type snubbers where possible.

Mechanical: Of the 21 mechanical snubbers that failed the functional test, fourteen (14) failed due to high drag. Five snubbers were disassembled to determine failure mode. The results of the disassembly are presented below.

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TEXT (If more space is required, use additional NRC Form 366A's) (17)

Mark No.	Size	Failure Mode	Cause
1983			
1-SHP-MSS-55A	PSA - 3	High Drag	No Observable Defect
1-SHP-MSS-56B	PSA - 3	Locked Up	No Observable Defect
1984			
1-PS-MSS-12C	PSA - $\frac{1}{2}$	High Drag	No Observable Defect
1-WGCB-MSS-18B	PSA - $\frac{1}{2}$	Locked Up	Broken Metallic Parts in Mechanism
1-WGCB-MSS-18A	PSA - $\frac{1}{2}$	Locks up in Compression	Broken Metallic Parts in Mechanism

All but four of the remaining failures were due to high drag. Conversations and comparisons made at the manufacturer's facilities have disclosed that the manufacturer's test sequence performs acceleration testing before measuring drag, while the test method used in PT 39.3 requires a drag test before acceleration testing. It should be noted that after acceleration testing, the drag values normally return to acceptable levels and thus the method of testing used in the PT is considered conservative. The drag phenomena is being further evaluated.

4. Immediate Corrective Action

In addition to performing the analysis described in 2 above, all failed snubbers were either rebuilt, reset to design conditions or replaced prior to installation and unit startup.

5. Additional Corrective Action

Because of the improper seals discovered in some of the failed snubbers, a records search has been initiated to verify all snubbers contain proper seal material with adequate remaining service life. For those snubbers where records do not support proper seal material and seal life, the unit will be shut down within thirty-one days of startup to replace or rebuild snubbers as necessary.

In addition, most Lynair snubbers will be replaced to alleviate any generic concerns with this type snubber. Note, however, some Lynairs will not be replaced since the stroke length or loading requirements between a Lynair and newer replacement Millers is different and precludes changeout. In these cases, the Lynairs will be overhauled and tested.

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TEXT (If more space is required, use additional NRC Form 366A's) (17)

6. Action Taken to Prevent Recurrence

The entire snubber program is being reviewed and revised with emphasis on providing improved controls on maintenance and tracking of snubbers. All associated procedures will be reviewed and modified as necessary to ensure snubbers remain capable of performing their intended function and provide positive control for the seal service life program.

7. Generic Implications

Generic to Unit II.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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SURREY POWER STATION		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
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TEXT (If more space is required, use additional NRC Form 366A's) (17)

ATTACHMENT 1HYDRAULIC
1983

<u>Mark No.</u>	<u>Size</u>	<u>Type</u>	<u>Failure Mode</u>
1-CH-HSS-301	1½	Lynair	LBT, LBC*
1-WFPD-HSS-1	2½	Tompkins-Johnson	LBT
1-SHP-HSS-5A	2½	Lynair	LBT
1-RC-HSS-102	1½	Lynair	HLT
1-WGCB-HSS-02	1½	Lynair	LLT, LBT
1-SHP-HSS-1B	5"	Tompkins-Johnson	HLT, HBT
1-RC-HSS-139	12"	Pathon	HLT
1-RC-HSS-171	12"	Bergen-Paterson	LBT
1-RC-HSS-122	6"	Pathon	LBC
1-CH-HSS-302	1½"	Lynair	HLT, HBT

1984

1-SHP-HSS-21	4"	Lynair	LLT, LBT
1-S1-HSS-101	1½	Lynair	LBT
1-RS-HSS-107	3¼	Miller	LLC
1-WCMU-HSS-100	1½	Lynair	LBT
1-WAPD-HSS-141B	1½	Miller	HLT, HLL
1-WAPD-HSS-142	1½	Lynair	LBC
1-RC-HSS-111	1½	Lynair	LLT, LBC
1-WFPD-HSS-16	2½	Lynair	LBC
1-RC-HSS-112	1½	Lynair	LBT, LBC
1-RC-HSS-113	1½	Lynair	HLT, HLC
1-SHP-HSS-2A	5"	Tompkins-Johnson	LBT
1-RH-HSS-19	1½	Lynair	HBC
1-RH-HSS-12	1½	Lynair	LBT, LBC
1-RH-HSS-13	1½	Lynair	HLT, HLC
1-RC-HSS-107	1½	Lynair	HLT, HLC
1-RC-HSS-105	1½	Lynair	HLT, HLC
1-RC-HSS-102	1½	Lynair	LLT

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TEXT (If more space is required, use additional NRC Form 366A's) (17)

<u>Mark No.</u>	<u>Size</u>	<u>Type</u>	<u>Failure Mode</u>
1-RC-HSS-108	1½	Lynair	HCT, HBT
1-RC-HSS-104	1½	Lynair	LLT
1-RC-HSS-106	1½	Lynair	HLT, HLC
1-RH-HSS-100	1½	Lynair	HLT, LLC, HBT
1-RH-HSS-22	1½	Miller	LLT
1-RH-HSS-105	1½	Miller	LLT, LLC
1-WGCB-HSS-03	1½	Lynair	HLT, HLC
1-RH-HSS-11	1½	Lynair	LLT
1-RH-HSS-8	2½	Lynair	LLT
1-RH-HSS-3	2½	Lynair	HLT, HLC
1-RH-HSS-15	1½	Lynair	LLT
1-RH-HSS-24	1½	Lynair	HLT, HBT
1-RH-HSS-25	1½	Lynair	HLT, HBC
1-RH-HSS-23	1½	Miller	LLT
1-RH-HSS-117	1½	Miller	LLT
1-RH-HSS-103	2½	Miller	LLC
1-RH-HSS-101B	1½	Lynair	LBC
1-RH-HSS-101A	1½	Lynair	HLT, HBT, LBC
1-SHP-HSS-35A	6"	Miller	LLT
1-SHP-HSS-34A	6"	Miller	HLT, HLC
1-WFPD-HSS-2	2½	Miller	LBC

FAILURE CODES:

- LLT - Low Lockup Tension
- LLC - Low Lockup Compression
- LBT - Low Bleed Tension
- LBC - Low Bleed Compression
- HLT - High Lockup Tension
- HLC - High Lockup Compression
- HBT - High Bleed Tension
- HBC - High Bleed Compression

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TEXT (If more space is required, use additional NRC Form 366A's) (17)

MECHANICAL1983

<u>Mark No.</u>	<u>Size</u>	<u>Failure Mode</u>
1-SHP-MSS-54A	3	High Drag
1-SHP-MSS-54B	3	High Drag
1-WGCB-MSS-10	1/2	Locked Up
1-SHP-MSS-55A	3	High Drag
1-SHP-MSS-55B	3	High Drag
1-WGCB-MSS-14A	1/2	High Acceleration
1-SHP-MSS-56A	3	Locked up at 5" Stroke
1-WGCB-MSS-13	1/2	High Drag
1-SHP-MSS-56B	3	Locked Up

1984

1-PS-MSS-2C	1/4	High Drag
1-PS-MSS-2B	1/4	High Drag
1-PS-MSS-2A	1/4	High Drag
1-PS-MSS-23B	1/4	Locked Up
1-PS-MSS-12C	1/2	High Drag
1-SW-MSS-2	1/2	High Drag
1-WGCB-MSS-18A	1/2	Locks up in compression
1-WGCB-MSS-18B	1/2	Locked Up
1-RC-MSS-220	1/2	High Drag
1-RC-MSS-116A	3	High Drag
1-RC-MSS-115B	3	High Drag
1-WGCB-MSS-15B	1/2	High Drag

Vepco

VIRGINIA ELECTRIC AND POWER COMPANY
Surry Power Station
P. O. Box 315
Surry, Virginia 23883

APR 16 1984

Serial No: 84-014

Docket No: 50-280

License No: DPR-32

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Gentlemen:

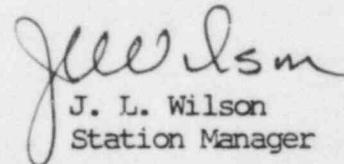
Pursuant to Surry Power Station Technical Specifications, the Virginia Electric and Power Company hereby submits the following Licensee Event Report for Surry Unit 1.

REPORT NUMBER

84-006-00

This report has been reviewed by the Station Nuclear Safety and Operating Committee and will be reviewed by Safety Evaluation and Control.

Very truly yours,


J. L. Wilson
Station Manager

Enclosure

cc: Mr. James P. O'Reilly
Regional Administrator
Suite 2900
101 Marietta Street, NW
Atlanta, Georgia 30303

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