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SUBJECT: LER 89-009-00:on 890523,three safety-related mechanical  
 snubbers in containment inoperable.W/890622 ltr.  
 W/8 ltr.

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**Southern California Edison Company**

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June 22, 1989

U. S. Nuclear Regulatory Commission  
Document Control Desk  
Washington, D.C. 20555

Subject: Docket No. 50-361  
30-Day Report  
Licensee Event Report No. 89-009  
San Onofre Nuclear Generating Station, Unit 2

Pursuant to 10 CFR 50.73(d), this submittal provides the required 30-day written Licensee Event Report (LER) for an occurrence involving snubber surveillance failures. Neither the health and safety of plant personnel or the public was affected by this occurrence.

If you require any additional information, please so advise.

Sincerely,

Enclosure: LER No. 89-009

cc: F. R. Huey (USNRC Senior Resident Inspector, Units 1, 2 and 3)  
J. B. Martin (Regional Administrator, USNRC Region V)  
Institute of Nuclear Power Operations (INPO)

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# LICENSEE EVENT REPORT (LER)

Facility Name (1) SAN ONOFRE NUCLEAR GENERATING STATION, UNIT 2						Docket Number (2) 0   5   0   0   0   3   6   1						Page (3) 1   of   0   6		
Title (4) INOPERABLE SNUBBERS IDENTIFIED ON COMPONENT COOLING WATER AND SAFETY INJECTION LINES														

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	Docket Number(s)	
0   5	2   3	8   9	8   9	0   0   9	0   0	0   6	2   2	8   9	NONE	0   5   0   0   0	
OPERATING MODE (9) 5			THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10CFR (Check one or more of the following) (11)								
POWER LEVEL (10) 0   0   0			20.402(b)		20.405(c)		50.73(a)(2)(iv)		73.71(b)		
			20.405(a)(1)(i)		50.36(c)(1)		50.73(a)(2)(v)		73.71(c)		
			20.405(a)(1)(ii)		50.36(c)(2)		50.73(a)(2)(vii)		Other (Specify in		
			20.405(a)(1)(iii)		50.73(a)(2)(i)		50.73(a)(2)(viii)(A)		Abstract below and		
			20.405(a)(1)(iv)		50.73(a)(2)(ii)		50.73(a)(2)(viii)(B)		in text)		
			20.405(a)(1)(v)		50.73(a)(2)(iii)		50.73(a)(2)(x)				

LICENSEE CONTACT FOR THIS LER (12)														
Name H. E. Morgan, Station Manager										TELEPHONE NUMBER 7   1   4   3   6   8   -   6   2   4   1				

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)														
CAUSE	SYSTEM	COMPONENT	MANUFAC-TURER	REPORTABLE TO NPRDS	CAUSE	SYSTEM	COMPONENT	MANUFAC-TURER	REPORTABLE TO NPRDS					

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)

On May 23, 1989, with Unit 2 in Mode 5, during a routine 18-month TS surveillance of safety related mechanical snubbers, three snubbers in containment were found to be inoperable. Two of the snubbers, located on the Component Cooling Water supply line to a Reactor Coolant Pump (RCP) motor oil cooler, were found frozen. In addition, one of these was found unpinned. The third snubber, located on a Safety Injection (SI) line, was found unpinned.

On June 6, 1989 at 1000, during an unrelated walk down in containment, a safety related mechanical snubber located on a SI line was also found partially unpinned.

Investigation has determined that the snubber unpinning was caused by the detachment of a snap ring on each of the affected snubbers. SCE had previously identified that a tendency exists for snap rings to become detached on the smaller size snubbers that are located on lines that experience vibration. A program had been implemented to replace the spring clips on snubbers that fit the above category with a cotter type load pin which is less susceptible to becoming detached. The subject snubbers became unpinned prior to performance of this replacement.

Investigation also determined that one snubber became frozen due to an excessive side loading, while the other snubber became frozen due to vibration associated with being in close proximity to a RCP.

For corrective action, the two frozen snubbers were replaced with operable snubbers. Cotter restraining pins were installed in the two unpinned snubbers. Additionally, the snubber which had been found partially unpinned had a new spring clip installed.

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Plant: San Onofre Nuclear Generating Station  
Unit: Two  
Reactor Vendor: Combustion Engineering  
Event Date: 05-23-89  
Time: 0900

A. CONDITIONS AT TIME OF THE EVENT:

Mode: 5, Cold Shutdown  
RCS Temperature: 106 Degrees Fahrenheit

B. BACKGROUND INFORMATION:

Mechanical snubbers [SNB] are designed to prevent shock forces from damaging attached components and system piping. The snubbers also function to accommodate for thermal transients in system piping. Snubbers are restrained at both ends by a load pin which is, in turn, secured in place by means of either a snap ring (spring clip) or a cotter pin.

Technical Specification (TS) 3.7.6 requires that all safety-related snubbers be operable in Modes 1-4 (Modes 5 and 6 for snubbers located on systems required operable in those modes). The TS action statement requires that with one or more snubbers inoperable, within 72 hours replace or restore the inoperable snubber(s) to operable status and perform an engineering evaluation. The purpose of the engineering evaluation is to determine if the components to which the inoperable snubber(s) were attached were adversely affected and to ensure that the component remained capable of meeting its design function.

C. DESCRIPTION OF THE EVENT:

1. Event:

- a. On May 23, 1989, with Unit 2 in Mode 5, during a routine 18-month TS surveillance of safety related mechanical snubbers, three snubbers in containment were found to be inoperable as described below.

At 0900, snubber S2-SI-064-H-007, located on a 1" line off the loop 1B Safety Injection (SI) [BQ] line, was found to be unpinned at one end. The snubber was stroke tested for operability and then repinned. The stroke test demonstrated the snubber to be operable. Snubbers in the same area on the affected SI line were visually inspected and found to be operable.

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At 0930, snubber S2-CC-082-H-007, located on the Component Cooling Water (CCW) [CC] supply line to Reactor Coolant Pump (RCP) [AB] motor oil cooler was found to be unpinned and subsequently determined to be frozen. The snubber was replaced with an operable snubber. As a result of the failure, 18 other snubbers in the same area were stroked in accordance with TS 4.7.6.g. As a result of the stroking, another snubber S2-CC-082-H-011, located on the same CCW line, was found to be frozen. The snubber was replaced with an operable snubber.

- b. On June 6, 1989 at 1000, during a walk down in containment that was unrelated to item C.1.a, SI mechanical snubber S2-SI-155-H-001 was found partially unpinned. The snubber was stroke tested for operability and then repinned. The stroke test demonstrated the snubber to be operable.

2. Inoperable Structures, Systems or Components that Contributed to the Event:  
None.

3. Sequence of Events:

<u>DATE</u>	<u>TIME</u>	<u>ACTION</u>
5/23/89	0900	SI mechanical snubber S2-SI-064-H-007 found to be unpinned.
5/23/89	0930	CCW mechanical snubber S2-CC-082-H-007 found to be unpinned and subsequently determined to be frozen.
5/24/89	1152	CCW mechanical snubber S2-CC-082-H-011 determined to be frozen.
6/6/89	1000	SI mechanical snubber S2-SI-155-H-001 found to be partially unpinned.

4. Method of Discovery:

As described in the above description of the event.

5. Personnel Actions and Analysis of Actions:

Not Applicable.

6. Safety System Responses:

Not Applicable.

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D. CAUSE OF THE EVENT:

1. Immediate Cause:

Investigation into the cause of the inoperable snubbers has determined that:

- a. Due to system vibration, the snap ring on snubber S2-SI-064-H-007 had become detached allowing the snubber to subsequently become unpinned.
- b. Due to system vibration, the snap ring on snubber S2-CC-082-H-007 had become detached allowing the snubber to subsequently become unpinned. Also, the snubber had become frozen due to an excessive side loading.
- c. Snubber S2-CC-082-H-011 had become frozen due to system vibration.
- d. Due to system vibration, the snap ring on snubber S2-SI-155-H-001 had become detached allowing the snubber to subsequently become partially unpinned.

2. Root Cause:

In 1987, SCE identified that snubber load pin retaining snap rings (spring clips) on smaller size snubbers (PSA 1/4, 1/2) that are located on lines that experience vibration have a tendency, over time, to become detached. At that time, SCE implemented a program to replace the spring clips with cotter type load pins on snubbers that fit the above category. These replacements were being performed in conjunction with the TS functional surveillance. Experience has shown that snubber unpinning due to vibration has been substantially reduced in cases where cotter pins have been installed.

Presently, approximately 25 percent of the snubbers in this program have had their cotter pins installed. However, the failures of snubbers S2-SI-064-H-007 and S2-CC-082-H-007 occurred prior to the replacement of their spring clips with the cotter type load pins. Snubber S2-SI-155-H-001 (PSA-1) is a larger type snubber and, therefore, is not part of this program. The failure of the PSA-1 type snubber due to snap ring detachment is the first occurrence at SONGS.

Additionally, snubber S2-CC-082-H-007 was determined to be frozen due to an excessive side loading. It is believed that this loading was not caused by piping system movement, but rather by the snubber either being stepped on or bumped by an object.

Lastly, inspection of snubber S2-CC-082-H-011, after it had failed its stroke test, indicates that the failure was caused by vibration associated with being in close proximity to a RCP.

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E. CORRECTIVE ACTIONS:

1. Corrective Actions Taken:

- a. The two frozen snubbers (S2-CC-082-H-007 and S2-CC-082-H-011) were replaced with operable snubbers.
- b. Cotter pins were installed in the two unpinned snubbers (S2-SI-064-H-007 and S2-CC-082-H-007). Additionally, snubber S2-SI-155-H-001, which had been found partially unpinned, had a new spring clip installed. A spring clip was installed, verses a cotter pin, due to the unavailability of a cotter pin for this size snubber (PSA-1).
- c. Additional snubbers in the area of the failed snubbers were inspected/tested for operability as required by TS. No other snubber failures beyond snubber S2-CC-082-H-011 were identified.
- d. The side loading of snubber S2-CC-082-H-007 occurred sometime after it was last successfully inspected in October 1987. In late 1988, signs which specifically state not to use installed snubbers as steps or hand holds, along with other precautions, were installed at the entrance of containment and on each level of containment. It is expected that the installation of these signs, as well as others at various plant locations, will increase personnel awareness of the importance and sensitivity of snubbers.

2. Planned Corrective Actions:

- a. The failed snubbers will be factored into the service life monitoring program, which trends snubber testing and replacement in order to predict the service life of a given snubber. In this manner, snubber replacement can be performed prior to exceeding the normal service life of that snubber.
- b. The spring clip on snubber S2-SI-155-H-001 will be replaced with a cotter pin at the next Unit 2 outage. In addition, it is planned to replace a majority of the PSA 1/4 and PSA 1/2 snubber spring clips with cotter pins at the next refueling outage for each of Units 2 and 3.
- c. It is currently planned to replace snubbers S2-CC-082-H-007 and S2-CC-082-H-011 at the next Unit 2 refueling outage. At that time, their snubber service life will be re-evaluated.

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F. SAFETY SIGNIFICANCE OF THE EVENT:

There is no safety significance to this event since:

1. The engineering evaluation performed for inoperable snubbers S2-CC-082-H-007, S2-CC-082-H-011, S2-SI-064-H-007 in the "as found" condition concluded that no piping damage occurred as all system stresses were within FSAR limits, and that the systems to which the inoperable snubbers were attached would have performed their intended safety functions during a Design Basis Earthquake (DBE).
2. The partially unpinned snubber S2-SI-155-H-001 was found to stroke freely through its full range of travel and, therefore, the affect of thermal expansion of the piping is not a concern. An engineering evaluation to determine whether the disconnection of the snubber would have affected the operability of the Safety Injection piping is in progress. Based on a preliminary review of this condition, it is believed that the system would have remained fully operable during a DBE. If the evaluation does not confirm this conclusion, a revision to this LER will be submitted.

G. ADDITIONAL INFORMATION:

1. Component Failure Information:

Not Applicable.

2. Previous LERs for Similar Events:

LER 2-84-079 Revision 1, reported several snubber deficiencies caused by vibration which were identified during the Unit 2 18-month TS surveillance. Corrective action was to measure the operational system vibration frequencies where possible and to compare them to vendor supplied data to more accurately determine the approximate life span of snubbers operating in these conditions. In addition, where appropriate, supports less susceptible to vibration damage were evaluated.

The four snubbers discussed herein were not included in this program due to their inaccessibility during operating conditions likely to produce vibration.

3. Results of NPRDS Search:

No useful information was found.