

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Palo Verde Unit 1	DOCKET NUMBER (2) 0 5 0 0 0 5 2 8	PAGE (3) 1 OF 0 9
---	---	-----------------------------

TITLE (4)
Snubber Testing not in Accordance with Technical Specifications

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)	
									Palo Verde Unit 2	0 5 0 0 0 5 2 9	
0 4 3 0 9 3	9 3	0 0 7 0 2 0 7 2 8 9 3							Palo Verde Unit 3	0 5 0 0 0 5 3 0	

OPERATING MODE (9) **1**

POWER LEVEL (10) **1 0 0**

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)

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)(vi)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)
20.405(a)(1)(iii)	<input checked="" type="checkbox"/> 50.73(a)(2)(i)	50.73(a)(2)(vii)(A)	
20.405(a)(1)(iv)	50.73(a)(2)(ii)	50.73(a)(2)(vii)(B)	
20.405(a)(1)(v)	50.73(a)(2)(iii)	50.73(a)(2)(v)	

LICENSEE CONTACT FOR THIS LER (12)

NAME Thomas R. Bradish, Manager, Nuclear Regulatory Affairs	TELEPHONE NUMBER
	AREA CODE 6 0 2 3 9 3 - 5 4 2 1

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

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC

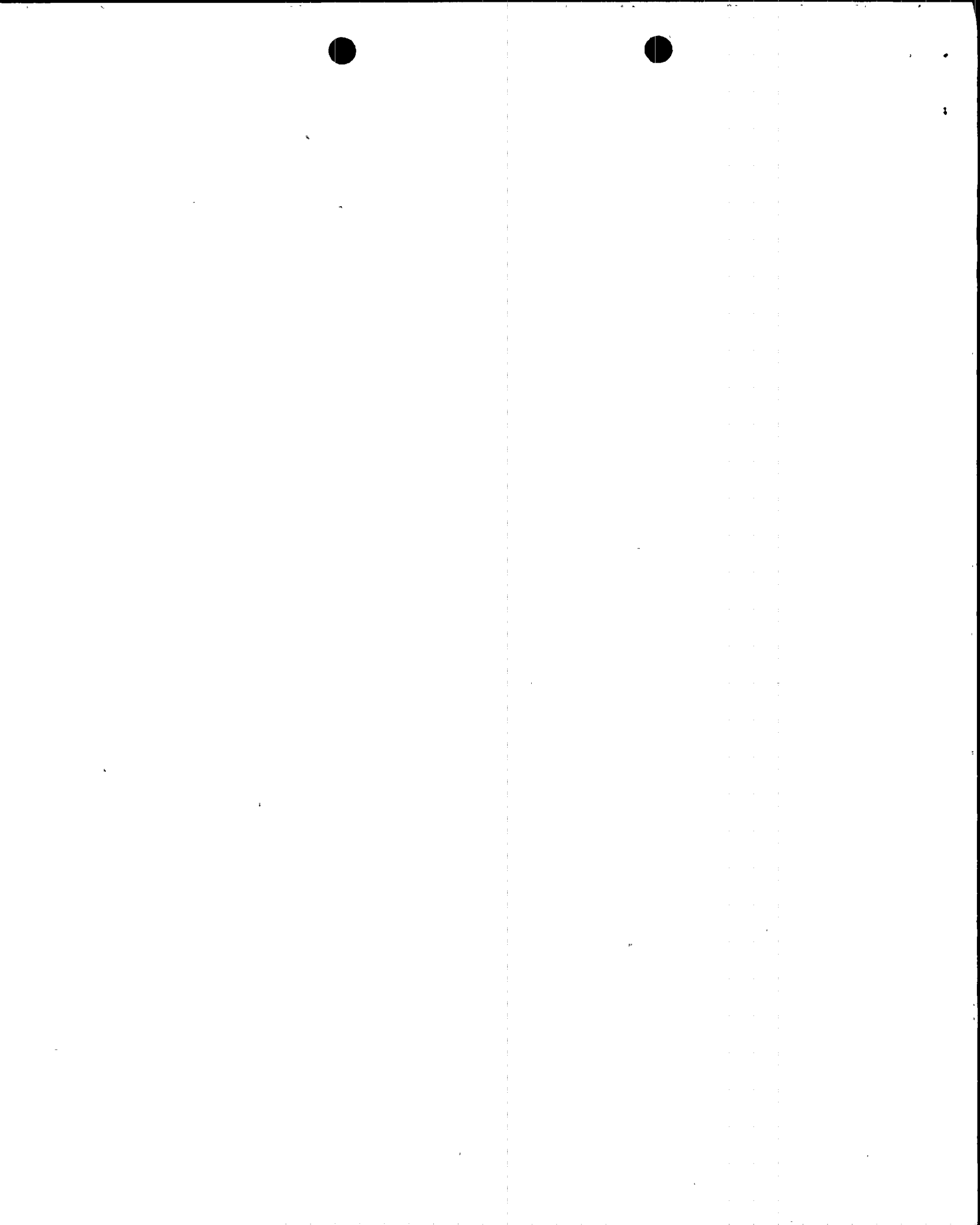
SUPPLEMENTAL REPORT EXPECTED (14)		EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
YES (If yes, complete EXPECTED SUBMISSION DATE)	<input checked="" type="checkbox"/> NO				

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

On May 12, 1993, at approximately 1330 MST, APS Management and the NRC discussed APS' interpretation of Technical Specification 4.7.9.e, for snubber testing. APS concluded that it had incorrectly interpreted the Technical Specification. Additionally, APS had not informed the NRC Regional Administrator that the surveillance requirement would be implemented differently than previously identified.

Palo Verde Units 1, 2, and 3 entered the ACTION for Limiting Condition for Operation 3.7.9, at approximately 1330 MST on May 12, 1993, and a Notice of Enforcement Discretion was requested. At approximately 1400 MST on May 14, 1993, APS was notified of the Commission's intent to exercise discretion in enforcing compliance with the ACTION statement of TS 3.7.9, until the NRC takes action on a request for a license amendment.

There have been no previous similar events reported pursuant to 10CFR50.73.



LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME	DOCKET NUMBER	LER NUMBER			PAGE		
Palo Verde Unit 1		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
		0	5	0	0	0	5
		8	9	3	-	0	0
			7	-	0	2	0
					0	2	OF 0
							9

TEXT

I. DESCRIPTION OF WHAT OCCURRED:

A. Initial Conditions:

At approximately 1330 MST on May 12, 1993, Palo Verde Units 1 and 3 were in Mode 1 (POWER OPERATION) operating at 100 percent power. Unit 2 was in Mode 6 (REFUELING) with cold loop temperature at approximately 87 degrees Fahrenheit.

B. Reportable Event Description (Including Dates and Approximate Times of Major Occurrences):

Event Classification: Operation prohibited by the plant's Technical Specifications.

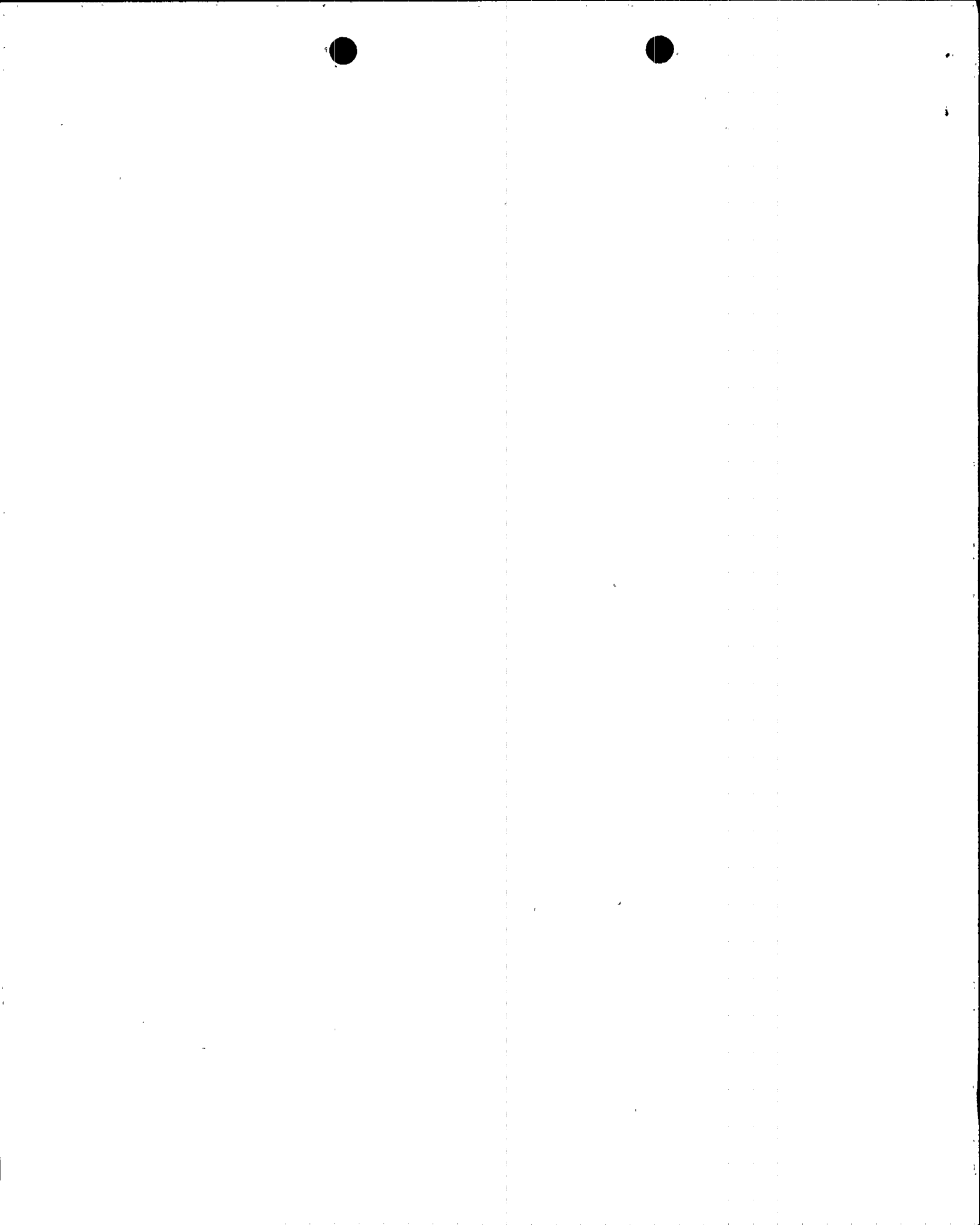
On May 12, 1993, APS Management (utility, non-licensed) and the NRC discussed APS' interpretation of Technical Specification (TS) Surveillance Requirement (SR) 4.7.9.e. APS concluded that it had incorrectly interpreted TS SR 4.7.9.e. Additionally, APS had not informed the NRC Regional Administrator that snubber testing would be implemented differently than previously identified. At approximately 1330 MST on May 12, 1993, Palo Verde Units 1, 2, and 3 entered the ACTION for Limiting Condition for Operation (LCO) 3.7.9.

TS LCO 3.7.9, states in part "...all hydraulic and mechanical snubbers shall be operable...." [Snubbers on non-safety systems may be excluded if their failure does not adversely affect safety-related systems.] The requirement is applicable in all MODEs for snubbers located on systems required to be OPERABLE in that MODE. The LCO ACTION states in part "...with one or more snubbers inoperable on any system, within 72 hours replace or restore the inoperable snubber(s) to OPERABLE status...or declare the attached system inoperable...follow the ACTION statement for that system."

SR 4.7.9, states in part "...each snubber shall be demonstrated OPERABLE by performance of the following augmented inservice inspection program and the requirements of SR 4.0.5."

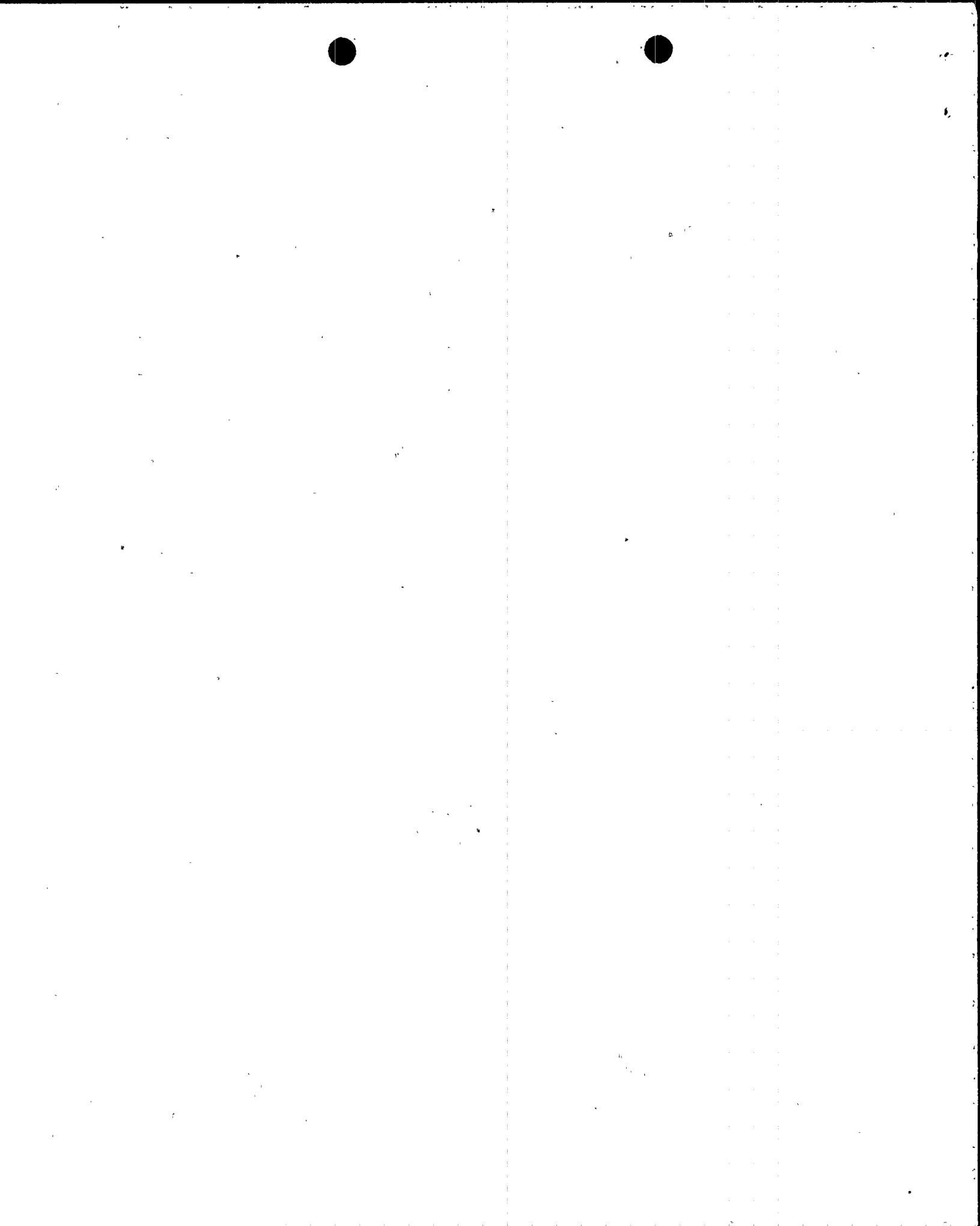
4.7.9.a. defines Snubber Type as "...of the same design and manufacturer, irrespective of capacity...." [The PVNGS Snubber Testing program identifies 5 snubber groups. The program was implemented with three snubber types: PSA mechanical, Steam Generator hydraulic, and Reactor Coolant Pump hydraulic.]

4.7.9.e. States in part "...snubbers shall be tested using one of the following sample plans. The sample plan shall



LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME	DOCKET NUMBER	LER NUMBER			PAGE		
Palo Verde Unit 1		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
		9	3	0	0	7	0
		0	5	0	0	5	2
		0	5	0	0	5	2
		9	3	0	0	7	0
		0	5	0	0	5	2
		9	3	0	0	7	0
		0	5	0	0	5	2
		9	3	0	0	7	0
		0	5	0	0	5	2
		9	3	0	0	7	0
		0	5	0	0	5	2
		9	3	0	0	7	0
		0	5	0	0	5	2
		9	3	0	0	7	0
		0	5	0	0	5	2
		9	3	0	0	7	0
		0	5	0	0	5	2
		9	3	0	0	7	0
		0	5	0	0	5	2
		9	3	0	0	7	0
		0	5	0	0	5	2
		9	3	0	0	7	0
		0	5	0	0	5	2
		9	3	0	0	7	0
		0	5	0	0	5	2
		9	3	0	0	7	0
		0	5	0	0	5	2
		9	3	0	0	7	0
		0	5	0	0	5	2
		9	3	0	0	7	0
		0	5	0	0	5	2
		9	3	0	0	7	0
		0	5	0	0	5	2
		9	3	0	0	7	0
		0	5	0	0	5	2
		9	3	0	0	7	0
		0	5	0	0	5	2
		9	3	0	0	7	0
		0	5	0	0	5	2
		9	3	0	0	7	0
		0	5	0	0	5	2
		9	3	0	0	7	0
		0	5	0	0	5	2
		9	3	0	0	7	0
		0	5	0	0	5	2
		9	3	0	0	7	0
		0	5	0	0	5	2
		9	3	0	0	7	0
		0	5	0	0	5	2
		9	3	0	0	7	0
		0	5	0	0	5	2
		9	3	0	0	7	0
		0	5	0	0	5	2
		9	3	0	0	7	0
		0	5	0	0	5	2
		9	3	0	0	7	0
		0	5	0	0	5	2
		9	3	0	0	7	0
		0	5	0	0	5	2
		9	3	0	0	7	0
		0	5	0	0	5	2
		9	3	0	0	7	0
		0	5	0	0	5	2
		9	3	0	0	7	0
		0	5	0	0	5	2
		9	3	0	0	7	0
		0	5	0	0	5	2
		9	3	0	0	7	0
		0	5	0	0	5	2
		9	3	0	0	7	0
		0	5	0	0	5	2
		9	3	0	0	7	0
		0	5	0	0	5	2
		9	3	0	0	7	0
		0	5	0	0	5	2
		9	3	0	0	7	0
		0	5	0	0	5	2
		9	3	0	0	7	0
		0	5	0	0	5	2
		9	3	0	0	7	0
		0	5	0	0	5	2
		9	3	0	0	7	0
		0	5	0	0	5	2
		9	3	0	0	7	0
		0	5	0	0	5	2
		9	3	0	0	7	0
		0	5	0	0	5	2
		9	3	0	0	7	0
		0	5	0	0	5	2
		9	3	0	0	7	0
		0	5	0	0	5	2
		9	3	0	0	7	0
		0	5	0	0	5	2
		9	3	0	0	7	0
		0	5	0	0	5	2
		9	3	0	0	7	0
		0	5	0	0	5	2
		9	3	0	0	7	0
		0	5	0	0	5	2
		9	3	0	0	7	0
		0	5	0	0	5	2
		9	3	0	0	7	0
		0	5	0	0	5	2
		9	3	0	0	7	0
		0	5	0	0	5	2
		9	3	0	0	7	0
		0	5	0	0	5	2
		9	3	0	0	7	0
		0	5	0	0	5	2
		9	3	0	0	7	0
		0	5	0	0	5	2
		9	3	0	0	7	0
		0	5	0	0	5	2
		9	3	0	0	7	0
		0	5	0	0	5	2
		9	3	0	0	7	0
		0	5	0	0	5	2
		9	3	0	0	7	0
		0	5	0	0	5	2
		9	3	0	0	7	0
		0	5	0	0	5	2
		9	3	0	0	7	0
		0	5	0	0	5	2
		9	3	0	0	7	0
		0	5	0	0	5	2
		9	3	0	0	7	0
		0	5	0	0	5	2
		9	3	0	0	7	0
		0	5	0	0	5	2
		9	3	0	0	7	



LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME	DOCKET NUMBER	LER NUMBER			PAGE		
Palo Verde Unit 1		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
	0 5 0 0 0 5 2 8 9 3	-	0 0 7	-	0 2	0 4	OF 0 9

TEXT

few number of hydraulic snubbers, specific steam generator (AB)(SG) snubbers and Reactor Coolant Pump (AB)(RCP) snubbers were scheduled to be tested each outage.]

The PVNGS Snubber Testing Program is described in Administrative Control Procedure 73AC-9ZZ01 "Testing and Control of PVNGS Snubbers." This procedure describes the five (5) snubber groups as follows:

- PSA 1/4 and 1/2 size Mechanical Snubbers (small)
- PSA 1, 3, and 10 size Mechanical Snubbers (medium)
- PSA 35 and 100 size Mechanical Snubbers (large)
- SG Hydraulic Snubbers
- RCP Hydraulic Snubbers

Mechanical Snubbers

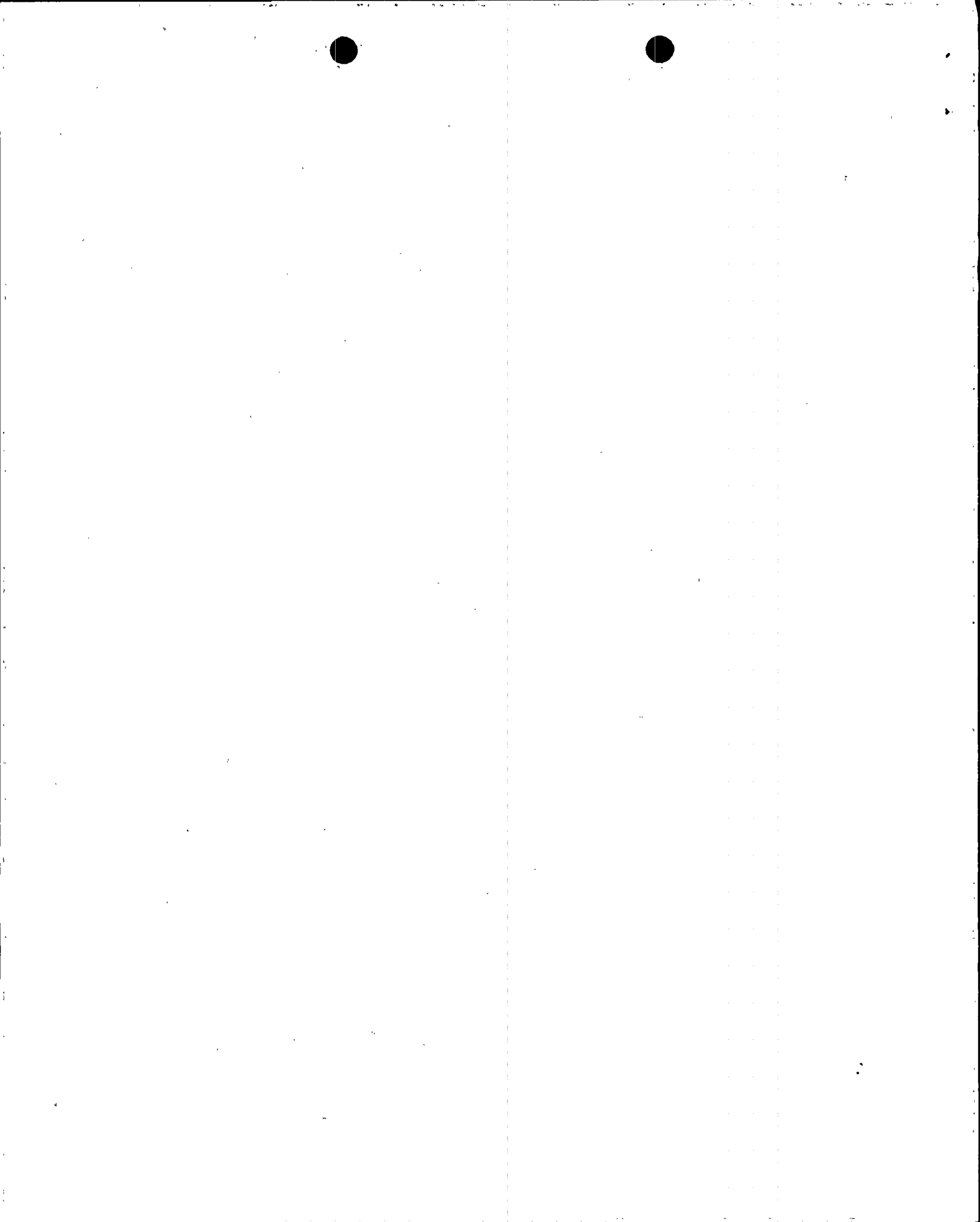
PVNGS implemented the mechanical snubber testing program by treating all mechanical snubbers as one type with three groups: small, medium, and large. PVNGS believed this was a correct interpretation since all mechanical snubbers at PVNGS are Pacific Scientific Arrestors (PSA). The PVNGS program considered all sizes to have the same design features. This is contrary to the requirements of TS SR 4.7.9.e.

Hydraulic Snubbers

Each unit has 12 hydraulic snubbers, four (4) SG and eight (8) RCP. To implement TS SR 4.7.9.e.2, as docketed to the Regional Administrator, all 12 hydraulic snubbers would require testing each outage. PVNGS tested only one of each type (2 total) during each outage. PVNGS did not notify the Regional Administrator that PVNGS procedures implemented a test plan meeting SR 4.7.9.e.1, except for random sample requirements.

Sample Selection

Although the selection of mechanical snubbers for testing at PVNGS was representative, it was not completely random. Snubbers that failed the acceptance criteria were repaired or replaced and retested during the next testing period as required. Snubbers that tested acceptable were not placed back into the population for possible selection during a subsequent test period. Although the method used by PVNGS would ensure all snubbers would eventually be tested, it did



LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME	DOCKET NUMBER	LER NUMBER			PAGE		
Palo Verde Unit 1		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
		0500052893	007	02	05	OF	09

TEXT

not meet the random selection criteria.

Hydraulic snubbers are scheduled for testing so that in 8 outages, the entire population of SG snubbers is tested twice and the entire population of RCP snubbers is tested once. This was done to ensure all snubbers are tested while maintaining radiation exposures As Low As Reasonably Achievable (ALARA).

- C. Status of structures, systems, or components that were inoperable at the start of the event that contributed to the event:

Other than the snubbers identified in Section I.B., that were administratively inoperable due to improperly interpreting the TS SR, no other structures, systems, or components were inoperable at the start of the event which contributed to this event.

- D. Cause of each component or system failure, if known:

This LER identifies a program failure and not an equipment failure. All snubbers which failed surveillance testing were repaired or replaced and retested as required. No component or system failures were involved.

- E. Failure mode, mechanism, and effect of each failed component, if known:

Failures of snubbers fall into five general modes as discussed below:

- Design or Manufacturing -

Failures resulting from a potential defect in manufacturing or design that gives cause to suspect other snubbers. This includes failures of any snubber that fails to withstand the environment or application for which it was designed.

- Application induced -

Failures resulting from environmental conditions or application of the snubber for which it has not been designed or qualified.

- Maintenance, Repair, or Installation -

Failures that result from damage during maintenance, repair, or installation activities, the nature of



LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME	DOCKET NUMBER	LER NUMBER			PAGE		
Palo Verde Unit 1		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
	0 5 0 0 0 5 2 8 9 3	-	0 0 7	-	0 2	0 6	OF 0 9

TEXT

which causes other snubbers to be suspect.

- Isolated -

The nature of the failure does not lend other snubbers to be suspect, for example, failures resulting from damage during installation (i.e., missing pins, dropping equipment or tools on the snubber).

- Unexplained -

Failures that can not be categorized as design or manufacturing, maintenance, repair, installation, application induced, or isolated. This category includes all failures for which the cause of the failure can not be determined.

There are three mechanisms of failure:

- Breakaway or Drag -

The force that will initiate motion or the force that will maintain low velocity displacement respectively. Lockup is a breakaway or drag failure which exceeds 20 percent of rated load.

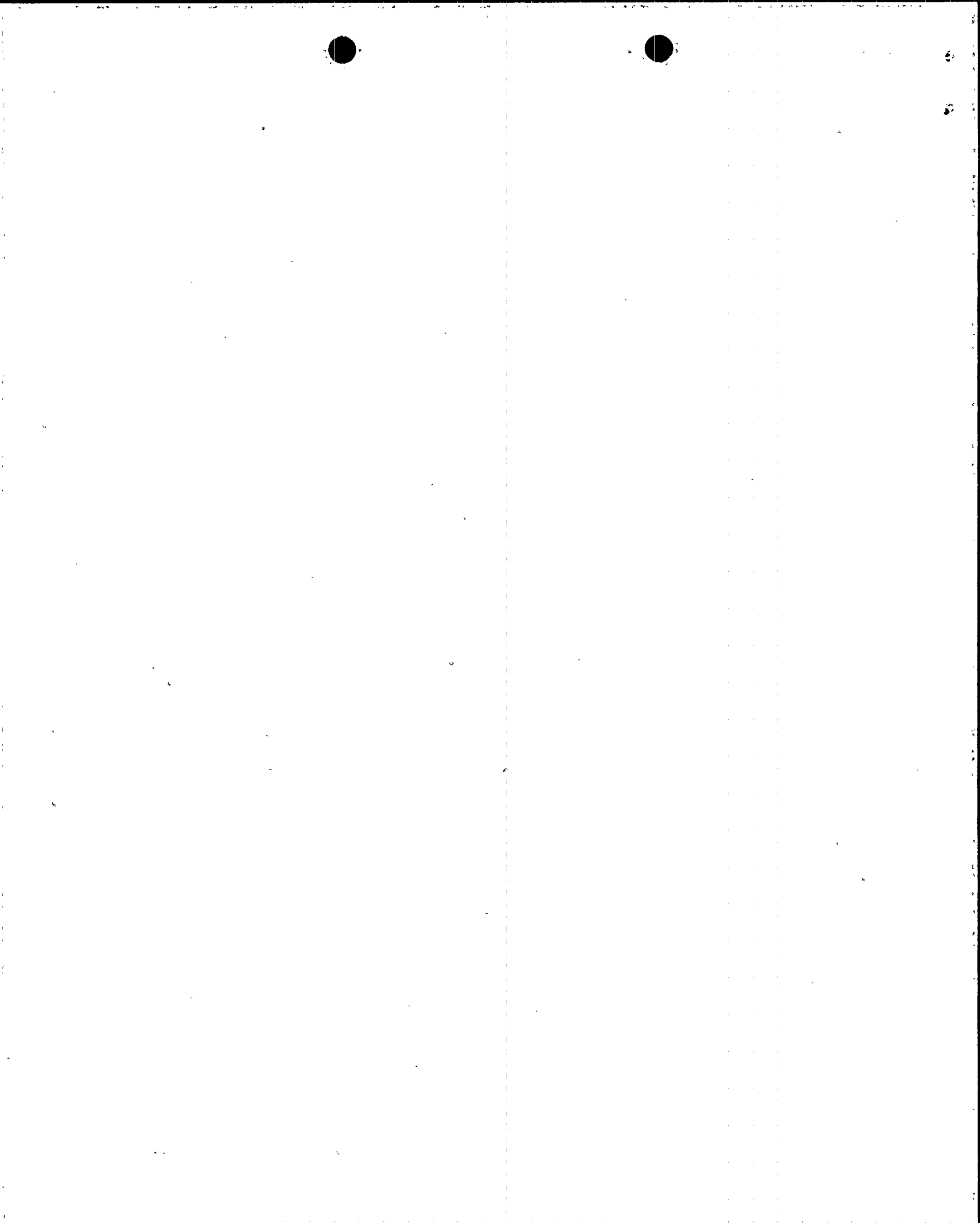
- Activation -

The function of a snubber that restrains movement when undergoing telescoping acceleration.

- Release Rate -

The rate of axial snubber movement under load after activation (applicable to hydraulic snubbers only).

An evaluation is performed for snubbers which fail the functional test acceptance criteria. This evaluation determines if systems or components to which the snubbers were attached could be damaged due to the inoperable snubber. There has only been one area identified where the calculated stresses exceeded those allowed by the American Society of Mechanical Engineers (ASME) Code. This occurred on Reactor Coolant System Drain Lines RC070 and RC071. Failures of snubbers on these lines occurred in Units 2 and 3. Lines RC070 and RC071 were visually and nondestructively tested. No abnormal conditions or indications of overstressing were found. Inspection of piping and supports revealed that no damage had occurred.



LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME	DOCKET NUMBER	LER NUMBER			PAGE		
Palo Verde Unit 1		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
	0 5 0 0 0 5 2 8	9 3	- 0 0 7	- 0 2	0 7	OF	0 9

TEXT

- F. For failures of components with multiple functions, list of systems or secondary functions that were also affected:

Not applicable - no failures of components with multiple functions were involved.

- G. For a failure that rendered a train of a safety system inoperable, estimated time elapsed from the discovery of the failure until the train was returned to service:

Not applicable - no failures that rendered a train of a safety system inoperable were involved.

- H. Method of discovery of each component or system failure or procedural error:

Unit 2 was in a refueling outage performing required snubber testing. Because of the Unit 2 snubber failures, an increase in sampling was required. During the selection of the additional snubbers by APS Engineering personnel (utility, non-licensed), the NRC Resident Inspector (non-utility, non-licensed) questioned the selection methodology and TS testing requirements. Subsequently, as discussed in Section I.B, APS concluded that it had incorrectly interpreted the Technical Specification.

- I. Cause of Event:

This condition was caused by incorrectly interpreting TS SR 4.7.9.e, and failing to recognize and inform the NRC Regional Administrator that the SR would be implemented differently from previously identified (SALP Cause Codes A: Personnel Error).

This incident is being investigated in accordance with the APS Incident Investigation Program. If information is developed which would affect the reader's understanding or perception of this event, a supplement will be submitted.

- J. Safety System Response:

Not applicable - there were no safety system responses and none were necessary.

- K. Failed Component Information:

Pacific Scientific Arrestor

Models PSA-1/4, PSA-1/2, PSA-1, PSA-3, PSA-10, PSA-35, and PSA-100



LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME	DOCKET NUMBER	LER NUMBER			PAGE		
Palo Verde Unit 1		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
		93	007	02	08	OF	09

TEXT

II. ASSESSMENT OF THE SAFETY CONSEQUENCES AND IMPLICATIONS OF THIS EVENT:

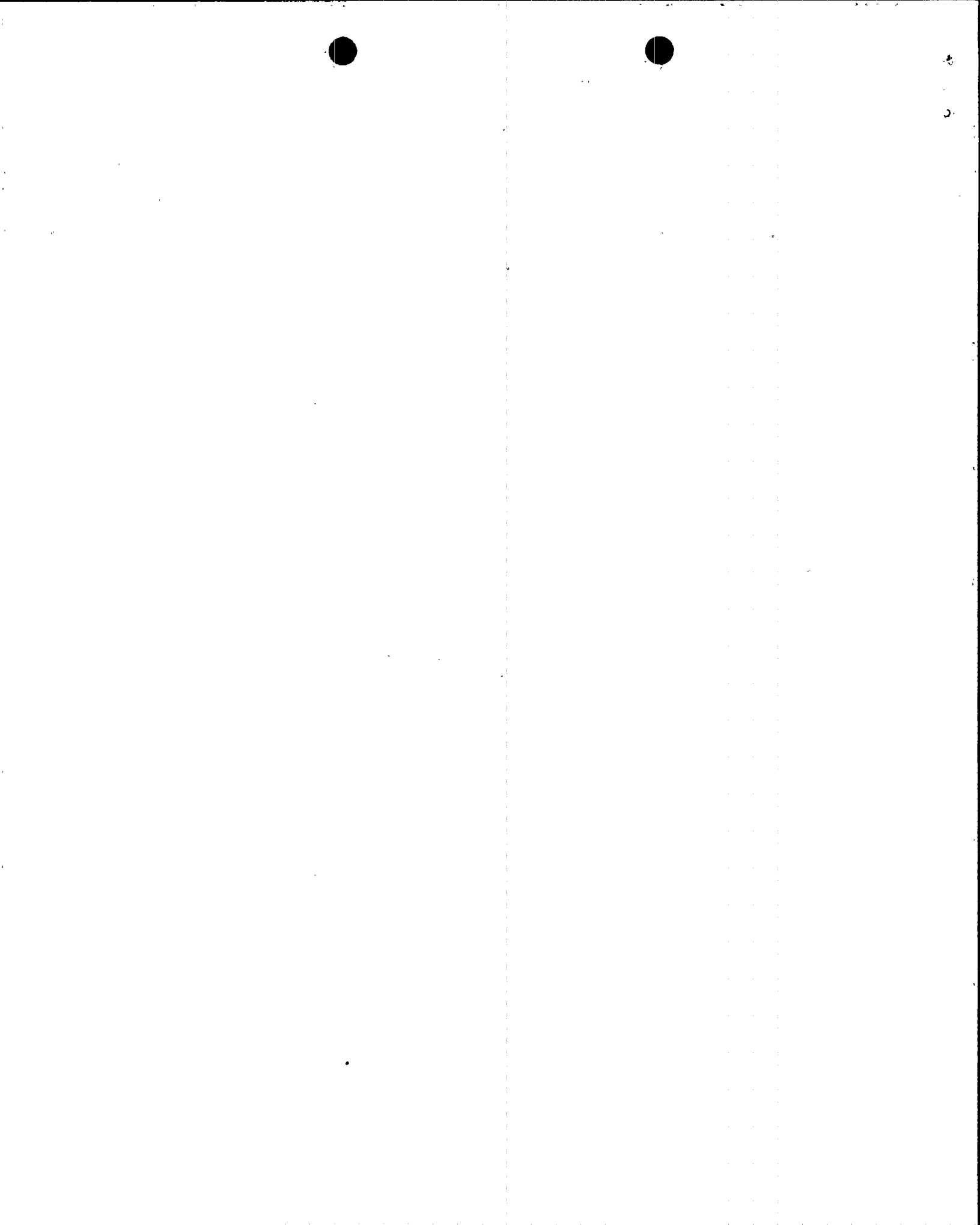
No release of radiological effluent or exposure to member(s) of the public resulted from this event. APS Engineering personnel have completed a review of the previous snubber testing conducted at PVNGS and concluded that sufficient testing was performed to assure that the snubbers can perform their intended function.

APS has concluded there is no significant safety implications to operating PVNGS' Units 1, 2, and 3 as a result of the noncompliance with TS SR 4.7.9.e. The purpose of snubbers is to protect the piping systems during seismic events while allowing thermal growth without overstressing the piping. For snubbers not meeting the acceptance criteria during testing, stress calculations have been performed to determine if imposed stresses exceeded Code allowable stresses. This was performed with the snubbers in the as-found condition. With the exception of the Reactor Coolant System Drain Lines RC070 and RC071, APS Engineering personnel determined that the piping was not overstressed and that the snubbers, while degraded, did not challenge the operability of piping or components. Lines RC070 and RC071 were visually and nondestructively examined. No abnormal conditions or indications of overstressing were found. Therefore, the consequences are no different than previously analyzed in the PVNGS Updated Final Safety Analysis Report for snubber failures. The probability and types of failures remain the same.

III. CORRECTIVE ACTION:

A. Immediate:

In accordance with TS 4.0.3., failure to perform a surveillance requirement constitutes noncompliance with the OPERABILITY requirements for a LCO and requires the entry into the associated ACTION statement. As discussed above, PVNGS entered the ACTION statement for TS 3.7.9., at approximately 1330 MST on May 12, 1993. This 72 hour action period would have ended at approximately 1330 MST on May 15, 1993, when PVNGS' Unit 1 and Unit 3 would have been required to shutdown in accordance with TS 3.0.3. A Notice of Enforcement Discretion from PVNGS' Unit 1, 2, and 3 TS Limiting Condition for Operation ACTION statement was requested from and subsequently granted by the Commission at approximately 1400 MST on May 14, 1993.



LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME	DOCKET NUMBER	LER NUMBER			PAGE	
Palo Verde Unit 1		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
	0 5 0 0 0 5 2 8 9 3	-	0 0 7	-	0 2	0 9 OF 0 9

TEXT

B. Action to Prevent Recurrence:

The PVNGS Snubber Testing program will be revised to correctly implement the TS requirements prior to commencing the next testing cycle.

An investigation of this event is being conducted according to the APS Incident Investigation Program. Additional actions to prevent recurrence may be identified based upon the results of the investigation. If additional actions are identified which would affect the reader's understanding or perception of this event, a supplement will be submitted.

IV. PREVIOUS SIMILAR EVENTS:

There have been no previous similar events reported pursuant to 10CFR50.73.

V. ADDITIONAL INFORMATION

References

- (1) Letter 161-00296, dated June 22, 1987, from J.G. Haynes, APS to Mr. John B. Martin, USNRC. Subject: Functional Testing of Snubbers. [Unit 1]
- (2) Letter 161-00469, dated August 31, 1987, from J.G. Haynes, APS to Mr. John B. Martin, USNRC. Subject: Functional Testing of Snubbers. [Unit 2]
- (3) Letter 161-01612, dated January 12, 1989, from D. B. Karner, APS to the Document Control Desk. Subject: Functional Testing of Snubbers. [Unit 3]

