

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 1	PAGE (3) 1 OF 0 3
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TITLE (4)
REACTOR VESSEL CAVITY SEAL RING HORIZONTAL SEAL FAILURE

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)		
MONTH	DAY	YEAR	YEAR	SEQ. NUMBER	REV. NUMBER	MONTH	DAY	YEAR	FACILITY NAMES		DOCKET NUMBER(S)
11	05	84	84	0710	010	02	07	85			0 5 0 0 0 0 0 0 0 0

OPERATING MODE (9) 6	POWER LEVEL (10) 0 0 0	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)																				
		<input type="checkbox"/> 20.402(b)	<input type="checkbox"/> 20.405(a)(1)(i)	<input type="checkbox"/> 20.405(a)(1)(ii)	<input type="checkbox"/> 20.405(a)(1)(iii)	<input type="checkbox"/> 20.405(a)(1)(iv)	<input type="checkbox"/> 20.405(a)(1)(v)	<input type="checkbox"/> 20.405(c)	<input type="checkbox"/> 50.36(c)(1)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(i)	<input type="checkbox"/> 50.73(a)(2)(ii)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(iv)	<input type="checkbox"/> 50.73(a)(2)(v)	<input type="checkbox"/> 50.73(a)(2)(vii)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)	<input type="checkbox"/> 50.73(a)(2)(x)	<input type="checkbox"/> 73.71(b)	<input type="checkbox"/> 73.71(c)	<input checked="" type="checkbox"/> OTHER (Specify in Abstract below and in Text, NRC Form 366A)
INFORMATIONAL REPORT																						

LICENSEE CONTACT FOR THIS LER (12)

NAME J. G. HAYNES, STATION MANAGER	TELEPHONE NUMBER AREA CODE: 7 1 1 4 4 9 2 - 7 7 0 0
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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
B	CF	SEAL	P3710	N					

SUPPLEMENTAL REPORT EXPECTED (14)

<input type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE)	<input checked="" type="checkbox"/> NO	EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
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Abstract (Limit to 1400 spaces, i.e., approximately fifteen single-space typewritten lines) (16)

On November 5, 1984, with Unit 2 in Mode 6, preparations were being made to lift the reactor vessel (RV) head from the pressure vessel. The refueling pool was filled to approximately one foot below the RV flange. The RV head was in place and all studs were removed. The reactor vessel cavity seal ring was installed and pressure was being maintained at 60 psig in both the horizontal (upper) and vertical (lower) inflatable seals. At approximately 1800, the horizontal inflatable seal failed and completely depressurized. Instrument air and nitrogen backup pressurization supplies to the horizontal seal were subsequently isolated. The reactor vessel cavity seal ring was removed and the failed horizontal seal replaced with a new seal.

On November 6, 1984, the reactor vessel cavity seal ring was returned to service, retested and refueling preparations recommenced on November 7, 1984. The redundant vertical seal in service was not affected by the sequence of events discussed above. Neither the health and safety of plant personnel nor the public were affected by this event.

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LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

FACILITY NAME (1) SAN ONOFRE NUCLEAR GENERATING STATION, UNIT 2	DOCKET NUMBER (2) 0 5 0 0 0 3 6 1	LER NUMBER (6)			PAGE (3)	
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TEXT (If more space is required, use additional NRC Form 366A's) (17)

On November 5, 1984, with Unit 2 in Mode 6, preparations were being made to lift the reactor vessel (RV) head from the pressure vessel. The refueling pool was filled to approximately one foot below the RV flange. The RV head was in place and all studs were removed. The reactor vessel cavity seal ring was installed and pressure was being independently maintained at 60 psig in both the horizontal (upper) (PRESRAY Model No. 580, S/N 50301-1, manufactured 4th quarter 1984) and vertical (lower) (PRESRAY Model No. 583, S/N 19075-1, manufactured 4th quarter 1982) inflatable seals. At approximately 1800 hours, the horizontal inflatable seal failed and completely depressurized. Instrument air and nitrogen backup pressurization supplies to the horizontal seal were subsequently isolated. During this event the pressure to the vertical seal remained constant with its redundant nitrogen backup system intact. The reactor vessel cavity seal ring was removed and inspected prior to removal from the reactor vessel cavity. This inspection confirmed that the failure was limited to the horizontal seal and was located at the east side of its installed position. No problems were noted with the vertical seal. At the completion of this in-place inspection the seal ring was removed and placed on the inspection stand. The horizontal seal rupture occurred in the wall, outside of the seating area, that faces the reactor vessel. Approximately four additional splits in the outer 40 durometer coating were noted at various locations around the seal. These splits, including the failure, were located in the same relative position on the outer seal wall circumference. An inspection of the vertical seal indicated that its surface was in excellent condition.

While on the inspection stand, the horizontal seal was pressurized to 15 psig. The entire seal was again inspected with particular attention paid to the splits in the outer coating noted above. With the exception of the failure location, all other splits did not appear to penetrate the seal fabric coating. No leakage was detected from these other locations.

At the completion of these inspections, the failed upper seal was removed from the seal ring, decontaminated and shipped to PRESRAY Corporation for failure evaluation.

A new horizontal inflatable seal was installed in the seal ring and inspected by SCE in both the deflated and inflated condition. No surface discontinuities or splits were noted. A pressure drop test of the horizontal seal was performed and serviceable condition with no leakage verified. With these inspections and tests completed, the seal ring was re-installed on the reactor vessel. Additional testing in accordance with Maintenance Procedure S023-I-3.30, "Refueling Cavity Seal Installation, Test, and Removal" was performed with the seal ring in place prior to proceeding with refueling preparations.

On November 6, 1984, the reactor vessel cavity seal ring was returned to service, retested and refueling preparations recommenced on November 7, 1984. The vertical seal in service was not affected by the sequence of events discussed above.

No fuel movement activities were permitted until completion of the evaluation of serviceability of both the horizontal and vertical inflatable seals.

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

The results of PRESRAY Corporation's evaluation of the failure, cause, and the effect on the serviceability of both the horizontal and vertical seals currently in service, are:

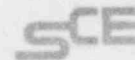
1. Upon inspection of the failed seal, an isolated manufacturer's defect was noted on the inside surface of the extruded inner tube. This defect showed up as an interior wrinkle that extended along the entire length of the seal. The rupture initiated at the interface of the smooth interior surface of the inner tube and the base of this discontinuity. The manufacturer indicated that this type of defect is indicative of an excessive amount of material placed in the mold during the fabrication process. In the case of the smaller diameter seals (Model No. 580) this excess of material can result from a tolerance stacking effect. In addition to the stress riser created by the wrinkling of the inner wall, the excessive material results in a weakening of the outer fabric layer at this location during the curing process.
2. Materials from the same lot used in the construction of the new horizontal seal Serial No. 50301-1 were used in the factory to fabricate a 10 foot section of seal for testing purposes. Destructive test of this sample showed no indication of similar defects.
3. With regard to the vertical seal Serial No. 19075-1 currently in service, the manufacturer's experience has demonstrated that tolerance stacking will not result in the defect noted in the horizontal seal. This is because, for larger cross-section seals, tolerance stacking results in a much smaller percentage increase in material added to the mold.

We have completed our evaluation of the seal failure and have concluded:

1. For this application, both the horizontal and vertical seals will be operated at a nominal pressure of 60 psig.
2. Splits in the outer 40 durometer coating do not affect the pressure retaining capability of the seal(s).
3. The failure of the horizontal seal on November 5, 1984, was caused by an isolated manufacturer's defect not detectable by external examination. There is no indication other seals manufactured by PRESRAY may be defective.
4. The serviceability of the installed vertical seal is not affected.
5. The serviceability of the fuel pool gate seals, which are also PRESRAY Model No. 583, are similarly not affected.

The vertical seal in service was not affected by the sequence of events discussed above. There are no reasonable or credible circumstances under which this event could have been more severe. There was no safety significance to this event and neither the health and safety of plant personnel nor the public were affected by this event.

Southern California Edison Company



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J. G. HAYNES
STATION MANAGER

TELEPHONE
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February 7, 1985

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

Subject: Docket No. 50-361
Informational Report
Licensee Event Report No. 84-070
San Onofre Nuclear Generating Station, Unit 2

This submittal provides an informational Licensee Event Report (LER) for an occurrence involving the Reactor Cavity Seal. Neither the health and safety of plant personnel nor the public were affected by this event.

If you require any additional information, please so advise.

Sincerely,

RWK
RWK Krueger for JG Haynes

Enclosure: LER No. 84-070

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

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