

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) <b>SAN ONOFRE NUCLEAR GENERATING STATION, UNIT 2</b>	DOCKET NUMBER (2) <b>0 5 0 0 0 3 6 1</b>	PAGE (3) <b>1 OF 0 3</b>
---	---	-----------------------------

TITLE (4)  
**POLAR CRANE MALFUNCTION**

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	03	84	84	066	001	11	27	84			0 5 0 0 0																																				
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:15%;">OPERATING MODE (9) <b>6</b></td> <td colspan="11">THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)</td> </tr> <tr> <td rowspan="5">POWER LEVEL (10) <b>0 0 0</b></td> <td><input type="checkbox"/> 20.402(b)</td> <td><input type="checkbox"/> 20.405(c)</td> <td><input type="checkbox"/> 50.73(a)(2)(iv)</td> <td><input type="checkbox"/> 73.71(b)</td> </tr> <tr> <td><input type="checkbox"/> 20.405(a)(1)(i)</td> <td><input type="checkbox"/> 50.36(c)(1)</td> <td><input type="checkbox"/> 50.73(a)(2)(v)</td> <td><input type="checkbox"/> 73.71(c)</td> </tr> <tr> <td><input type="checkbox"/> 20.405(a)(1)(ii)</td> <td><input type="checkbox"/> 50.36(c)(2)</td> <td><input type="checkbox"/> 50.73(a)(2)(vii)</td> <td><input checked="" type="checkbox"/> OTHER (Specify in Abstract below and in Text, NRC Form 366A)</td> </tr> <tr> <td><input type="checkbox"/> 20.405(a)(1)(iii)</td> <td><input type="checkbox"/> 50.73(a)(2)(i)</td> <td><input type="checkbox"/> 50.73(a)(2)(viii)(A)</td> <td rowspan="2"><b>Informational Report</b></td> </tr> <tr> <td><input type="checkbox"/> 20.405(a)(1)(iv)</td> <td><input type="checkbox"/> 50.73(a)(2)(ii)</td> <td><input type="checkbox"/> 50.73(a)(2)(viii)(B)</td> </tr> <tr> <td><input type="checkbox"/> 20.405(a)(1)(v)</td> <td><input type="checkbox"/> 50.73(a)(2)(iii)</td> <td><input type="checkbox"/> 50.73(a)(2)(x)</td> <td></td> </tr> </table>												OPERATING MODE (9) <b>6</b>	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)											POWER LEVEL (10) <b>0 0 0</b>	<input type="checkbox"/> 20.402(b)	<input type="checkbox"/> 20.405(c)	<input type="checkbox"/> 50.73(a)(2)(iv)	<input type="checkbox"/> 73.71(b)	<input type="checkbox"/> 20.405(a)(1)(i)	<input type="checkbox"/> 50.36(c)(1)	<input type="checkbox"/> 50.73(a)(2)(v)	<input type="checkbox"/> 73.71(c)	<input type="checkbox"/> 20.405(a)(1)(ii)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(vii)	<input checked="" type="checkbox"/> OTHER (Specify in Abstract below and in Text, NRC Form 366A)	<input type="checkbox"/> 20.405(a)(1)(iii)	<input type="checkbox"/> 50.73(a)(2)(i)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)	<b>Informational Report</b>	<input type="checkbox"/> 20.405(a)(1)(iv)	<input type="checkbox"/> 50.73(a)(2)(ii)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)	<input type="checkbox"/> 20.405(a)(1)(v)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(x)	
OPERATING MODE (9) <b>6</b>	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)																																														
POWER LEVEL (10) <b>0 0 0</b>	<input type="checkbox"/> 20.402(b)	<input type="checkbox"/> 20.405(c)	<input type="checkbox"/> 50.73(a)(2)(iv)	<input type="checkbox"/> 73.71(b)																																											
	<input type="checkbox"/> 20.405(a)(1)(i)	<input type="checkbox"/> 50.36(c)(1)	<input type="checkbox"/> 50.73(a)(2)(v)	<input type="checkbox"/> 73.71(c)																																											
	<input type="checkbox"/> 20.405(a)(1)(ii)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(vii)	<input checked="" type="checkbox"/> OTHER (Specify in Abstract below and in Text, NRC Form 366A)																																											
	<input type="checkbox"/> 20.405(a)(1)(iii)	<input type="checkbox"/> 50.73(a)(2)(i)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)	<b>Informational Report</b>																																											
	<input type="checkbox"/> 20.405(a)(1)(iv)	<input type="checkbox"/> 50.73(a)(2)(ii)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)																																												
<input type="checkbox"/> 20.405(a)(1)(v)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(x)																																													

LICENSEE CONTACT FOR THIS LER (12)

NAME <b>J. G. HAYNES, STATION MANAGER</b>	TELEPHONE NUMBER
	AREA CODE: <b>7 1 4</b> NUMBER: <b>4 9 2 - 7 7 0 0</b>

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
B	LIR	CIRIN	G080	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

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

On November 3, 1984, at 0648, with Unit 2 in Mode 6 and the reactor vessel head (RVH) lifted approximately 1 inch above the reactor vessel (RV), the polar crane (PC) was de-energized and the load was being held by the mechanical brake. When operations to continue lifting the RVH resumed, the PC operator energized the PC and immediately moved the control to the "hoist up" position. When this was done the RVH rapidly lowered onto the RV.

Minor degradation of the dual (+/-20V DC) power supply card (DPSC) resulted in an uneven voltage application to the control circuitry, causing the output capacitor (OC) of the current limiter feedback card to be charged sufficiently to generate a rapid down drive signal (DS). Control stick movement provided a small up DS and deactivated the hoist motion interlock. The net result was a rapid down DS. The OC requires 2-3 minutes to discharge. Thus, this circuit behavior only occurs when the DPSC is slightly degraded and hoist motion is attempted soon after energization.

The degraded DPSC has been replaced and the PC recertified. Procedures have been revised to require a warm-up period and an operability test prior to use of the PC hoist after energization. The emergency stop function of the control circuit was not affected and there was no safety consequence involved in this event.

8412100560 841127  
PDR ADOCK 05000361  
S PDR

IE22  
|||

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)		
		YEAR	SEQ. NUMBER	REV. NUMBER			
		8 4	- 0 6 6	- 0 0	0 2	OF	0 3

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

On November 3, 1984, with Unit 2 in Mode 6, the refueling sequence of lifting the reactor vessel head (RVH) (EIIS Component Code RPV) was suspended at approximately 0300 awaiting a Temporary Change Notice to the RVH removal procedure to allow the RVH to be lifted greater than 0.005 inches from level. The polar crane (PC) (EIIS Component Code CRN) was de-energized with the RVH suspended approximately 1 inch above the reactor vessel (RV) (EIIS Component Code RPV). The weight of the RVH (approximately 340,000 lbs) was being supported by the PC mechanical brake. When operations to continue lifting the RVH were resumed at 0648, the PC was energized and the PC operator moved the control to the "hoist up" position approximately 15 seconds later. The RVH then rapidly lowered to the seated position on the RV. The operator then pushed the emergency stop button to stop all crane motion. The PC operator then actuated the unloaded auxiliary hook (EIIS Component Code HOI) and it exhibited the same downward travel when subjected to an "up hoist" command.

Subsequent investigation revealed that minor degradation of the dual (+/-20V DC) power supply card (DPSC) (EIIS Component Code RJX) for the hoist drive resulted in an uneven application of voltage to the control circuitry. This in turn caused the output capacitor (EIIS Component Code CP) of the current limiter feedback card to be erroneously charged to a significant value corresponding to a rapid down drive signal. When the control stick was moved off center, it provided a small up drive signal and deactivated the hoist motion interlock. The net result was a rapid down drive signal causing the hoist to lower the RVH onto the RV. It was later found that this capacitor required 2-3 minutes to discharge. Thus, this circuit behavior only occurs when the power supplies are slightly degraded and motion is attempted soon after initial energization. The emergency stop function of the control circuit was not affected and conservatively assuming a two second reaction time, the maximum loaded down hoist travel distance, before the PC operator would activate the emergency stop button, would be 3.36 inches.

The degraded DPSC was replaced and the PC was recertified prior to resuming RVH removal. Procedures have been revised to require a warm-up period and an operability test prior to use of the PC hoist after energization.

SCE will examine the RVH to assess potential damage to the RV and its internals assembly. The examination will consist of the following:

1. Visual inspection of the reactor vessel head lift rig to include torque checks of the capscrews holding the lift rig to the head.
2. Visual inspection of the reactor vessel head keyways, O-ring grooves, and holddown ring contact surface.
3. Visual inspection of the reactor vessel flange.
4. Visual inspection of the reactor vessel internals to include the core support barrel keys, and holddown ring.
5. Inspection of fuel including measurement and TV and periscope examinations.

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)	
		YEAR	SEQ. NUMBER	REV. NUMBER		
		8 4	- 0 6 6	- 0 0	0 3	OF 0 3

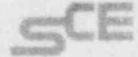
TEXT (If more space is required, use additional NRC Form 366A's) (17)

Additionally, Combustion Engineering will perform calculations and an analytical evaluation of the event on the RV, RVH, RV internals, keyways, and piping supports. Any resultant repairs or corrective actions will be performed and documented.

Similar control circuitry exists on the PC and turbine gantry crane bridge, trolley and hoists, for both Units 2 and 3. Applicable procedures for the operation of these cranes will be revised to require a warm-up period and operability test prior to use.

There are no credible circumstances that could be postulated to have made the consequences of this event more severe because the PC would not have been deenergized with the RVH elevated any higher above the RV. Also, the maximum credible rapid lowering distance that could be postulated would be 3.36 inches as discussed above and analysis has been performed for a drop from 6 inches which results in no significant effects on the RV, RVH and RV internals.

*Southern California Edison Company*



SAN ONOFRE NUCLEAR GENERATING STATION  
P.O. BOX 128  
SAN CLEMENTE, CALIFORNIA 92672

J. G. HAYNES  
STATION MANAGER

TELEPHONE  
(714) 492-7700

November 27, 1984

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

Subject: Docket No. 50-361  
Informational Report  
Licensee Event Report No. 84-066  
San Onofre Nuclear Generating Station, Unit 2

This submittal provides an informational Licensee Event Report (LER) for an occurrence involving a malfunction of the polar crane. 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,

Enclosure LER No. 84-066

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)

IE22  
1/1