

LICENSEE EVENT REPORT (LER)

Facility Name (1) SAN ONOFRE NUCLEAR GENERATING STATION, UNIT 3  
 Docket Number (2) 0 | 5 | 0 | 0 | 0 | 3 | 6 | 2  
 Page (3) 1 of 0 2  
 Title (4)

Loss of Voltage Signal Actuation Due to Inadvertent Relay Trip

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	3	0	4	9	6	9	6	0	3	6	2	1	of	0	2
			---						NONE	0   5   0   0   0					
			0   0   1			0   1			0   5   0   2   9   6			0   5   0   0   0			

OPERATING MODE (9) 1  
 THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10CFR (Check one or more of the following) (11)  
 POWER LEVEL (10) 1 | 0 | 0  
 20.402(b) \_\_\_\_\_ 20.405(c) \_\_\_\_\_ X 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 Abstract below and in text)  
 20.405(a)(1)(iii) \_\_\_\_\_ 50.73(a)(2)(i) \_\_\_\_\_ 50.73(a)(2)(viii)(A) \_\_\_\_\_  
 20.405(a)(1)(iv) \_\_\_\_\_ 50.73(a)(2)(ii) \_\_\_\_\_ 50.73(a)(2)(viii)(B) \_\_\_\_\_  
 20.405(a)(1)(v) \_\_\_\_\_ 50.73(a)(2)(iii) \_\_\_\_\_ 50.73(a)(2)(x) \_\_\_\_\_

LICENSEE CONTACT FOR THIS LER (12)

Name R. W. Krieger, Vice President, Nuclear Generation  
 TELEPHONE NUMBER AREA CODE 7 | 1 | 4 | 3 | 6 | 8 | - | 6 | 2 | 5 | 5

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

CAUSE	SYSTEM	COMPONENT	MANUFAC-TURER	REPORTABLE TO NPRDS	REPORTABLE TO NPRDS	CAUSE	SYSTEM	COMPONENT	MANUFAC-TURER	REPORTABLE TO NPRDS	REPORTABLE TO NPRDS
					/////						/////
					/////						/////
					/////						/////

SUPPLEMENTAL REPORT EXPECTED (14)

Expected Submission Date (15) Month Day Year  
 Yes (If yes, complete EXPECTED SUBMISSION DATE)  NO

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

On 03/04/96 with Unit 3 at 100% power, Electrical Test Technicians (utility maintenance personnel) were preparing to obtain post-maintenance in-service readings on reserve auxiliary transformer 3XR1. At 1333, while obtaining a reading on a differential protective relay, a voltmeter wire inadvertently caught and actuated a contact switch for the relay. This personnel error (cognitive) caused the relay to trip. The protective circuitry operated as designed, tripping open the 220kV breakers supplying all 3 reserve auxiliary transformers and the 4kV breakers supplying both class 1E 4kV buses.

The resulting Loss Of Voltage Signal (LOVS) caused both Unit 3 emergency diesel generators (EDGs) to start. Because power for the Unit 3 class 1E 4kV buses successfully fast transferred to the Unit 2 class 1E 4kV buses, as designed, the EDGs did not load. Because there was a valid Engineered Safety Features Actuation Signal, Edison made a 4 hour non-emergency report at 1515, and submitted this report in accordance with 10CFR50.73(a)(2)(iv). Edison is submitting this supplemental report to provide additional information on the safety significance of this occurrence.

As required by the Technical Specifications, Edison surveilled the A. C. sources for both Units. Edison also verified the integrity of the Unit 3 reserve auxiliary transformers, stopped the running EDGs, reset the 3XR1 protective relay, and, at 1531, completed restoration of the normal Mode 1 electrical configuration. Maintenance supervision reviewed this event with all station Electrical Test Technicians and reemphasized the importance of attention to detail.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

SAN ONOFRE NUCLEAR GENERATION STATION	DOCKET NUMBER	LER NUMBER	PAGE
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On 03/04/96 with Unit 3 at 100% power, Electrical Test Technicians (utility maintenance personnel) were preparing to obtain post-maintenance in-service readings on reserve auxiliary transformer 3XR1 [XFMR]. At 1333, while obtaining a reading on a differential protective relay [87], a voltmeter wire inadvertently caught and actuated a contact switch for the relay. This personnel error (cognitive) caused the relay to trip. The protective circuitry operated as designed, tripping open the 220kV breakers supplying all 3 reserve auxiliary transformers and the 4kV breakers [52] supplying both class 1E 4kV buses [EB].

The resulting Loss Of Voltage Signal (LOVS) [JE] caused both Unit 3 emergency diesel generators (EDGs) to start. Because power for the Unit 3 class 1E 4kV buses successfully fast transferred to the Unit 2 class 1E 4kV buses, as designed, the EDGs did not load. Because there was a valid Engineered Safety Features Actuation Signal [JE], Edison made a 4 hour non-emergency report at 1515, and submitted this report in accordance with 10CFR50.73(a)(2)(iv). Edison is submitting this supplemental report to provide additional information on the safety significance of this occurrence.

As required by the Technical Specifications, Edison surveilled the A. C. sources for both Units. Edison also verified the integrity of the Unit 3 reserve auxiliary transformers, stopped the running EDGs, reset the 3XR1 protective relay, and, at 1531, completed restoration of the normal Mode 1 electrical configuration. Maintenance supervision reviewed this event with all station Electrical Test Technicians and reemphasized the importance of attention to detail.

Because all protective features operated as designed, Edison originally reported that this event had little safety significance. Subsequent to this event, on 3/12/96, the Unit 3 turbine-driven auxiliary feedwater [BA] pump turbine [TRB] tripped during startup for a routine inservice test. Edison re-evaluated the safety significance of the LOVS event in light of potentially reduced pump reliability.

Utilizing probabilistic risk assessment techniques and employing conservative assumptions for pump reliability, Edison estimates the conditional (i.e. instantaneous) core damage frequency due to internal initiating events during the LOVS event on 3/4/96 to have been about  $8.5E-4$ /year. While this level of risk is relatively high, the brief duration of the LOVS event resulted in an increase in the annual core damage probability attributable to internal initiating events of less than  $2E-7$ .

In the followup investigation of the turbine-driven auxiliary feedwater pump trip, the startup trip could not be reproduced despite approximately 20 starts of the turbine over a 60 hour period and another 4 starts spaced geometrically over a 23 day period. Edison completed a formal root cause analysis identifying several potential causes for the turbine trip. Edison concluded after further investigation that some of the potential causes could be dismissed. To bound the remaining potential causes, Edison enhanced the turbine startup sequence by slowing (from 2.5 seconds to 8 seconds) operation of the trip/throttle valve.

Edison submitted LER 3-94-002 to report an inadvertent LOVS actuation caused by a worker jarring a door-mounted protective relay while attempting to repair a door retaining screw.