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August 31, 1992

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

Subject: Docket No. 50-361
30-Day Report
Licensee Event Report No. 92-012
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 an automatic reactor trip. Neither the health nor the safety of plant personnel or the public was affected by this occurrence.

If you require any additional information, please so advise.

Sincerely,

R W Krieger

Enclosure: LER No. 92-012

cc: C. W. Caldwell (USNRC Senior Resident Inspector, Units 1, 2 and 3)

J. B. Martin (Regional Administrator, USNRC Region V)

Institute of Nuclear Power Operations (INPO)

IE22

LICENSEE EVENT REPORT (LER)

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

Title (4)

AUTOMATIC REACTOR TRIP ON LOSS OF TWO REACTOR COOLANT PUMPS DUE TO A SENSED LOSS OF NON-1E 6.9 kV BUS VOLTAGE

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)
										NONE	0 5 0 0 0
0 7	3 1	9 2	9 2	-	0 1 2	- 0	0 8	3 1	9 2		0 5 0 0 0

OPERATING MODE (9)		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10CFR (Check one or more of the following) (11)			
1		20.402(b)	20.405(c)	X 50.73(a)(2)(iv)	73.71(b)
POWER LEVEL (10)	1 0 0	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	TELEPHONE NUMBER
	AREA CODE
R. W. Krieger, Station Manager	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	CAUSE	SYSTEM	COMPONENT	MANUFAC-TURER	REPORTABLE TO NPRDS

SUPPLEMENTAL REPORT EXPECTED (14)

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

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

At 0838 on 7/31/92, with Unit 2 in Mode 1 at approximately 100% power, an automatic reactor trip occurred when a potential transformer (PT) drawer located at the 6.9 kV switchgear 2A02 was opened for thermographic inspections. This resulted in tripping two of four reactor coolant pumps (RCP) on a sensed undervoltage condition. As the RCPs began to slow down, the low RCP speed setpoint was reached, causing the core protection calculators to generate a reactor trip signal on low departure from nucleate boiling ratio (DNBR). Emergency feedwater actuation system (EFAS) signals were generated for both steam generators (SG) due to the expected decrease in SG level following the trip. All reactor protection system and auxiliary feedwater system components actuated as designed. Reactor trip recovery was initiated and Unit 2 was stabilized in Mode 3 at approximately 0903.

The root cause was attributed to inadequate positive controls in the work package and an inadequate warning sign on the switchgear which had failed to prevent an electrician from opening the PT drawer while the PT was energized.

Corrective actions include: 1) the development of additional positive controls to prevent inadvertent PT drawer opening, and 2) the installation of improved signage.

Plant: San Onofre Nuclear Generating Station
Unit: Two
Reactor Vendor: Combustion Engineering
Event Date: 07-31-92
Time: 0838

A. CONDITIONS AT TIME OF THE EVENT:

Mode: 1, Power Operation
RCS Temperature: 553 F

B. BACKGROUND INFORMATION:

Reactor Coolant Pump (RCP) Power Supply:

Two non-Class 1E 6.9 kV auxiliary system buses [EA] (2A01 and 2A02) supply power to the four Unit 2 RCPs [AB, P] (two RCPs on each bus). Bus potential transformers (PT) [XPT] rated at 7,200 to 120 V AC are installed on each 6.9 kV bus to provide accurate voltage and phase angle information. This information is supplied to the PCP undervoltage trip circuit (the RCPs are tripped on an undervoltage condition to prevent equipment damage due to high current, low voltage conditions). These PTs are located at switchgear cabinets 2A01 and 2A02 for the Unit 2 buses in a compartment above each main switchgear cabinet. The PTs are mounted on a movable carriage equipped with primary and secondary disconnecting devices such that opening the PT drawer results in broken circuit continuity, and a bus undervoltage condition to be sensed.

Reactor Protection System (RPS) [JC]:

The core protection calculators (CPCs), which are part of the RPS, calculate departure from nucleate boiling ratio (DNBR) based on calculated reactor power and reactor coolant flow. RCS flow is calculated based on RCP speed. A trip of an RCP would result in the CPCs generating a reactor trip signal on low DNBR.

Auxiliary Feedwater System (AFWS) [BA]:

Following a reactor trip from 100% power, steam generator (SG) [SG] level normally decreases below the emergency feedwater actuation system (EFAS) actuation setpoint, initiating the AFWS. The AFWS is designed to provide all of the feedwater requirements, if necessary due to loss of main feedwater, for decay heat removal following a reactor trip.

Critical Components Program:

A critical component is defined as a component which can initiate a plant transient or activate an engineered safety system. For those components identified as Critical Plant Components, a statement is automatically printed at the beginning of either the maintenance order (MO) work plan or construction work order (CWO) which describes the component as such.

C. DESCRIPTION OF THE EVENT:

1. Event:

At 0838 on 7/31/92, with Unit 2 in Mode 1 at approximately 100% power, an automatic reactor trip occurred when a PT drawer located at the 6.9 kV switchgear 2A02 was opened for thermographic inspections. This resulted in tripping RCPs 2P002 and 2P003 on a sensed undervoltage condition. As the RCPs began to slow down, the low RCP speed setpoint was reached, causing the CPCs to generate a reactor trip signal on low DNBR.

EFAS signals were generated for both SGs due to the expected decrease in SG level following the trip. All RPS and AFWS components actuated as designed. Reactor trip recovery was initiated and Unit 2 was stabilized in Mode 3 at approximately 0903.

2. Inoperable Structures, Systems or Components that Contributed to the Event:

None.

3. Sequence of Events:

TIME	ACTION
0838	Automatic reactor trip occurred.
~0903	Plant conditions were stabilized.

4. Method of Discovery:

Control room alarms and indications alerted the control room operators (utility, licensed) to the RCP trips and subsequent reactor trip.

5. Personnel Actions and Analysis of Actions:

Control room operators responded properly to the reactor trip, implementing normal post-trip procedures to stabilize the plant in Mode 3.

Control room operators also properly verified correct system response to the EFAS signals.

6. Safety System Responses:

The RPS and EFAS (AFWS) components actuated as required by design.

D. CAUSE OF THE EVENT:

1. Immediate Cause:

During the performance of routine thermography on switchgear 2A02, a PT drawer for 6.9 kV switchgear 2A02 was opened by an electrician (utility, non-licensed), resulting in the generation of a RCP undervoltage signal. This drawer encloses a PT which monitors voltage on the bus. As the drawer was opened, moveable contacts de-energized the potential transformer circuit thereby initiating a RCP undervoltage signal, as designed.

When RCPs 2P002 and 2P003 tripped due to a sensed undervoltage condition on the RCP power supply (actual bus voltage was not lost), a reactor trip signal was generated by the CPCs on low DNBR, as designed.

2. Root Cause:

The MO work plan, under which the thermography inspections were performed, covered several components (including switchgear 2AO2) and had the warning: "This MO/CWO requires work on a critical plant component," and the caution: "Equipment is energized, use caution when removing any panels or covers that could come in contact with energized equipment. If in doubt, contact the responsible maintenance supervisor." This work plan was not specific enough to have prevented the PT drawer cabinet of switchgear 2A02 from being opened while energized.

In addition, the PT drawer cabinet had an inadequate warning sign which read: "Warning Trip Hazard." This information is too generic, and the sign was interpreted to mean that something inside the cabinet could cause a plant trip. This warning also appears on several electrical panels and cabinets throughout the plant which do not cause a plant trip on opening.

E. CORRECTIVE ACTIONS:

1. Corrective Actions Taken:

a. As an immediate interim corrective action to prevent recurrence, Operations personnel were provided enhanced guidelines to be followed when issuing work authorizations on critical components (Unit trip hazards).

b. Appropriate signage has been installed to clearly indicate that a reactor trip will occur if the PT drawer is opened while the reactor is critical.

2. Planned Corrective Actions:

a. During the next outage of sufficient duration when the PTs are de-energized, the PT drawer locking mechanisms will be verified functional and then locked in order to prevent inadvertent opening.

b. The appropriate thermography MO work plans will be reviewed and modified as necessary in order to prevent a recurrence of this type event.

c. An ongoing root cause evaluation will be completed by 9/30/92, and any additional recommended corrective actions will be implemented as appropriate.

F. SAFETY SIGNIFICANCE OF THE EVENT:

There is minimal safety significance to this event since all RPS and EFAS (AFWS) components actuated in accordance with design.

G. ADDITIONAL INFORMATION:

1. Component Failure Information:

Not applicable.

2. Previous LERs for Similar Events:

LER 86-015, Docket No. 50-206

On 2/19/86, with Unit 1 in Cold Shutdown, Diesel Generator No. 2 was inadvertently started when an inner compartment door of 4 kV Bus 2C breaker cubicle 152-12C03 was opened, resulting in the generation of a Loss of Bus (LOB) signal. This compartment encloses the potential transformers which monitor the voltage on the normal feeder to Bus 2C. When the door was opened, circuit continuity was broken through move ble contacts, opening the potential transformer circuit and initiating a LOB signal, as designed. Investigation revealed that an engineer and electrician inspecting the as-built configuration of wiring inside 4 kV breaker cubicle 152-12C03, in preparation for implementing a Design Change Package, exceeded the limits of the "Permission" given them by the Control Room operator for the inspection. During the course of this inspection, the electrician violated a "Caution" tag near the handle of the inner compartment door which indicated that opening the door would result in the generation of a LOB signal.

LER 88-010, Docket No. 50-206

On 6/25/88, with Unit 1 in Cold Shutdown, Diesel Generator (DG) No. 2 was again inadvertently started when the inner compartment door of 4 kV Bus 2C breaker cubicle 152-12C03 was opened, resulting in the generation of a LOB signal. The cause of this event was also attributed to a personnel error. A contract electrician, who was in the process of determining if recently installed fuse holders would interfere with the travel of the inner compartment door, opened the door, failing to acknowledge a sign on the door which identified that opening the door would start the DG.

This was similar to the LER 86-015 event. For that event, signage was determined to be adequate and the cause was attributed to a random oversight. Therefore, corrective action was limited to the re-instruction of Unit 1 electricians on the requirements to observe signs. As a result of the LER 88-010 event, in addition to re-instructing Unit 1 contract electricians, locking devices were installed on the inner compartment doors for breaker cubicles 152-12C03 and 152-11C03, thereby restricting operation of the doors. Since these actions were limited to installation of locking devices on inner compartment doors at Unit 1, it could not have prevented the Unit 2 event being reported herein (LER 92-012, Docket No. 50-361), which is concerned with opening an outer compartment door.