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May 27, 2009

U.S. Nuclear Regulatory Commission
Document Control Desk
Washington, D.C. 20555-0001

Subject: **Docket No. 50-361**
Licensee Event Report No. 2007-006-001
San Onofre Nuclear Generating Station, Unit 2

Dear Sir or Madam:

This submittal provides a Licensee Event Report (LER) 2007-006-001 to revise the report of the inoperability of an emergency chiller due to a loose electrical connection, dated February 5, 2009. Neither the health nor the safety of plant personnel or the public was affected by this occurrence.

If you require any additional information, please contact me.

Sincerely,

Albert R. Hochevar
Station Manager

Unit 2 LER No. 2007-006-001

cc: E. E. Collins, NRC Regional Administrator, Region IV
G. G. Warnick, NRC Senior Resident Inspector, San Onofre Units 2 & 3

P. O. Box 128
San Clemente, CA 92674-0128

NRC FORM 366 (9-2007)	U.S. NUCLEAR REGULATORY COMMISSION	APPROVED BY OMB: NO. 3150-0104	EXPIRES: 08/31/2010
LICENSEE EVENT REPORT (LER) (See reverse for required number of digits/characters for each block)		Estimated burden per response to comply with this mandatory information collection request: 50 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Records Management Branch (T-6 E6), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to bjs@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202 (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.	

1. FACILITY NAME	2. DOCKET NUMBER	3. PAGE
San Onofre Nuclear Generating Station Unit 2	05000-361	1 OF 4

4. TITLE
Loose electrical connection results in one train of Emergency Chilled Water (ECW) system inoperable

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MO	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO	MO	DAY	YEAR	FACILITY NAME: San Onofre Unit 3	DOCKET NUMBER: 05000-362
06	09	2007	2007	006	01	5	27	2009	FACILITY NAME:	DOCKET NUMBER:

9. OPERATING MODE	1
10. POWER LEVEL	99

11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply)

	20.2201(b)		20.2203(a)(3)(ii)		50.73(a)(2)(ii)(B)		50.73(a)(2)(ix)(A)
	20.2201(d)		20.2203(a)(4)		50.73(a)(2)(iii)		50.73(a)(2)(x)
	20.2203(a)(1)		50.36(c)(1)(i)(A)		50.73(a)(2)(iv)(A)		73.71(a)(4)
	20.2203(a)(2)(i)		50.36(c)(1)(ii)(A)		50.73(a)(2)(v)(A)		73.71(a)(5)
	20.2203(a)(2)(ii)		50.36(c)(2)		50.73(a)(2)(v)(B)		OTHER Specify in Abstract below or in NRC Form 366A
	20.2203(a)(2)(iii)		50.46(a)(3)(ii)		50.73(a)(2)(v)(C)		
	20.2203(a)(2)(iv)		50.73(a)(2)(i)(A)	X	50.73(a)(2)(v)(D)		
	20.2203(a)(2)(v)	X	50.73(a)(2)(i)(B)		50.73(a)(2)(vii)		
	20.2203(a)(2)(vi)		50.73(a)(2)(i)(C)		50.73(a)(2)(viii)(A)		
	20.2203(a)(3)(i)		50.73(a)(2)(ii)(A)		50.73(a)(2)(viii)(B)		

12. LICENSEE CONTACT FOR THIS LER

NAME	TELEPHONE NUMBER (Include Area Code)
Albert R. Hochevar, Station Manager	949-368-9275

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

CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX
				N					

14. SUPPLEMENTAL REPORT EXPECTED				15. EXPECTED SUBMISSION DATE	MONTH	DAY	YEAR
	YES (If yes, complete EXPECTED SUBMISSION DATE)	X	NO				

16. ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)

On 6/9/07 with Units 2 and 3 at about 99 percent power, SCE personnel found the control panel for the Train A Emergency Chiller, E336, de-energized. In a separate power panel, SCE found a cable pulled out of the breaker supplying the 120VAC. The chiller provides a safety function to both Units.

SCE determined the retaining screw anchoring the cable to the supply breaker in the power panel was stripped, preventing securing the cable tightly. The loose connection was most likely due to over tightening the screw on 6/28/05 when the breaker was replaced. From 6/28/05 to 6/9/07, the Emergency Chiller panel was observed to be energized each shift. However, SCE has concluded that it may not have performed its safety function in a seismic event, rendering it inoperable. Technical Specification (TS) 3.7.10, ECW System [KM], requires restoring an inoperable train within 14 days, else initiate shutdown. Failure to enter this Action violated the TS.

SCE replaced the breaker and returned the chiller to Operable. There was very little risk significance to the condition.

Plant:	San Onofre Nuclear Generating Station (SONGS) Unit 2
Event Date:	June 9, 2007
Reactor Vendor:	Combustion Engineering
Mode:	Mode 1- Power
Power:	99 percent

Background:

At SONGS, the Emergency Chilled Water (ECW) [KM] System is common to both Units 2 and 3. It provides a heat sink for the removal of process and operating heat from selected safety related air handling systems during a Design Basis Accident (DBA). The ECW system is a closed loop system consisting of two 100 percent capacity independent trains - each loop shared by Units 2 and 3. (SONGS Units 2 and 3 share a common Auxiliary Building that houses the control room requiring temperature control during a design basis accident.) Each loop (train) of the ECW has an Emergency Chiller (ME336 and ME335) which removes heat from the chilled water and transfers the heat to the Component Cooling Water [CC] System.

Technical Specifications (TS) 3.7.10 requires two ECW trains to be operable during Modes 1-4. If one train is inoperable, TS 3.7.10, Action A requires SCE to restore the train to operable status within 14 days. Should the Completion Time not be met, TS 3.7.10, Action B requires SCE to initiate shutdown. This applies to both Units 2 and 3.

Description of the Event:

On June 9, 2007, at approximately 0745 PDT, during routine Operator Shift rounds, SCE personnel found the control panel to Emergency Chiller, Train A, (ME336) de-energized. The chiller was declared inoperable and Technical Specification (TS) 3.7.10 Action A (one train of ECW inoperable) was entered for both Units 2 and 3. During the subsequent repair efforts, in a separate power panel (Q033), an HVAC technician found a power cable pulled out of the feeder breaker supplying 120VAC to the chiller control panel, L177. On June 9, 2007 at approximately 1700 PDT, Emergency Chiller, ME336, was declared Operable after the breaker was replaced and successful post maintenance testing of the Chiller.

The repair was completed within the allowed outage time of 14 days. SCE initially concluded the equipment to have failed at the time the operator observed the de-energized control panel. Therefore, a LER was not sent.

On December 9, 2008, (discovery date) the NRC Resident Inspector questioned the SCE evaluations of the affect of the loss of power to this panel. After re-examining the condition of the breaker connection and its function in the control circuit, SCE concluded that it may not have provided power to the Chiller to perform its safety function in a seismic event during a period from breaker installation, June 28, 2005, to repair, June 9, 2007. Therefore, SCE is reporting this in accordance with 10CFR50.73(a)(2)(i)(B) for a condition prohibited by TS.

From February 5, 2007 to February 10, 2007, Train B of the ECW system was out of service for planned maintenance. Therefore, the redundant equipment in the same system was not available to perform the required safety function. SCE is reporting this in accordance with 10CFR50.73(a)(2)(v)(D) for the loss of safety function.

Cause of the Event:

The loose connection most likely resulted from damage to the threads on the breaker retaining screw caused when the breaker was replaced on June 28, 2005. An examination of the connector threads revealed the retaining screw anchoring the cable to the supply breaker was stripped, preventing securing the cable tightly.

Corrective Actions:

SCE has completed the following corrective actions:

The breaker was replaced on June 9, 2007.

On July 25, 2007, SCE conducted a meeting with Nuclear Construction Engineers, Supervisors, technicians and craft to discuss the results of the cause evaluation associated with this event. The scope of the meeting was to raise awareness of potential for stripping screws during a tightening operation, and to assure a quality connection by conducting a pull test at task completion.

Since the original Licensee Event Report, SCE has completed an additional cause evaluation of this event and implemented additional corrective actions. The additional corrective actions are:

1) The Maintenance Order Planning and Processing procedure has been revised. The procedure requires Work packages that disturb an electrical connection to have critical steps to restore the connection to design conditions.
2) The revised Maintenance Order Planning and Processing procedure requires that Work packages that disturb an electrical connection shall have Post Maintenance Testing or Post Maintenance Verification specified.
3) SCE will perform a training needs analysis for the electrical disciplines to identify and, as appropriate, implement changes to the SONGS training program.

Safety Significance:

From June 28, 2005 to June 9, 2007, the Emergency Chiller panel was routinely observed to be energized each shift. Therefore, the Chiller was available to fulfill its safety function to all but seismic events. Except for the period February 5, 2007 to February 10, 2007, the opposite train of the ECW System was operable and capable of performing its safety function for emergency chilled water between June 28, 2005 and June 9, 2007. Based on these ECW train availabilities, SCE completed an assessment of the incremental core damage probability (ICDP) and the incremental large early release probability (ILERP) for the non-seismically qualified connection. This assessment concluded the ICDP and ILERP were 5E-7 and 4E-8, respectively. Therefore, the condition had very little risk significance.

In addition, SCE is currently revising the plant model in regards to loss of room coolers.

Additional Information:

SCE initially identified this event when it occurred in June 2007 but incorrectly concluded the event was "failed when found" and that a report to the NRC was not required. SCE questioned the correctness of that reportability evaluation during an August 2008 audit of previous occurrences of loose electrical connections. That audit and re-assessment for reportability were part of corrective actions resulting from previous events (LER 2-2008-006, LER 3-2005-01 and LER 2-2007-005). An associated August 2008 reassessment of Chiller Operability in the as-found condition incorrectly concluded that the de-energized circuit did not affect its Operability. This resulted in a second missed opportunity to report this occurrence. SCE is completing an evaluation of the factors that lead to the missed opportunities to report this occurrence. SCE will implement appropriate corrective actions.

During a more extensive review of ECW system reportability evaluations, SCE determined a normal room cooler, credited as a substitute for a required room cooler in July 2005, did not meet the required design air flow specifications. Corrective Action to clean the coolers had been previously implemented. Technical Specification Bases 3.7.10 Table 1, "Individual Room Coolers," allows substitution of the normal room coolers and fans for the safety related 1E powered coolers and fans. On 7/24/05, the Normal Room Cooler, 3ME413, was credited for a period of approximately 99 hours as a backup to Safety Related Cooler, 3ME416, for the ECCS Train B pump room. The potential low flow condition of cooler 3ME413 would not support Train B ECCS pump operation under all anticipated design conditions, therefore exceeding the 72 hour AOT for the ECCS operability.