

10 CFR 50.73(a)(2)(ii)(B)

May 14, 2012

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

Subject: **Dockets No. 50-361, 50-362**
LER 2012-002-00, Emergency Diesel Generator Vibration Trip Not Bypassed
for Non-Accident Conditions
San Onofre Nuclear Generating Station (SONGS), Units 2 and 3

Dear Sir or Madam:

Attached is Licensee Event Report (LER) 2012-002-00, which is being submitted in accordance with 10 CFR 50.73(a)(2)(ii)(B).

This letter does not contain any commitments. If you have any questions regarding the attached report, please call Lee Kelly at 949-368-6657.

Sincerely,



Attachment: LER 2012-002-00

cc: E.E. Collins, Regional Administrator, NRC Region IV
R. Hall, NRC Project Manager, SONGS Units 2 and 3
G.G. Warnick, NRC Senior Resident Inspector, SONGS Units 2 and 3

LICENSEE EVENT REPORT (LER)

Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the FOIA/Privacy Section (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to infocollects.resource@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 an 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.

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4. TITLE
Emergency Diesel Generator Vibration Trip Not Bypassed For Non-Accident Condition

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO.	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
03	17	2012	2012-002-00			05	14	2012	SONGS Unit 3	05000362
									FACILITY NAME	DOCKET NUMBER
									N/A	N/A

9. OPERATING MODE 5	11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR§: <i>(Check all that apply)</i>									
10. POWER LEVEL 0%	<input type="checkbox"/> 20.2201(b)	<input type="checkbox"/> 20.2203(a)(3)(i)	<input type="checkbox"/> 50.73(a)(2)(i)(C)	<input type="checkbox"/> 50.73(a)(2)(vii)						
	<input type="checkbox"/> 20.2201(d)	<input type="checkbox"/> 20.2203(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)						
	<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 20.2203(a)(4)	<input checked="" type="checkbox"/> 50.73(a)(2)(ii)(B)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)						
	<input type="checkbox"/> 20.2203(a)(2)(i)	<input type="checkbox"/> 50.36(c)(1)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(ix)(A)						
	<input type="checkbox"/> 20.2203(a)(2)(ii)	<input type="checkbox"/> 50.36(c)(1)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(iv)(A)	<input type="checkbox"/> 50.73(a)(2)(x)						
	<input type="checkbox"/> 20.2203(a)(2)(iii)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(v)(A)	<input type="checkbox"/> 73.71(a)(4)						
	<input type="checkbox"/> 20.2203(a)(2)(iv)	<input type="checkbox"/> 50.46(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(v)(B)	<input type="checkbox"/> 73.71(a)(5)						
<input type="checkbox"/> 20.2203(a)(2)(v)	<input type="checkbox"/> 50.73(a)(2)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(C)	<input type="checkbox"/> OTHER							
<input type="checkbox"/> 20.2203(a)(2)(vi)	<input type="checkbox"/> 50.73(a)(2)(i)(B)	<input type="checkbox"/> 50.73(a)(2)(v)(D)	Specify in Abstract below or in NRC Form 366A							

12. LICENSEE CONTACT FOR THIS LER

NAME Douglas R. Bauder, Site Vice President and Station Manager	TELEPHONE NUMBER (Include Area Code) 949-368-9275
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13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX
		N/A					N/A		

14. SUPPLEMENTAL REPORT EXPECTED <input type="checkbox"/> YES (If yes, complete 15. EXPECTED SUBMISSION DATE) <input checked="" type="checkbox"/> NO	15. EXPECTED SUBMISSION DATE	MONTH	DAY	YEAR

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

On 3/16/12 with both SONGS units in Mode 5, engineers reviewing the replacement of a vibration sensor on one of the Emergency Diesel Generators (EDG) questioned if the originally designed high vibration trip, which is bypassed under accident conditions, could spuriously actuate during a loss of offsite power coincident with a seismic event. The vibration sensor was provided as original equipment installed with the EDGs in 1981 and was designed to respond to high frequency bearing vibration, not low frequency seismic activity. Technical Specifications (TS) and the Updated Final Safety Analysis Report (UFSAR) require automatic start of the EDGs. On 3/17/12 an engineering review found the vibration sensor design documentation did not address spurious actuation. This event is being reported as an unanalyzed condition in accordance with 10 CFR 50.73(a)(2)(ii)(B), as the UFSAR does not clearly identify that the high vibration trip could affect automatic operation. A formal analysis is in progress evaluating the sensor response to seismic events. Immediate corrective actions completed March 17, 2012 disabled the high vibration trips. EDG operation for accident mitigation was not affected. Approximately four hours are assumed to be available for the operators to restart an EDG, assuming a station blackout has occurred.

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Background

San Onofre Units 2 and 3 each have two redundant trains of Emergency Diesel Generators (EDG) [EK] to provide onsite AC power when the offsite AC power is unavailable. Each EDG powers the associated 4KV Class 1E busses [BU], supplying the Engineered Safety Features (ESF) [B] for accident mitigation, and the electrical loads necessary to achieve and maintain safe shutdown. Normally, the offsite AC power from the switchyard is distributed to the safety related 4KV Class 1E busses. If the offsite power is interrupted, the resulting voltage drop actuates the Loss of Voltage Signal (LOVS), automatically starting the EDGs. The LOVS also starts the EDGs in response to a degraded voltage condition to ensure sufficient power is available support an ESF actuation.

The EDGs start automatically in response to an ESF actuation, generated by the Safety Injection Actuation Signal (SIAS). Under a SIAS actuation, with a loss of power to the 4KV ESF busses, the associated 4KV ESF busses are unloaded, and the ESF components are automatically reloaded in sequence after the EDG has achieved rated speed and voltage. In response to a loss of offsite power to the 4KV ESF buses without a SIAS, the LOVS automatically starts the EDGs, and the supported components are manually realigned to the bus.

The four General Motors Electromotive Division EDGs were procured from Stewart & Stevenson Services in 1977 and installed in the plant in 1981. A vibration sensor was included with the engine accessories, connected to a vibration monitor [MON] in the local panel. The vibration monitor was one of several protective devices in the non-critical engine trip circuit, and was powered by the EDG above idle speed to protect the generator bearings. A trip of the EDG causes the monitor to lose power and automatically resets the high vibration trip, allowing a manual restart of the EDG from either the control room or the EDG local panel.

The high vibration trip and the other non-critical trips are bypassed by a SIAS to prevent spurious loss of on-site generation when power is immediately needed for accident mitigation. The non-critical trips are active for equipment protection under other conditions that are not as time critical. The non-critical trips are not bypassed by a LOVS, unless a SIAS is also present.

Description of Event

The vibration sensor on Unit 2 EDG 2G003 failed during a routine surveillance test on May 12, 2011. Spare parts were unavailable, as the vibration sensor, Metrix Model 5485C, is no longer manufactured. Subsequently a design modification was implemented on May 16, 2011 to temporarily disable the trip on EDG 2G003 while a replacement was located.

On 3/16/12 an engineer reviewing the seismic qualifications needed to procure a replacement vibration sensor questioned whether the high vibration trip could interrupt the onsite electrical generation during a non-accident loss of offsite power with a seismic event. Subsequently, on 3/17/12 with both SONGS units in Mode 5 (Cold Shutdown), the initial engineering review concluded there was insufficient design basis documentation to ensure the high vibration sensor would not spuriously actuate the high vibration trip for the non-accident conditions. Although the high vibration trip is bypassed by a SIAS, the EDGs are designed to automatically

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start on a LOVS and the high vibration trip should only be actuated for equipment protection. An analysis of the vibration trip circuit is currently being completed.

TS 3.8.1 "AC Sources-Operating" requires two EDGs operable in Modes 1-4; TS 3.8.2 "AC Sources--Shutdown," requires a single EDG operable in Modes 5 and 6, during movement of fuel assemblies. TS 3.3.7 "Diesel Generator (DG) - Undervoltage Start," requires the LOVS to be operable in Modes 1-4, and whenever the associated EDG is required to be operable by TS 3.8.2. The TS Bases for Limiting Condition of Operation (LCO) 3.3.7 requires the LOVS to be "operable to ensure the automatic start of the DG is available when needed." Updated Safety Analysis Report (USFAR) Section 8.3 "Onsite Power Systems," specifically states the EDGs automatically start on a loss of power to the Class 1E 4KV busses. The UFSAR accident analysis does not credit the initial operation of the EDGs for the Loss of Normal AC Power event, however, the Technical Specifications and UFSAR assume the EDGs operate automatically when needed. The potential spurious actuation of the high vibration trip by the vibration sensor was not analyzed for non-accident seismic conditions.

At the time of discovery on March 17, 2012, both units were in Mode 5 and TS 3.8.2 was in effect, requiring a single EDG operable at each unit. Prior to discovery the high vibration trip was disabled on EDG 3G002, and the trip had been previously disabled on EDG 2G003 in May 2011, thus complying with TS 3.8.2.

The potential for spurious actuation of the high vibration trip during a loss of offsite power event without a SIAS was not analyzed in the licensing basis and is reported as an unanalyzed condition in accordance with 10 CFR 50.73(a)(2)(ii)(B), "Any event or condition that resulted in the nuclear power plant being in an unanalyzed condition that significantly degraded plant safety."

Cause of the Event

Under current and past regulatory requirements, the automatic start of the EDG in response to non-accident events does not require bypassing the non-critical trips. Subsequent to the installation of the EDGs in 1981, it was assumed that the vendor design and qualification of the EDGs would have included verification that the high vibration trip was not subject to spurious actuation. The 1977 original vendor seismic qualification test report showed the vibration monitor and relays were seismically qualified, but the operation of the high vibration trip was not addressed.

The SONGS Final Safety Analysis Report (FSAR), Amendment 5 (1977), did not identify the high vibration trip could spuriously actuate under non-accident conditions when the EDGs may be needed. Subsequently, the UFSAR included the high vibration trip on the list of non-critical trips. The requirements for the LOVS automatic start were incorporated into TS 3.3.7 in 1992, based on ensuring the EDGs started in response to a degraded voltage condition.

Corrective Actions

Immediate action was taken on March 17, 2012 to disable the high vibration trip circuit on the EDGs.

Long Term Corrective Actions are proceeding to confirm the response of the high vibration trip under seismic conditions, and to review the operation of the other non-critical trips.

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Safety Significance

There was no safety significance for a Design Basis Accident (DBA) requiring ESF actuation, as a SIAS bypasses the non-critical EDG trips, including the high vibration trip. UFSAR Section 15.2.1.4, "Loss of Normal AC Power," does not credit operation of standby power (EDGs) for the first thirty minutes of the event. For the non-accident loss of offsite power due to a seismic event, the EDGs are designed to automatically start, and could have been subject to a spurious high vibration trip.

Each EDG has a high vibration trip alarm on the control room panel. Although unlikely, should an EDG trip, the procedures direct the operators to check for the cause of the alarm and, with shift manager approval, attempt a restart. Approximately four hours are assumed to be available for the operators to restart an EDG, assuming a station blackout has occurred.

Operating Experience

In 2007, following maintenance, EDG 2G002 tripped on the non-critical High Stator Temperature trip caused by a failed circuit module. The high stator temperature trip was subsequently removed, as it was evaluated as not necessary for equipment protection. The remaining non-critical trips were retained at that time for equipment protection.