

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

September 3, 2010

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

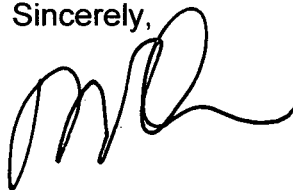
Subject: **Docket No. 50-361**
Licensee Event Report No. 2009-005
San Onofre Nuclear Generating Station, Unit 2

Dear Sir or Madam:

This submittal provides Licensee Event Report (LER) 2-2009-005 to report a wiring error in a Diesel Generator fire isolation fuse. Neither the health nor safety of plant personnel or the public was affected by this occurrence.

If you require any additional information, please contact me.

Sincerely,



Enclosure: Unit 2 LER No. 2009-005

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

LICENSEE EVENT REPORT (LER)

(See reverse for required number of digits/characters for each block)

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

4. TITLE
Wiring Error in Diesel Generator Circuit Results in Loss of Fire Isolation Capability

| 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 | DOCKET NUMBER |
| 02 | 03 | 2009 | 2009-005-00 | | | 09 | 03 | 2010 | | |

| | | | | | | | | | | |
|--------------------------|---|---|--------------------|---|----------------------|---|--|--|--|--|
| 9. OPERATING MODE | 5 | 11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR (Check all that apply) | | | | | | | | |
| 10. POWER LEVEL | 0 | 20.2201(b) | 20.2203(a)(3)(ii) | X | 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) | | 50.73(a)(2)(v)(D) | | | | | |
| | | 20.2203(a)(2)(v) | 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 Douglas R. Bauder, Site VP and Station Manager | TELEPHONE NUMBER (Include Area Code) 949-368-9275 |
|---|---|

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 | | | | | |

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

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

On 2/3/2009, with Unit 2 in Mode 5, plant personnel were performing planned maintenance on the Unit 2 Train A Emergency Diesel Generator (EDG) control panel. During this testing, it was discovered that a fire isolation fuse was mis-wired and bypassed the fuse protection for the local EDG control circuitry. In this condition, a hot-short on the remote (control room) wiring would open circuit the control power fuse to the EDG excitation circuitry and cause a loss of EDG function. SCE is reporting this occurrence in accordance with 10CFR50.73(a)(2)(ii)(B).

On 2/3/2009, SCE corrected the wiring error to match to restore Unit 2 to the credited Appendix R configuration. SCE initiated hourly fire-watches at designated cable locations in Unit 3 until July 2009 when the Unit 3 Train A EDG excitation circuit was confirmed to be wired properly. Train B EDGs for Units 2 and 3 are not credited in the Appendix R analysis. They do not have fire isolation fuses in the circuit design and are not susceptible to this failure mode.

SCE has determined that the EDG Train A wiring error has a very low safety significance.

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Plant: San Onofre Nuclear Generating Station (SONGS) Unit 2
 Event Date: February 3, 2009
 Reactor Vendor: Combustion Engineering
 Mode: Mode 5- Cold Shutdown
 Power: 0 percent

Background:

San Onofre Unit 2 has two Emergency Diesel Generators (EDGs) [EK] to provide emergency AC power if normal AC power is unavailable. The EDGs act as an independent and redundant source of power to the Engineered Safety Feature systems necessary for safe shutdown. Under normal operating conditions, the EDGs are controlled remotely from the control room. To comply with 10CFR50, Appendix R Section III.G.3 and III.L, SCE designated one train (Protected Train A) of AC sources to be free from fire damage. Additionally, to protect the Train "A" local EDG control circuitry from fire-induced hot-shorts, SCE provided fuses between the EDG control circuitry in the control room and the local control circuitry. In the event of an Appendix R control room / Alternate safe shutdown fire and a fire induced hot short, the fire isolation fuse(s) would open, leaving the EDG circuitry intact to allow operators to start the EDG locally.

Description of Event:

On February 3, 2009 (Date of Discovery), with Unit 2 in Mode 5 (Cold Shutdown), plant personnel were performing planned maintenance on the Emergency Diesel Generator (EDG) control panel. During this testing, it was discovered that circuitry associated with a fire isolation fuse was mis-wired which bypassed the fire isolation fuse protection for the local EDG control circuitry.

On March 12, 2009, SCE determined that with this condition present, a hot-short on the remote (control room) wiring would open circuit the control power fuse to the EDG excitation circuitry and cause a loss of EDG function. The wiring error could have impacted plant safety in the event of an Appendix R fire in certain plant areas including the control room or cable spreading room. Therefore, consistent with the guidance provided NUREG-1022, Rev. 2, SCE is reporting this occurrence in accordance with 10CFR50.73(a)(2)(ii)(B), a condition that resulted in the nuclear power plant being in an unanalyzed condition that significantly degraded plant safety.

While the incorrect wiring impacted the Appendix R qualifications of the Train "A" EDG, it did not impact other design functions and the EDG was capable to fulfill its safety function for all Design Basis Accidents.

Cause of the Event:

The wiring error described above was introduced during the installation of an upgraded electronic governor and Digital Reference Units (DRU) for the Unit 2 Train A EDG in September 2004. The EDG was run for post-maintenance testing and both AVRs unexpectedly failed to control EDG voltage. Testing was stopped and it was determined that two wire connections on the K-49 Manual Regulator Relay were installed incorrectly. The wiring was corrected and the post maintenance testing completed satisfactorily. Another latent wiring error (the subject of this LER) was not detected at that time.

An Apparent Cause Evaluation (ACE) completed in 2004 determined wiring errors were caused by a Test Technician incorrectly labeling some of the wires involved in the design change due to inadequate procedure/rule use by the test technician. The mislabeled wires were then terminated to the wrong

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locations. The supervisor involved also did not conduct a pre-job brief with sufficient detail to detect that the technician's planned scope of circuit testing was inadequate.

A second ACE, completed in April, 2009, reexamined the 2004 occurrence. The latent fuse wiring errors were also a result of the mislabeling discussed above. The error went undetected in 2004, however, because the ECP work order plan for the circuit checks was not adequate to ensure that all the wiring in the excitation circuit was properly identified and terminated in the proper location.

Corrective Actions:

On February 3, 2009, SCE corrected the wiring error on the control room circuit to Train A EDG to match SONGS drawings and to restore Unit 2 to the credited Appendix R configuration.

Pending inspection of the same fuse installed in the Unit 3 Train A EDG, SCE initiated hourly fire-watches at designated cable locations in Unit 3.

During maintenance in July 2009, SCE verified the Unit 3 Train A EDG excitation circuit was wired properly. Train B EDGs for Units 2 and 3 are not credited in the Appendix R analysis for a control room or cable spreading room fire. They do not have fire isolation fuses in the circuit design and are not susceptible to this failure mode.

The corrective actions detailed in SCE's response to Notice of Violation EA-08-296 dated January 19, 2009 (loose electrical connections associated with a battery output breaker), apply equally to this event. As noted in that response, SCE revised appropriate maintenance procedures to provide additional assurance that critical electrical connections, as defined by procedure, disturbed during maintenance activities are restored to their design condition.

Safety Significance:

SCE has determined that the EDG Train A wiring error has a very low safety significance. The Incremental Conditional Core Damage Probability (ICDP) and Incremental Conditional Large Early Release Probability (ILERP) reflecting the EDG Train A mis-wiring were calculated to be 7.8E-7 and 5.6E-8, respectively. These estimates include contributions from the control room fires affecting the control panel as well as non-control room (e.g., cable spreading room) fires affecting the EDG Train A wiring. The very low safety significance of the wiring error can be mainly attributed to the availability of other EDGs, low fire ignition frequencies, and the unique features of the areas that could be affected by this wiring error. The control room is manned at all times and the cable spreading room is equipped with early warning ionization fire detectors and a thermally activated automatic deluge fire water system.

Additional Information:

In the last three years there have been no similar major occurrences of loss of fire protection due to plant configuration errors.

This LER should have been submitted to the NRC before April 6, 2009. SCE is evaluating, through its corrective action program, the failure to submit a timely LER.