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 MORGAN,H.E. Southern California Edison Co.
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SUBJECT: LER 89-012-00:on 890808,delinquent firewatch posting for
 inoperable fire detection equipment.

W/9 ltr.

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Southern California Edison Company

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H. E. MORGAN
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May 3, 1990

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

Subject: Docket No. 50-362
30-Day Report
Licensee Event Report No. 89-012
San Onofre Nuclear Generating Station, Unit 3

Pursuant to 10 CFR 50.73(d), this submittal provides the required 30-day written Licensee Event Report (LER) for an occurrence involving a delinquent fire watch posting for inoperable fire detectors at Unit 3. Neither the health and safety of plant personnel nor the public was affected by this occurrence.

If you require any additional information, please so advise.

Sincerely,

H. E. MORGAN
STATION MANAGER

CACouser
Enclosure: LER No. 89-012

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)

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LICENSEE EVENT REPORT (LER)														
Facility Name (1) SAN ONOFRE NUCLEAR GENERATING STATION, UNIT 3										Docket Number (2) 015010031612			Page (3) 1 of 1	
Title (4) DELINQUENT FIREWATCH POSTING FOR INOPERABLE FIRE DETECTION EQUIPMENT														
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	8	08	8	9	0	1	2	0	5	0	NONE			015010031612
OPERATING MODE (9)			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)			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 H. E. Morgan, Station Manager										TELEPHONE NUMBER 7114 3168 - 6241				
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	
<input type="checkbox"/> Yes (If yes, complete EXPECTED SUBMISSION DATE) <input checked="" type="checkbox"/> NO														
ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single-space typewritten lines) (16)														

On April 3, 1990, with Unit 3 operating at 100% power, Emergency Preparedness personnel reviewing a Nonconformance Report recognized that a supervisory circuit for fire detection in an electrical tunnel was inoperable and that appropriate compensatory measures had not been implemented as required by Technical Specification (TS) 3.3.3.7 (an hourly firewatch posted within one hour). Subsequent investigation determined that the supervisory system had failed a TS surveillance test on August 7, 1989, and had been inoperable since that time. In addition, a manual hand pull release for a deluge valve associated with another fire detection system had also failed during performance of the same TS surveillance. A review of compensatory measures taken between August 8, 1989 and April 3, 1990 determined that hourly firewatches had not been posted as required to satisfy the requirements of TS 3.3.3.7.

The missed firewatches were the result of a failure to declare the fire detectors inoperable following a TS surveillance. As a result, firewatches posted for the performance of testing were removed prematurely upon the completion of the testing. The supervisory relay failure was due to a current leakage path to ground and the failure at the manual pull station was caused by an overly compressed weight spring. As corrective action a firewatch was posted on April 3, 1990. The process to ensure notifications of failed fire protection components result in posted firewatches will be enhanced and this event will be reviewed with Operations and Maintenance personnel addressing the importance of specific communications concerning the operability of equipment.

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Plant: San Onofre Nuclear Generating Station
Unit: Three
Reactor Vendor: Combustion Engineering
Discovery Date: 04/03/90

A. CONDITIONS AT TIME OF THE EVENT:

Unit 3: Mode 1, Power Operations at 100% Reactor Power
RCS Temperature at 553 F

B. BACKGROUND INFORMATION:

1. System Information

The Units 2 and 3 actuation fire detection system [IC] consists of a series of fire detectors [DET], which provide input to an associated Pyrotronics control panel [PL]. This control panel then sends data to a Honeywell data gathering panel. From this panel, signals are sent to the Fire Monitoring System (FMS) where information on power, fire, and/or trouble indication associated with the fire detection loops is processed. From the FMS, appropriate alarm signals are transmitted to the Control Room and the office of the Emergency Services Officer (ESO) for response.

The fire detection instrumentation consists of heat detectors [DET, IA], which detects the presence of fire in the vicinity of the detector. The fire and smoke detection systems include a supervisory circuit that indicates the failure of individual circuits and detectors. The supervisory systems are tested at the individual control panels by lifting one of the four leads that connect the control panel to the field detector loop. In this manner, current flow through the supervisory loop is interrupted and the supervisory relay, which is normally energized, drops out. The failure of the supervisory relay to drop out during testing is due to long detector loop cable (with its inherent capacitive leakage to ground) which provides a path to ground to keep the relay energized when the number four wire is lifted.

A fire area is that portion of a building or plant that is separated from other areas by fire rated walls, floors, ceilings, or bounded by barriers evaluated to prevent propagation of fire. A fire zone is a portion of a fire area that is best analyzed specifically as a zone within a fire area. Fire zone/area 3-SE-30-142A, a safety equipment building electrical tunnel, encompasses cables for hot standby, cold shutdown and essential electric systems.

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2. Technical Specification Information

Technical Specification (TS) 3.3.3.7, "Fire Detection Instrumentation," Action a.2., requires establishment of an hourly firewatch when greater than 50% of the early warning detectors are inoperable for a given fire area/zone. The supervisory circuits associated with the detector alarms are functionally tested every 6 months per TS Surveillance Requirement 4.3.3.7.2. In addition, as part of the system functional test, the deluge valve is actuated to verify that a fire alarm on the local panel annunciates and that the valve functions correctly.

3. Work Processes

Administrative control of activities on safety related equipment is defined in Station Procedures. Activities involving maintenance of plant equipment is pre-planned and documented in the San Onofre Maintenance Management System (SOMMS). Prior to starting a plant maintenance activity, the proposed work must be reviewed and authorized. A Work Authorization Record (WAR) is issued by the Equipment Control section of the Operations Division which documents performance of the review and the authorization to perform the work. The WAR: 1) identifies the work to be accomplished, 2) documents the impact of the specific activity on the operability of the equipment involved, 3) identifies the plant conditions which must be established in order to safely perform the activity, and 4) specifies the functional testing requirements which must be completed prior to returning the affected equipment to service. For fire protection equipment, maintenance performs the retest and notifies Operations of the results. In accordance with procedures, a maintenance supervisor reviews all completed work packages to ensure that all test data is within the specified acceptance criteria. In the case of a failed surveillance, notification is made to the SRO Operations Supervisor in writing using a Notification of Unsuccessful Surveillance Form.

Station procedures require that nonconforming conditions be identified in a Nonconformance Report (NCR) and that once initiated, further activity to operate the affected equipment be prohibited until the nonconforming condition is evaluated and resolved by appropriate personnel.

At San Onofre Units 1, 2, and 3, when inoperable fire protection equipment [KP, KQ] is identified, the ESOs (non-utility, non-licensed), who are part of the Emergency Preparedness (EP) organization, are responsible for the establishment of appropriate compensatory measures required by the TS. Upon notification of a planned work activity or a failed surveillance, the Emergency Services Officers (ESOs) use impairment evaluation procedures to

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identify the inoperable fire protection equipment and to establish the appropriate compensatory measures pursuant to the TS Action requirements. The Fire Protection Engineering (FPE) group works in conjunction with the ESOs and is responsible for the review of the adequacy of fire protection systems.

C. DESCRIPTION OF THE EVENT:

1. Event:

On April 3, 1990, with Unit 3 operating at 100% power, FPE personnel (utility, non-licensed) reviewing an NCR (dated 3/30/90) recognized that a safety equipment building electrical tunnel supervisory system for fire detection and deluge actuation system (TSH8951) was inoperable and that appropriate compensatory measures had not been implemented as required by TS 3.3.3.7. Specifically, their review found that an hourly firewatch had not been posted in fire area/zone 3-SE-30-142A within one hour after the detection system was determined to be inoperable. At 1556 on April 3, 1990, an hourly firewatch was posted.

The subsequent investigation of this event determined that the supervisory system of TSH8951 had failed a TS surveillance test on August 7, 1989 and was not declared inoperable at that time. In addition, it was determined that the manual hand pull release on the deluge valve associated with fire detector TSH8954 had also failed the same TS surveillance test performed on August 7th. Both inoperable components are located within the same fire area/zone (3-SE-30-142A).

A review of fire impairment forms for fire area/zone 3-SE-30-142A, determined that hourly firewatches had not been posted as required by TS 3.3.3.7 between August 7, 1989 and April 3, 1990.

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

None.

3. Sequence of Events:

a. August 1989:

At 0636 on August 7, 1989, firewatches were posted in preparation for a routine TS surveillance of the actuation detectors outside of Unit 3 containment. The WAR was issued at 0922, and the TS surveillance test was subsequently performed. At 1500, following completion of the surveillance, the WAR was incorrectly closed by Maintenance and Operations

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as "work complete, ok for operable", although two components (TSH8954 and TSH8951) did not meet acceptance criteria. The equipment was declared operable and Operations notified the ESOs that the compensatory measures could be removed. The firewatch remained posted until 2218 on August 8, 1990.

At 1530 on August 7th, during a required review of surveillance results, maintenance supervision identified and formally notified the Shift Superintendent in writing that the TSH8951 supervisory alarm circuit and TSH8954 manual hand pull release had failed the required surveillances and maintenance orders to investigate the causes had been generated. Based upon this failed surveillance notification, the components should have been declared inoperable and the ESO notified to ensure that proper compensatory measures remained in place. However, this was not accomplished and at 2218 on August 8, 1989, the firewatch which had been posted for the performance of this surveillance was secured.

b. February 1990:

In February 1990, since TSH8951 and TSH8954 had been assumed to have been operable since August 1989 (when in fact they were inoperable), the routine six month TS required surveillance for TSH8951 and TSH8954 was scheduled to be performed. On February 4, 1990, a firewatch was posted. On February 5th at 2045 the WAR was issued covering both TSH8951 and TSH8954 and the TS surveillance was performed. Although no work had been done since August 1989, the surveillance on TSH8951 was completed satisfactorily. TSH8954 again failed the surveillance due to the manual pull handle. Although the results on TSH8954 were unsatisfactory, the WAR was signed as "work complete, ok for operable". At 1000 on February 6th the WAR was released and the ESO was notified that the fire impairment could be closed.

At approximately 1100 on February 6th, maintenance supervision formally notified Operations in writing that the surveillance for TSH8954 was still unsatisfactory; the mechanical pull station would not trip the deluge valve. The TSH8951 supervisory alarm circuit, which had failed its surveillance in August 1989, now tested satisfactory, although no corrective maintenance had been performed. In accordance with the revised administrative procedures which had been implemented as a result of corrective actions specified in LER 89-003 (Docket 50-362) Operations immediately notified the ESOs of a failed TS fire detection surveillance on TSH8954, and a firewatch was established for TSH8954 only within the TS required one hour time limit.

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c. March 1990:

On March 14, 1990, corrective maintenance on TSH8954 was performed and the detector tested satisfactorily. The hourly fire watch was secured for TSH8954 only on March 17th.

On March 27, 1990, a WAR was issued and the investigative maintenance order which had been initiated as a result of the failed surveillance in August 1989, was performed on TSH8951. The investigation revealed the need for the installation of a resistor to correct the supervisory system failure (see D.2.b below). At 1400 on March 27th, the work authorization was released. As the equipment was believed to be operable prior to the investigative MO, the WAR was closed by Maintenance and Operations as "work complete, ok for operable", and the ESOs were notified by Operations at 1459 that the fire impairment could be closed. The equipment was declared operable at 1520 and the firewatch was released on March 28, 1990, at 0853.

The investigative MO was revised to install a permanent resistor and an NCR was issued on March 30, 1990. The NCR center records indicate that the ESOs were notified of the fire protection NCR on March 30, 1990 at 1600 in accordance with the NCR procedure. The ESO log has no entry concerning this notification.

d. April 1990:

On April 3, 1990, FPE received the NCR documenting that the supervisory system for TSH8951 was not operable. At this time, it was recognized that a firewatch was required for TSH8951. The firewatch was established at 1556.

4. Method of Discovery:

As described in Section 3.d above.

5. Personnel Actions and Analysis of Actions:

At 1556 on April 3, 1990, the hourly firewatch was re-established to meet the requirements TS 3.3.3.7.

6. Safety System Responses:

Not applicable.

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D. CAUSE OF THE EVENT:

1. Immediate Cause:

In August 1989, ESOs were not properly informed of the surveillance failures. As a result, firewatches posted for the performance of the testing were removed prematurely upon the completion of the testing.

2. Root Cause:

- a. The missed firewatches were the result of a failure to declare the fire detectors inoperable in August 1989. Maintenance properly notified the Shift Superintendent (SS) in writing of the failed TS surveillances, however the necessary notification to the ESO was not made. The written notifications of failed surveillances which were provided by Maintenance to the SS are independent of the work authorization process.

Due to the time which has passed since the performance of the initial surveillance in August 1989, the verbal communications which took place between Operations and Maintenance personnel could not be recalled. However, following the fire protection equipment tests described above, Operations and Maintenance personnel documented on the WAR that work was complete and the equipment was operable. This was incorrect and apparently occurred because of verbal mis-communication between the Operator and the Maintenance worker. As a result, the verbal communication which did occur, was not sufficiently specific regarding the "as-left" state of equipment. Since the Operator believed the equipment to be operable, the WAR was released stating that the work was complete and the equipment was operable.

- b. The failure of the supervisory relay to drop out during surveillance testing is due to long detector loop cables (with its inherent capacitive leakage to ground) which can provide an intermittent current leakage path to ground to keep the relay energized. This leakage path to ground is very small, but is sufficient to keep the supervisory relay from actuating.
- c. The failure at the deluge valve associated with TSH8954 was at the local manual pull station. An adjustment was required to allow an overly compressed weight spring to function properly.

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E. CORRECTIVE ACTIONS:

1. Corrective Actions Taken:

- a. On 2/6/90 at 1137, as a result of the failure of the TSH8954 surveillance, an hourly firewatch was established in the affected UFHA area (this fire area includes TSH8951).
- b. On 4/03/90 at 1500, an hourly firewatch was established in the affected UFHA area upon the identification of the inoperability of TSH8951.
- c. Administrative controls required Operations to notify the ESO of failed fire protection surveillances in August 1989. These controls were revised in January 1990 to specifically address operability and firewatch posting requirements. The additional controls were not in place in August 1989; however, they were successfully utilized in February 1990 and a firewatch was posted as required.
- d. Emergency Preparedness personnel have been directed to ensure that each call concerning NCRs is appropriately logged.
- e. The local manual pull station associated with TSH8954 was adjusted and retested satisfactorily in accordance with procedures.

2. Planned Corrective Actions:

- a. The maintenance process, as it pertains to fire protection equipment, will be enhanced to ensure notifications of failed components result in timely posting of firewatches.
- b. A resistor will be installed in the supervisory circuit for TSH8951 which insures that there is sufficient voltage drop to de-energize (and actuate) the detector's trouble alarm relay.
- c. This event will be reviewed with Operations and Maintenance personnel to ensure that the importance of specific communications concerning the operability of equipment and the importance of fire impairments is understood.
- d. The deluge system supervisory circuit design is being evaluated to determine appropriate corrective actions. Based on this evaluation, corrective actions will be developed, as appropriate, and implemented.

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F. SAFETY SIGNIFICANCE OF THE EVENT:

Although a portion of the supervisory circuit was not operable, the actuation fire detector associated with TSH8951 always remained capable of performing its intended safety function. The mechanical hand pull on TSH8954 would not have precluded the deluge valve from functioning automatically if required. Therefore, there is no safety significance to this event since the inoperable equipment would not have prevented automatic actuation of fire detection and suppression equipment if needed.

Additionally, the fire area 3-SE-30-142A contains additional fire detection equipment. As a result of other inoperable fire protection systems, a firewatch was posted in this fire area for all but sixteen days since August 1989.

G. ADDITIONAL INFORMATION:

1. Component Failure Information:

Not applicable.

2. Previous LERs for Similar Events:

- a. LER 89-003 (Docket 50-362) discussed a similar event to establish a firewatch when an equipment building electrical tunnel supervisory system on an actuation detector failed. Corrective actions taken as a result of this event have aided in precluding the inappropriate termination of the hourly firewatch. However, as discussed in this current LER, additional enhancements are required.
- b. LER 89-023 (Docket 50-361) discussed the delinquent posting of an hourly firewatch. The root cause of this event was personnel error, and corrective actions could not have prevented this event.
- c. LER 89-024 (Docket 50-361) is attributed to an inadequate impairment evaluation which resulted from a failure to follow procedures. Corrective actions addressed the limitations of the Fire Protection Information System (FPIS) for evaluating equipment which impacts multiple UFHA fire area/zones.
- d. LER 90-001 (Docket 50-361) involved a missed firewatch due to a procedural inadequacy. Corrective actions involved changes to fire protection procedures and an upgrade of the fire protection impairment program, which could not have prevented this LER.

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- e. Similar failures to establish appropriate firewatches due to personnel error have been reported previously in LERs 84-034, 87-009, 88-033 (Docket No. 50-361) and 85-022 (Docket No. 50-361). LERs 85-022 (Docket No. 50-362) and 88-033 (Docket No. 50-361) were due to the failure to follow procedures.

3. Results of NPRDS Search:

Not applicable.