Southern California Edison Company

SAN ONOFRE NUCLEAR GENERATING STATION

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H. E. MORGAN STATION MANAGER

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August 2, 1989

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

Subject: Docket No. 50-206 30-Day Report Licensee Event Report No. 89-016 San Onofre Nuclear Generating Station, Unit 1

Pursuant to 10 CFR 50.73(d), this submittal provides the required 30-day written Licensee Event Report (LER) for an occurrence involving the fire protection system. Neither the health and safety of plant personnel or the public was affected by this occurrence.

If you require any additional information, please so advise.

incerely, HEMorgan

Enclosure: LER No. 89-016

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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FIRE PROTECTION SPRAY SYSTEM PLUGGED NOZZLES DUE TO BALL DRIP VALVE FAILURE																												
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On 6/29/89 with Unit 1 at 40% power, the air flow test of the lube oil reservoir and conditioner Fire Protection System (FPS) revealed that approximately 20 of the 78 FPS nozzles were plugged. It was determined on 7/3/89 that this condition could have precluded adequate fire suppression capability to certain areas. The Technical Specifications (TSs) require that a continuous fire watch be established for such a case, which existed prior to the surveillance. Since this condition was unknown at the time, a fire watch had not been previously established, constituting a violation of TSs.

The nozzle plugging was due to the accumulation of piping corrosion material inside the fire spray header and nozzles, which has been attributed to the failure of the ball drip valve associated with the header deluge valve. The ball drip valve is designed to drain normal, expected leakage of water past the deluge valve to preclude the accumulation of water in the header. The cause of the ball drip valve failure has been attributed to the slow buildup of corrosion products on its operating mechanism. Ball drip valves have not been included in any surveillances such that they would be periodically checked.

Air was systematically blown through the lube oil reservoir and conditioner area FPS piping and nozzle attachment points to ensure any corrosion debris and blockage were completely removed. The ball drip valve was replaced. The header air flow test was reperformed satisfactorily to ensure the spray nozzles are completely unobstructed. Periodic cleaning and inspection of the ball drip valves will be included in the FPS spray header surveillances performed every other refueling.

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Plant: San Onofre Nuclear Generating Station Unit: One Reactor Vendor: Westinghouse Event Date: June 29, 1989 Time: 1000

A. CONDITIONS AT TIME OF THE EVENT:

Mode: 1, Power Operation

B. BACKGROUND INFORMATION:

Technical Specification (TS) 3.14, "Fire Protection Systems (FPSs) [KP] Operability", provides the operability requirements for the FPSs, including lube oil reservoir and conditioner [LM] area spray system. With the spray system inoperable, a continuous fire watch with backup fire suppression equipment is required to be established in the unprotected area within one hour. TS 4.15, "FPSs Surveillance" requires surveillances be performed on the spray systems, including an air flow test through each accessible spray header every second refueling, to demonstrate the operability of each spray nozzle [NZL]. To perform the test, the spray header isolation valve is closed, and an air supply is connected to the spray header downstream of the isolation valve. Each spray nozzle is then verified to be unobstructed by noting air flow from the nozzle.

- C. DESCRIPTION OF THE EVENT:
 - 1. Event:

At 0900 on 6/29/89, with Unit 1 at approximately 40% power, an air flow test of the lube oil reservoir and conditioner area FPS spray header, which is required by TS 4.15.B(4), was initiated. In accordance with the work plan for performing the surveillance, which renders the spray header inoperable, the appropriate fire watch was established prior to initiating the test.

At 1000 on 6/29/89, the air flow test was completed. The test revealed low or no air flow through approximately 20 of the 78 FPS nozzles, indicating blockage of either the nozzles or piping to the nozzles. On 7/3/89, an evaluation of the status of the spray header concluded that this condition could have precluded adequate fire suppression capability to the lube oil area. Inoperability of the fire spray header, which existed prior to the surveillance, requires a continuous fire watch to be established. Since the spray header inoperability was unknown prior to performing the surveillance, a continuous fire watch had not been previously established, thus constituting a condition prohibited by TSs.

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	2.	Inoperable S Event:	Structures,	Systems or Components	that Contributed to	the	
		None.					
	3.	Sequence of	Events:				
		DATE	TIME	ACTION			
		6/29/89	0900	Commenced air flow t	est.		
			1000	Completed air flow to piping to the nozzle totally plugged.	est, 20 nozzles and/c s found partially or	r	
		7/3/89	1500	Completed evaluation spray header; concluc could have precluded suppression capabili	of the status of the ded that this conditi adequate fire ty to the lube oil ar	en.	
		7/8/89	2232	The lube oil area FP operable status foll successful testing.	S was returned to owing repairs and		

4. Method of Discovery:

When conducting the lube oil area FPS air flow test surveillance pursuant to TS 4.15.B(4), 20 of 78 nozzles exhibited low or no air flow. An evaluation completed on 7/3/89 concluded that this condition could have precluded adequate fire suppression capability to the lube oil area.

5. Personnel Actions and Analysis of Actions:

Not applicable.

6. Safety System Responses:

Not applicable.

D. CAUSE OF THE EVENT:

1. Immediate Cause:

Plugging of the nozzles and/or piping was attributed to the accumulation of piping corrosion material inside the fire spray header and nozzles.

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2. Intermediate Cause:

The cause of the piping corrosion has been attributed to the failure of the ball drip valve [LOV] associated with the fire spray header deluge valve [ISV]. The ball drip valve is designed to drain normal, expected leakage of water past the deluge valve to preclude the accumulation of water in the header. Post-testing inspection of the FPS revealed that the ball drip valve had failed in its "closed" position. This failure allowed minor leakage through the deluge valve to accumulate in the piping header, which may have accelerated the normal rate of carbon steel piping corrosion.

3. Root Cause:

The cause of the ball drip valve failure has been attributed to the slow buildup of corrosion products on its operating mechanism. Ball drip valves have not been included in any surveillances such that they would be periodically checked, thus allowing the undetected buildup of corrosion products in the ball drip valve.

E. CORRECTIVE ACTIONS:

- 1. Corrective Actions Taken:
 - a. Air was systematically blown through the lube oil reservoir and conditioner area FPS piping and nozzle attachment points to ensure any corrosion debris and blockage were completely removed.
 - b. The ball drip valve was replaced.
 - c. The header air flow test was reperformed satisfactorily to ensure the spray nozzles were completely unobstructed.
- 2. Planned Corrective Actions:

The periodic cleaning and inspection of the ball drip valves will be included in the FPS spray header surveillances performed every other refueling.

F. SAFETY SIGNIFICANCE OF THE EVENT:

The safety significance of the event is minimized by the following: 1) the Fire Detection System located in the lube oil reservoir and conditioner area was operable during plant operation, which would have provided warning to the onsite fire department and would have ensured a quick response in case of fire; 2) the portable fire extinguishers and manual hose stations in the lube oil reservoir and conditioner area were operable during plant operation; and 3) 58 of the 78 spray nozzles in the lube oil reservoir and conditioner area remained available for suppression. The

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combination of the available fire protection equipment in the area would have enabled fire response personnel to extinguish a fire.

G. ADDITIONAL INFORMATION:

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1. Component Failure Information:

The ball drip valve was manufactured by the Gem Sprinkler Company. This 1" valve is used on 4 and 6 inch deluge valves, Multimatic Valve, Model A-4.

- 2. Previous LERs for Similar Events:
 - a. LER 88-021 (Docket No. 50-206)

FPS spray nozzles in the containment secondary shield area were clogged due to excessive corrosion in the carbon steel piping system caused by minor leakage of borated water from normal recirculation of the refueling water storage tank through the containment FPS spray isolation valve. In addition, the open-nozzle design allowed the humid containment atmosphere into the piping, contributing to the amount of corrosion. Corrective actions included: 1) performing an air blow of the piping and nozzle attachment points; 2) cleaning the orificed drain lines on the main header; 3) replacing all existing secondary shield nozzles with new non-clogging type nozzles; and 4) performing a final air flow test prior to returning the FPS to service. Additionally, during the next refueling outage, the air flow test will be re-performed to verify the long-term adequacy of the corrective actions discussed above. These corrective actions did not affect a faulty ball drip valve, and thus did not prevent this event.

b. LER 85-016 (Docket No. 50-206)

FPS spray nozzles in the generator hydrogen seal oil area were clogged due to an excessive amount of rust in the piping system. Corrective actions included cleaning the nozzles and blowing the piping down with air. These corrective actions did not affect a faulty ball drip valve, and thus did not prevent this event.

3. Results of NPRDS Search:

Not applicable.