SOUTHERN CALIFORNIA EDISON
An EDISON INTERNATIONAL Company

R. W. Krieger
Vice President
Nuclear Generation

October 28, 1996

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

Subject: Docket Nos. 50-361 and 50-362
Voluntary Report
Licensee Event Report No. 96-008
San Onofre Nuclear Generating Station, Units 2 and 3

This submittal provides a voluntary report for a condition involving the Reactor Coolant Pump oil collection system. Since this condition is applicable to Units 2 and 3, a single report for Unit 2 is being submitted in accordance with NUREG-1022. Neither the health nor the safety of plant personnel or the public was affected by this occurrence.

Sincerely,

Enclosure: LER No. 96-008

cc: L. J. Callan, Regional Administrator, NRC Region IV
J. E. Dyer, Director, Division of Reactor Projects, NRC Region IV
K. E. Perkins, Jr., Director, Walnut Creek Field Office, NRC Region IV
J. A. Sloan, NRC Senior Resident Inspector, San Onofre Units 2 & 3
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LICENSEE EVENT REPORT (LER)

Facility Name (1)	Docket Number (2)	Page (3)
SAN ONOFRE NUCLEAR GENERATING STATION, UNIT 2	0 5 0 0 0 3 6 1	1 of 0 5

Title (4)

Reactor Coolant Pump Oil Collection System - Voluntary Report

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)
				---	---				SONGS Unit 3	0 5 0 0 0 3 6 2
0 9	2 6	9 6	9 6	0 0 8	0 0	1 0	2 8	9 6		0 5 0 0 0 | |

OPERATING MODE (9)	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10CFR (Check one or more of the following) (11)					
1	___ 20.402(b)	___ 20.405(c)	___ 50.73(a)(2)(iv)	___ 73.71(b)		
POWER LEVEL (10) 1 0 0	___ 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)	xx 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)			

Voluntary Report

LICENSEE CONTACT FOR THIS LER (12)

Name	TELEPHONE NUMBER AREA CODE
R. W. Krieger, Vice President, Nuclear Generation	7 1 4 3 6 8 - 6 2 5 5

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

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	///////	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	///////
					///////						///////
					///////						///////

SUPPLEMENTAL REPORT EXPECTED (14)		Expected Submission Date (15)	Month	Day	Year
___ Yes (If yes, complete EXPECTED SUBMISSION DATE)	___ xx NO				

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

San Onofre Unit 2 License Condition 2.C(14) and Unit 3 License Condition 2.C(12) require conformance with the Updated Fire Hazards Analysis (UFHA). UFHA Section 3.2.2B states that "A reactor coolant pump (RCP) lube oil collection system, designed to 10CFR50, Appendix R, Section III.O criteria, is provided to divert oil leaks to isolated containers so that leaking oil is prevented from coming into contact with high temperature components and becoming a fire hazard."

On September 26, 1996, with Unit 3 in Mode 5 during a maintenance outage, an Edison engineer performing an equipment walk down, noticed that the sightglass and mounting extended slightly beyond the lateral limits of the oil collection system drip pan, and that a few drops of leaking oil were not being collected by the lube oil collection system.

Based on the installed oil collection system and a review of historical data, Edison believes the threaded and/or welded connections were not considered to be potential leakage sites in the initial Bechtel design. Due to the passage of time, the root cause for Bechtel's initial design can not be determined. Edison is evaluating the current configuration of the lube oil collection system and will make physical modifications to the system if appropriate. In the interim, enhanced RCP oil level monitoring is being performed.

There is no safety significance to the points identified that were not provided with collection capability.

Plant: San Onofre Nuclear Generating Station (SONGS), Units 2 and 3
Reactor Vendor: Combustion Engineering
Mode: Unit 2 Mode 1, Unit 3 Mode 5
Power: Unit 2 - 100 percent, Unit 3 - 0 percent
Event Date: September 26, 1996

BACKGROUND

San Onofre Unit 2 License Condition 2.C(14) and Unit 3 License Condition 2.C(12) require conformance with the Updated Fire Hazards Analysis (UFHA). UFHA Section 3.2.2B states that "A reactor coolant [AB] pump [P] (RCP) lube oil collection system, designed to 10CFR50, Appendix R, Section III.O criteria, is provided to divert oil leaks to isolated containers so that leaking oil is prevented from coming into contact with high temperature components and becoming a fire hazard." 10CFR50, Appendix R, Section III.O requires that reactor coolant pumps be equipped with an oil collection system if the containment is not inerted during normal operations, and states in part:

"[The oil collection system]... shall be capable of collecting lube oil from all potential pressurized and unpressurized leakage sites in the reactor coolant pump lube oil systems.... Leakage points to be protected shall include lift pump and piping, overflow lines, lube oil cooler, oil fill and drain lines and plugs, flanged connections on oil lines, and lube oil reservoirs where such features exist on the reactor coolant pumps." (Emphasis added)

DESCRIPTION OF EVENT

On September 26, 1996, with Unit 3 in Mode 5 during a maintenance outage, an Edison engineer performing an equipment walk down, noticed that the sightglass [LG] and mounting extended slightly beyond the lateral limits of the oil collection system drip pan, and that a few drops of leaking oil had not been collected by the lube oil collection system.

Edison confirmed that this situation exists on the three Siemens Allis RCP motors [MO] (the fourth RCP motor was manufactured by ABB and does not have the sightglass deficiency). Based on this observation, Edison re-inspected the RCP lube oil collection system and noted other mechanical connections which appear to have been considered as non-potential leakage points in the initial design; but in retrospect, it would be prudently conservative to provide collection capability. Edison intends to improve the oil collection system by reviewing and modifying the system as appropriate, for the mechanical connections listed below:

Circulating Oil System:

threaded pipe connections (this includes 2 resistance temperature detectors, 2 flow transmitters [FT], 1 pressure transmitter [PT], and 10 lube oil cooler [CLR] fill and drain plugs),

Anti-Reverse Rotational Device System:

threaded pipe connections (this includes 1 flow transmitter, 1 differential pressure transmitter [PDT], 2 check valves, and an oil filter),

Lower Lube Oil System:

sightglass

2 vents (above oil level, not pressurized)

Although Edison has not inspected the Unit 2 RCP oil collection systems, it is believed a similar condition exists at Unit 2.

Edison is voluntarily submitting this report due to NRC interest.

CAUSE OF THE EVENT

Based on the installed oil collection system and a review of historical data, Edison believes the threaded and/or welded connections were not considered to be potential leakage sites in the initial Bechtel design. Due to the passage of time, the root cause for Bechtel's initial design can not be determined. However, as discussed below, this condition has no safety significance.

CORRECTIVE ACTIONS

Edison performed an operability assessment which documented the acceptability of continued operation of Units 2 and 3.

The oil collection pans in the vicinity of the Unit 3 lower oil reservoir sightglasses were modified to collect any potentially leaking oil. The corresponding oil collection pans at Unit 2 will be modified during the next refueling outage.

Edison is evaluating the current configuration of the lube oil collection system and will make physical modifications to the system if appropriate. In the interim, enhanced RCP oil level monitoring is being performed.

Edison has preliminarily reviewed the lube oil fire incident at Arkansas Nuclear One (ANO) to determine if SONGS Units 2 and 3 were susceptible to a similar event. Significant design and material differences exist between ANO and SONGS, which would preclude a similar event. Of the design differences that exist between San Onofre and ANO, the most significant is the design of the RCP high pressure section of the oil lift system - at San Onofre, this portion of the system is fully enclosed (unlike the system at ANO). In addition, the insulation [ISL] system used at SONGS for components in this area will not absorb oil as did the insulation at ANO. ANO uses a fibrous material that has a thin metal cladding. SONGS utiiizes a metal reflective insulation that consist of stainless steel jackets with air baffles of stainless steel foil inside. There is no fibrous material to absorb and wick oil as occurred at ANO.

SAFETY SIGNIFICANCE

Units 2 and 3 use a synthetic motor oil (Mobil SHC 626) having a flash point of 440 degrees F(MSDS), and an auto ignition temperature of 720 degrees F. NFPA 321, Standard for Basic Classification of Flammable

and Combustible Liquids, separates liquids into five classifications. SHC 626 is considered a class III B liquid which is the least hazardous of the five classifications (based on flash point).

Based on a review of HVAC drawings, approximately 110,000 cubic feet/minute of air flow is circulated through each of the two compartments containing RCP's. This large quantity of air flow prevents the accumulation of flammable vapors, and exceeds safe ventilation rates for combustible and flammable liquid processing facilities as defined in NFPA 30, Combustible and Flammable Liquids Code. As such, there would be an insufficient concentration to support vapor combustion in this area.

A substantial quantity of oil would not accumulate on high temperature objects. The RCS piping, steam generators, and pressurizer are protected with metal, not blanket, insulation which cannot absorb nor retain significant amounts of oil. Because the temperature of the piping is greater than the flash point of the oil, small amounts of vapor may be generated. However, RCS cold leg, hot leg, and steam generator temperature (between 555 and 610 degrees F), and the pressurizer temperature (approximately 653 degrees F) are below the liquid auto ignition temperature of 720 degrees F. There are no surfaces with temperatures near the 700 degree F range in the steam generator compartments.

At nuclear facilities which have experienced RCP lube oil fires, such as Haddam Neck (ref: Information Notice 94-58) and ANO Unit 1, the RCS piping insulation was a porous mineral fiber which allowed oil to soak, saturate, and continuously maintain contact with the hot surface. This condition might have added to spontaneous heating and, ultimately, ignition of the oil-soaked material. The SONGS 2 and 3 RCS insulation is not leak tight at the bottom; hence, any oil managing to penetrate the circumference of the metal insulation would likely drain away from the hot piping. Although a design basis fire inside containment is postulated in the UFHA, a fire involving oil leakage due to the above described configurations is not expected.

The sightglass for the lower oil reservoir is not pressurized; therefore, any leakage will result in oil dripping onto relatively cool components below the sightglass and not being sprayed onto SG or RCP components. The lower lube oil reservoir holds 30 gallons of SHC 626. Approximately half of this volume would be expected to drain from the reservoir if the sightglass were to fail.

In reviewing Bechtel's initial decision not to enclose threaded connectors, it was noted that all of the threaded fittings are treated with Permatex [or a similar material]. This is designed to assure proper fit, lock-in threaded connections and prevent leaks. A review of Maintenance Orders dating back to 1984 indicates no incidents of leakage from threaded connections for the devices described above. These types of connections may potentially exhibit leakage. However, the leakage would be minor, intermittent drops, and not a continuous stream. Any weepage would not result in significant accumulation or pooling of lube oil.

The oil filter assembly is also a threaded connection, but is additionally secured with an O-ring and fasteners. The fasteners provide adequate assurance that the filter will not vibrate off or catastrophically fail. As with the other threaded connections, any leakage from the filter would be insignificant. While this does not guarantee leakage will not occur, it does indicate that any leakage that would occur is expected to be minor, such as intermittent drops. As the threaded connectors are attached to supports and seismic 1 piping configurations, there are no unusual forces that would act on any of the threaded connections to loosen them.

An evaluation, to determine the effects of a design basis earthquake on the sightglass, concluded the sightglass installation will not catastrophically fail during a design basis earthquake, and any leakage induced by the event would be minor. As described in Information Notice 84-09, Section XII, an acceptable level of protection is provided without a lube oil collection system where it can be shown that there are no potentially significant leakage points.

Leakage in any significant quantity will be detected by the lube oil reservoir level indicating system and attendant low level alarms. The RCP motor bearing temperature would also provide indication of a problem with the lube oil system.

The steam generator rooms, where the RCPs are located, have been analyzed for a fire with the assumption that the oil from both RCPs is involved. Any fire that does occur would be readily detected by heat detectors which actuate alarms in the control room. This detection would also actuate the pre-trip deluge system for the associated area. Upon confirmation of the fire, the containment isolation valve is opened, initiating the deluge system. The fire would be controlled or extinguished shortly thereafter. The fire detection and suppression system is designed to control or extinguish the fire before it adversely impacts the adjacent RCP or spreads to an adjacent fire zone. Edison believes the ability to safely shutdown the reactor and maintain it in a safe shutdown condition has been fully maintained.

The effect of lube oil collection in the sump during a LOCA event would not adversely impact ECCS functions during recirculation. During recirculation there is greater than 300,000 gallons of water collected in the sump. The comparatively small quantity of oil from the RCPs would collect and remain on the surface of the water.

The Lower Lube Oil System vents are always above the oil level in the lube oil reservoir and, therefore, are not considered a significant potential leakage point.

In summary, there is no safety significance to the points identified that were not provided with collection capability.

Additional Information:

Edison has not submitted any LERs within the past three years related to comformance with 10 CFR 50, Appendix R.