

REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR: 8806180085 DOC. DATE: 88/06/06 NOTARIZED: NO DOCKET #
 FACIL: 50-361 San Onofre Nuclear Station, Unit 2, Southern California 05000361
 AUTH. NAME AUTHOR AFFILIATION
 MORGAN, H. E. Southern California Edison Co.
 RECIP. NAME RECIPIENT AFFILIATION

SUBJECT: LER 88-010-00: on 880506, both emergency chilled water sys
 trains declared inoperable due to low freon level. Operating
 guidelines for maintaining freon level in emergency
 developed & procedures revised. W/880606 ltr.

DISTRIBUTION CODE: IE22D COPIES RECEIVED: LTR 1 ENCL 1 SIZE: 2
 TITLE: 50.73 Licensee Event Report (LER), Incident Rpt, etc.

NOTES:

	RECIPIENT		COPIES			RECIPIENT		COPIES	
	ID CODE/NAME		LTR	ENCL		ID CODE/NAME		LTR	ENCL
	PD5 LA		1	1		PD5 PD		1	1
	HICKMAN, D		1	1					
INTERNAL:	ACRS MICHELSON		1	1	ACRS MOELLER		2	2	
	AEOD/DOA		1	1	AEOD/DSP/NAS		1	1	
	AEOD/DSP/ROAB		2	2	AEOD/DSP/TPAB		1	1	
	ARM/DCTS/DAB		1	1	DEDRO		1	1	
	NRR/DEST/ADS 7E		1	0	NRR/DEST/CEB 8H		1	1	
	NRR/DEST/ESB 8D		1	1	NRR/DEST/ICSB 7		1	1	
	NRR/DEST/MEB 9H		1	1	NRR/DEST/MTB 9H		1	1	
	NRR/DEST/PSB 8D		1	1	NRR/DEST/RSB 8E		1	1	
	NRR/DEST/SGB 8D		1	1	NRR/DLPQ/HFB 10		1	1	
	NRR/DLPQ/QAB 10		1	1	NRR/DOEA/EAB 11		1	1	
	NRR/DREP/RAB 10		1	1	NRR/DREP/RPB 10		2	2	
	NRR/DRIS/SIB 9A		1	1	NUDDCS-ABSTRACT		1	1	
	REC FILE 02		1	1	RES TELFORD, J		1	1	
	RES/DE/EIB		1	1	RES/DRPS DEPY		1	1	
	RGNS FILE 01		1	1					
EXTERNAL:	EG&G WILLIAMS, S		4	4	FORD BLDG HOY, A		1	1	
	H ST LOBBY WARD		1	1	LPDR		1	1	
	NRC PDR		1	1	NSIC HARRIS, J		1	1	
	NSIC MAYS, G		1	1					

TOTAL NUMBER OF COPIES REQUIRED: LTR 45 ENCL 44

LICENSEE EVENT REPORT (LER)

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

Title (4) INOPERABILITY OF BOTH EMERGENCY CHILLED WATER SYSTEM (ECWS) TRAINS DUE TO LOW FREON LEVEL

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 5	0 6	8 8	8 8	0 1 0	0 0	0 6	0 6	8 8	SONGS, UNIT 3	0 5 0 0 0 3 6 2	

OPERATING MODE (9) 1
 POWER LEVEL (10) 1 0 0
 THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10CFR (Check one or more of the following) (11)

<input type="checkbox"/> 20.402(b)	<input type="checkbox"/> 20.405(c)	<input type="checkbox"/> 50.73(a)(2)(iv)	<input type="checkbox"/> 73.71(b)
<input type="checkbox"/> 20.405(a)(1)(i)	<input type="checkbox"/> 50.36(c)(1)	<input checked="" type="checkbox"/> 50.73(a)(2)(v)	<input type="checkbox"/> 73.71(c)
<input type="checkbox"/> 20.405(a)(1)(ii)	<input checked="" type="checkbox"/> 50.36(c)(2)	<input checked="" type="checkbox"/> 50.73(a)(2)(vii)	<input type="checkbox"/> Other (Specify in
<input type="checkbox"/> 20.405(a)(1)(iii)	<input checked="" type="checkbox"/> 50.73(a)(2)(i)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)	Abstract below and
<input type="checkbox"/> 20.405(a)(1)(iv)	<input type="checkbox"/> 50.73(a)(2)(ii)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)	in text)
<input type="checkbox"/> 20.405(a)(1)(v)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(x)	

LICENSEE CONTACT FOR THIS LER (12)

Name H. E. Morgan, Station Manager TELEPHONE NUMBER AREA CODE 7 1 4 3 6 8 - 6 2 4 1

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
X	K M	C H U	C 1 4 7	NO					

SUPPLEMENTAL REPORT EXPECTED (14)
 Yes (If yes, complete EXPECTED SUBMISSION DATE) NO
 Expected Submission Date (15)

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

At 0745 on May 6, 1988, with Unit 2 operating at 100% power and Unit 3 in cold shutdown, Train 'A' of the Emergency Chilled Water System (ECWS) was declared inoperable as a result of a low freon level in Emergency Chiller ME336. Since the Train 'B' Control Room Isolation System (CRIS) monitor (2/3RT-7825) was inoperable at the time, the operators elected to manually start Train 'B' Control Room Emergency Air Cleanup System, which automatically started Emergency Chiller ME335. At 0800, ME335 tripped on low refrigerant temperature, due to low freon level, thereby rendering ECWS Train 'B' inoperable. Since Technical Specification (TS) 3.7.10 for ECWS does not address inoperability of both ECWS trains, this constituted entry into TS 3.0.3. At 0859, a power reduction commenced. At 1135, following the addition of freon and successful testing, ME336 was declared operable and TS 3.0.3 was exited. The power reduction was terminated at this time.

No guidance had been provided by the vendor of the emergency chillers regarding an acceptable freon range. Because design requirements regarding acceptable freon levels were not specified, freon level requirements were not adequately addressed in Station procedures.

As corrective action, operating guidelines for maintaining freon level in the emergency chillers have been developed. Appropriate procedures will be revised to incorporate these guidelines.

8806160085 880606
 PDR ADOCK 05000361
 S PDR

IE22
 111

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

SAN ONOFRE NUCLEAR GENERATION STATION UNIT 2	DOCKET NUMBER 05000361	LER NUMBER 88-010-00	PAGE 2 OF 6
---	---------------------------	-------------------------	----------------

Plant: San Onofre Nuclear Generating Station (SONGS)
 Units: 2 and 3
 Reactor Vendor: Combustion Engineering
 Event Date: 05-06-88
 Time: 0800

A. CONDITIONS AT TIME OF THE EVENT:

Unit 2 was operating in Mode 1 with reactor power at 100%. Unit 3 was in Mode 5 (Cold Shutdown) for a refueling outage.

B. BACKGROUND INFORMATION:

The Emergency Chilled Water System (ECWS) (EIIS System Code KM) serves to provide chilled water to remove heat from air conditioning cooling coils that are in service during emergency conditions. These include air conditioning for the Control Room Emergency Air Cleanup System (CREACUS), Engineered Safety Feature (ESF) switchgear room, charging pump rooms, boric acid makeup pump rooms, fuel handling pump room, High-Pressure Safety Injection (HPSI)/Low-Pressure Safety Injection (LPSI)/Containment Spray pump rooms, and Component Cooling Water (CCW) pump rooms.

There are two independent ECWS trains that are common to Units 2 and 3. Each of the ECWS trains is provided with a 100% capacity emergency chiller (EIIS Component Code CHU). The chillers are normally in standby, and start upon receipt of a signal from the Safety Injection Actuation System (SIAS), Toxic Gas Isolation System (TGIS), Control Room Isolation System (CRIS), or Fuel Handling Isolation System (FHIS). CREACUS is designed to automatically start upon receipt of a TGIS or CRIS signal.

C. DESCRIPTION OF THE EVENT:

1. Event:

At 0745 on May 6, 1988, with Unit 2 operating at 100% power and Unit 3 in cold shutdown, Train 'A' of the ECWS was declared inoperable as a result of a low freon level in Emergency Chiller ME336. Since the Train 'B' CRIS monitor (2/3RT-7825) was inoperable at the time, the operators elected to manually start Train 'B' CREACUS, which automatically started Emergency Chiller ME335. At 0800, ME335 tripped on low refrigerant temperature, thereby rendering ECWS Train 'B' inoperable. Since Technical Specification (TS) 3.7.10 for ECWS does not address inoperability of both ECWS trains, this constituted entry into TS 3.0.3. At 0859, a power reduction commenced. At 1135, following the addition of freon and successful testing, ME336 was declared operable and TS 3.0.3 was exited. The power reduction was terminated at this time.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

SAN ONOFRE NUCLEAR GENERATION STATION UNIT 2	DOCKET NUMBER 05000361	LER NUMBER 88-010-00	PAGE 3 OF 6
---	---------------------------	-------------------------	----------------

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

Since the Train 'B' CRIS monitor (2/3RT-7825) was inoperable when ME336 was declared inoperable, operators elected to manually start Train 'B' CREACUS, which automatically started Train 'B' ECWS.

3. Sequence of Events:

<u>DATE</u>	<u>TIME</u>	<u>ACTION</u>
5/5	Grave- yards	Procedural guidance issued on proper freon level. Low freon level in Emergency Chiller ME336 was noted.
5/6	0745	Train 'A' emergency chilled water system declared inoperable. Train 'B' CREACUS was manually actuated.
5/6	0800	Train 'B' emergency chilled water system declared inoperable following tripping of ME335 on low refrigerant temperature. Technical Specification 3.0.3 entered.
5/6	0859	Unit 2 power reduction initiated.
5/6	1135	Train 'A' emergency chilled water system declared operable following return to service of ME336. Technical Specification 3.0.3 exited.

4. Method of Discovery:

Low freon level in ME336 was discovered during routine operator rounds. Control Room annunciation alerted the operators to the trip of ME335 on low refrigerant temperature.

5. Personnel Actions and Analysis of Actions:

When ME335 tripped on low refrigerant temperature, an entry into Technical Specification 3.0.3 was appropriately declared, and within one hour, a power reduction was initiated.

6. Safety System Responses:

Not Applicable.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

SAN ONOFRE NUCLEAR GENERATION STATION UNIT 2	DOCKET NUMBER 05000361	LER NUMBER 88-010-00	PAGE 4 OF 6
---	---------------------------	-------------------------	----------------

D. CAUSE OF THE EVENT:

1. Immediate Cause:

ME336

ME336 was declared inoperable at 0745 on May 6, 1988, due to low freon level.

ME335

ME335 was declared inoperable at 0800 on May 6, 1988, when it tripped on low refrigerant temperature.

2. Intermediate Cause:

ME336

ME336 had a small, known freon leak that required the addition of freon to the chiller periodically. A Maintenance Order (MO) had been generated to add freon to ME336 on April 2, 1988, after an operator had noted the freon level in the sight glass to be low. However, the priority assigned to the MO, per procedure, did not ensure that freon was added in a timely manner. The chiller had worked properly for the Technical Specification required monthly 10-hour CREACUS surveillance on April 14 and on several occasions following the surveillance.

On May 5, 1988, procedural guidance was issued requiring, as a pre-start check of the emergency chillers, that freon be visible in the sight glass. At the time of issuance, operability of the chiller was questioned when no freon level was observed in the sight glass. Subsequently, on May 6, 1988, it was concluded that ME336 should be declared inoperable.

ME335

The chiller had operated properly for the Technical Specification required monthly 10-hour CREACUS surveillance on April 28 and on several occasions following the surveillance with the existing freon level. However, the lower than normal condensing water (CCW) temperature during this event caused a larger quantity of freon to accumulate in the condenser section during startup. This resulted in a low freon level in the cooler section. Under these conditions, inadequate freon level in the cooler results in insufficient transfer of heat from the chilled water cooling coils to the freon. This can result in lowering of the freon temperature to the low refrigerant temperature trip setpoint. At the time, freon level was believed to be adequate for operability of the chiller and, therefore, no measures had been taken to add freon.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

SAN ONOFRE NUCLEAR GENERATION STATION UNIT 2	DOCKET NUMBER 05000361	LER NUMBER 88-010-00	PAGE 5 OF 6
---	---------------------------	-------------------------	----------------

3. Root Cause:

No guidance had been provided by the vendor of the emergency chillers regarding an acceptable freon range. Because design requirements regarding acceptable freon levels were not specified, freon level requirements were not adequately addressed in Station procedures.

E. CORRECTIVE ACTIONS:

1. Corrective Actions Taken:

- a) Freon has been added to both emergency chillers.
- b) Operating guidelines developed by the SCE engineering organization with assistance from the chiller vendor, for acceptable freon levels in the emergency chillers, have been established.
- c) Freon leaks in ME336 have been repaired.

2. Planned Corrective Actions:

- a) Appropriate operating instructions will be revised to incorporate acceptable operating guidelines for freon level.
- b) Investigation into modifying the control system of the emergency chillers in order to optimize critical performance parameters (e.g., condensing water temperature, freon level), is currently underway. In addition, continued testing will be performed to further establish the optimal operating range for freon level. These actions may allow deviation from the conservative limits established for the freon level.
- c) The procedure governing the prioritization of maintenance on the emergency chillers will be revised to elevate the priority of future work associated with the emergency chillers.

F. SAFETY SIGNIFICANCE OF THE EVENT:

The emergency chilled water system serves to remove heat from air conditioning cooling coils that are in service during emergency conditions. During the approximately three and one-half hour period that both emergency chillers were inoperable, the normal chilled water system was in operation. If an emergency condition had arisen during this period, there would have been additional heat loads on both the CCW system and the ECWS. The subsequent increase in CCW temperature would have favorably affected the drop in refrigerant temperature and would have allowed the chiller to properly start and continue running.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

SAN ONOFRE NUCLEAR GENERATION STATION UNIT 2	DOCKET NUMBER 05000361	LER NUMBER 88-010-00	PAGE 6 OF 6
---	---------------------------	-------------------------	----------------

G. ADDITIONAL INFORMATION:

1. Component Failure Information:

The emergency chillers are hermetic centrifugal liquid chillers manufactured by the Carrier Corporation, Serial Nos. 23903 and 23904, for Emergency Chillers ME335 and ME336, respectively.

2. Previous LERs on Similar Events:

None.

Southern California Edison Company

SAN ONOFRE NUCLEAR GENERATING STATION

P. O. BOX 128

SAN CLEMENTE, CALIFORNIA 92672

H. E. MORGAN
STATION MANAGER

TELEPHONE
(714) 368-6241

June 6, 1988

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

Subject: Docket No. 50-361
30-Day Report
Licensee Event Report No. 88-010
San Onofre Nuclear Generating Station, Units 2 and 3

Pursuant to 10 CFR 50.36(c)(2) and 10 CFR 50.73(a)(2)(i), (v), and (vii), this submittal provides the required 30-day written Licensee Event Report (LER) for an occurrence involving the inoperability of both Emergency Chilled Water System (ECWS) Trains. Since this event involved systems shared between Units 2 and 3, a single report is being submitted in accordance with NUREG-1022. Neither the health and safety of plant personnel nor the health and safety of the public was affected by this occurrence.

If you require any additional information, please so advise.

Sincerely,

H. E. Morgan

Enclosure: LER No. 88-010

cc: F. R. Huey (USNRC Senior Resident Inspector, Units 1, 2 and 3)
J. B. Martin (Regional Administrator, USNRC Region V)
Institute of Nuclear Power Operations (INPO)

IEC2
11