NRC Form 366
(9-83)

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED OMB NO. 3150-0104
EXPIRES: 8/31/88

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
RANCHO SECO NUCLEAR GENERATING STATION UNIT NO. 1	0 5 0 0 0 3 1 2	1 OF 0 2

TITLE (4)

REACTOR TRIP ON HIGH RCS PRESSURE

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)
											NONE	0 5 0 0 0
1 0	0 2	8 5	8 5	—	0 1 9	—	0 0	1 0	2 9	8 5		0 5 0 0 0

OPERATING MODE (9)		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)			
N		20.402(b)	20.405(c)	X 50.73(a)(2)(iv)	73.71(b)
POWER LEVEL (10)		20.405(a)(1)(i)	X 50.36(c)(1)	50.73(a)(2)(v)	73.71(c)
0 1 4		20.405(a)(1)(ii)	50.36(c)(2)	50.73(a)(2)(vii)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)
		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)(ix)	

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER
Ron W. Colombo, Regulatory Compliance Supervisor	AREA CODE 9 1 6 4 5 2 - 3 2 1 1

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)	X NO				

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

On October 2, 1985, at 0132 hours, a reactor trip occurred while operating at approximately 14 percent of full power. Prior to the trip the reactor had been operating at 40 percent of full power and power had been reduced in preparation for performing a turbine overspeed trip test. The reactor trip was preceded by a low condenser vacuum and a trip of main feedwater pump "A". Following the reactor trip the plant underwent a transient in which the reactor coolant system temperature decreased approximately 70 degrees in 20 minutes. This cooldown rate is in excess of Technical Specification 3.1.2.2 limit and is being reported in accordance with the requirements of 10 CFR 50.36(c)(1).

High pressure injection (HPI) flow was manually initiated during the cooldown to maintain pressurizer level. The rapid cooldown was attributed to excessive steam loads caused by two open relief valves on the 4A feedwater heater.

The District submitted to the NRC in a letter dated October 18, 1985, a list of planned actions to address this event and the timetable for completing these actions.

There were no effects on public or plant safety as a result of this event.

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NRC Form 366
(9-83)

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
RANCHO SECO NUCLEAR GENERATING STATION UNIT NO. 1	0 5 0 0 0 3 1 2	8 5	— 0 1 9	— 0 0	0 2 OF 0 2

TEXT (If more space is required, use additional NRC Form 366A's) (17)

On October 2, 1985, at 0132 hours, a reactor trip occurred while operating at approximately 14 percent of full power. Prior to the trip the reactor had been operating at 40 percent of full power and power had been reduced to 15 percent in preparation for performing a turbine overspeed trip test. The reactor trip was preceded by a low condenser vacuum and a trip of main feedwater pump "A".

Following the reactor trip, the plant underwent a transient in which the reactor coolant system temperature decreased approximately 70 degrees in 20 minutes. During the cooldown, high pressure injection (HPI) flow was manually initiated to maintain pressurizer level. The rapid cooldown was attributed to excessive steam loads caused by two open relief valves on the 4A feedwater heater. The cooldown rate was in excess of the 100 °F/hour limit given in Technical Specification 3.1.2.2 and is being reported in accordance with 10 CFR 50.36(c)(1). It should be noted that the 10 CFR Appendix G requirements were not violated during the transient. The violation of the 100°F/hour technical specification limit was logged for consideration in future cumulative cycle fatigue analysis. The transient was evaluated by the NSSS vendor (Babcock & Wilcox) and determined not to have resulted in possible pressure boundary degradation.

A listing of the sequence of events for the reactor trip and cooldown transient is attached for information.

In an October 18, 1985, letter to the NRC's Director of Nuclear Reactor Regulation, the District submitted a list of planned actions to address this event and the timetable is complete these actions.

There were no effects on public or plant safety as a result of this event.

II. SEQUENCE OF EVENTS - RANCHO SECO
October 2, 1985

00:00:00 The reactor is at 31% power, 265 MWe. Unit load reduction in progress to perform turbine overspeed trip testing.

01:19:00 The reactor is at 20% power, 100 MWe.

Unit is swinging in both RCS and secondary side pressure due to feedwater oscillations. The turbine control is taken from operator auto to manual and control rod drive control (Diamond) is taken to manual to stabilize the plant.

"A" MFW pump is in hand and has been throughout power operation. "B" MFW pump is in hand also, but at minimum speed ~ 2400 rpm.

01:25:59 The reactor is at 14% power, 43 MWe.

OCBs 220 and 230 are opened, separating the generator from the grid.

The turbine bypass valves are controlling header pressure. RCS pressure is swinging. Pressurizer level is 220 - 230". T_{ave} is 584°F. The OTSGs are on low level limits (24"). The plant is unstable.

01:28:01 Computer alarm prints out "TG Low Vacuum Trip" (setpoint is 21" Hg).

Turbine bypass trips on low condenser vacuum. Turbine bypass valves close and steam pressure begins to increase to Atmospheric Dump Valve (ADV) setpoints.

Control room operators begin receiving reports of safety valves lifting on the turbine deck. An equipment attendant is sent to investigate.

Steam is reported blowing around MFW Pump "A".

Operators are sent to put both hogging air ejectors on to recover condenser vacuum.

The Senior Control Room Operator (SCRO) starts raising speed on MFW Pump "B" in preparation to take MFW Pump "A" off line.

Blowdown tank is reported to be overflowing.

ADVs start cycling to relieve steam pressure.

01:32:00 "A" MFW pump trips. Both AFW pumps automatically start on low main feedwater pump discharge pressure (< 850 psig).

01:32:25 The reactor trips on high pressure, 2300 psig. The turbine trips on reactor trip.

Operators perform immediate actions. (Manually trip reactor, manually trip turbine, reduce letdown flow to 40 gpm, and begin vital systems verification.)

01:32:30 "B" MFW pump trips.

01:32:35 AFW Bailey control valves open, initially feeding ~ 400 gpm to both OTSGs.

01:34:04 Pressurizer level is dropping quickly. The "A" HPI inject valve is manually opened (full). Flow is verified. The "B" HPI pump is manually started. "B", "C" and "D" HPI inject valves are manually opened full.

01:36:38 BWST suction valve SFV-25003 is opened and "A" HPI pump manually started.

Letdown is secured.

Approximately 180-200 gpm is flowing through each HPI inject line except "A"; it indicates 0 gpm. Operators pull the indicator out and put it back in but still get a 0 indication.

Pressurizer level decreases to 35" before turning around. Heaters manually start at 40" to maintain pressure. (Lowest RCS pressure reached is 1840 psig.)

The ICS is throttling AFW as 24" level control setpoint is approached.

01:37:10 T_{cold} (at 542°F) moves outside the post trip window on the Safety Parameter Display System (SPDS). This is the first positive indication to the operators that cooling is excessive.

01:40:52 "A" HPI pump is secured. HPI valves are throttled. Pressurizer level is recovering.

01:42:30 Pegging steam to 4th point heaters (PV-32453 and PV-32454) is closed (time estimated). Steam pressure rate of decrease is reduced. OTSG level increases due to resulting reduction in steaming rate.

01:43:40 T_{cold} at 500°F. RCS press ~ 2000 psig.

01:45:00 Condenser vacuum begins to recover due to the hogging air ejectors.

01:47:40 The RCS overcooling is stopped. Temperatures are stabilized at 491°F.

01:47:57 All HPI valves are closed. "B" HPI pump is secured. The plant is returned to normal makeup and letdown.

RCS at 491°F, ~ 2100 psig. Pressure level at ~ 120". OTSG pressure is about 600 psig and holding.

01:48:30 Slow, controlled RCS depressurization is started.

01:51:29 "C" Reactor Coolant Pump is secured (<500°F - core lift considerations).

01:55:26 "B" MFW pump has been reset and started. OTSG feed is swapped over from AFW to main feedwater. Both OTSGs are on low level limits with S/U valves in auto.

(When the "B" MFW pump is reset, the AFW/ICS control valves go closed. The operator observing decreasing OTSG levels transfers valve control to manual. The operator was not aware of this design feature of the ICS.)

02:15 AFW Pump P-318 is secured.

02:28 AFW Pump P-319 is secured.

03:30 RCS depressurization to 1400 psig is complete. A 3-hour soak is begun.

04:10 to 05:00 Condenser vacuum decreases again. Covers are placed on MSR relief valves and vacuum begins to recover.

SMUD
SACRAMENTO MUNICIPAL UTILITY DISTRICT □ 6201 S Street, P.O. Box 15830, Sacramento CA 95852-1830, (916) 452-3211
AN ELECTRIC SYSTEM SERVING THE HEART OF CALIFORNIA

RJR 85-530

October 31, 1985

J B MARTIN REGIONAL ADMINISTRATOR
REGION V OFFICE OF INSPECTION AND ENFORCEMENT
ATTENTION DOCUMENT CONTROL DESK
U S NUCLEAR REGULATORY COMMISSION
WASHINGTON DC 20555

DOCKET NO. 50-312
LICENSE NO. DPR-54
LICENSEE EVENT REPORT NUMBER 85-19

In accordance with the requirements of 10 CFR 50.73(a)(2)(iv) and 50.36(c)(1), the Sacramento Municipal Utility District hereby submits Licensee Event Report Number 85-19.

If there are any questions concerning this report, please contact Mr. Ron W. Colombo at the Rancho Seco Nuclear Generating Station Unit No. 1.

R. J. RODRIGUEZ
ASSISTANT GENERAL MANAGER
NUCLEAR

Attachment

cc: Region V (2)
INPO

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