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

AGM/NUC 91-005

January 17, 1991

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

Docket No. 50-312
Rancho Seco Nuclear Generating Station
License No. DPR-54
LICENSEE EVENT REPORT 90-03: EXCEEDING THE DESIGN BASIS OF THE PLANT DUE TO EXTREME LOW OUTSIDE TEMPERATURES.

Attention: Seymour Weiss

In accordance with the requirements of 10 CFR Part 50.73(a)(2)(ii)(B) the Sacramento Municipal Utility District hereby submits Licensee Event Report Number 90-03.

Members of your staff with questions requiring additional information or clarification may contact Robert Jones at (209) 333-2935, extension 4676.

Sincerely,

Dan R. Keuter
Assistant General Manager
Nuclear

Attachment

cc w/atch: J. B. Martin
C. Myers, NRC, Rancho Seco

IE22

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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): Rancho Seco Nuclear Generating Station

DOCKET NUMBER (2): 0 5 0 0 0 3 1 2

PAGE (3): 1 OF 0 4

TITLE (4): Exceeding the Design Basis of the Plant Due to Extreme Low Outside Temperatures

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)
1 2	2 7	9 0	9 0	- 0 0 3	- 0 0	1 1 7	9 1			0 5 0 0 0
										0 5 0 0 0

OPERATING MODE (9): N

POWER LEVEL (10): 0 0 0

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)

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, NRC Form 366A)
20.405(a)(1)(iii)	X 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	TELEPHONE NUMBER
Robert E. Jones, Licensing Engineer	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)

The minimum design temperature at Rancho Seco is 19°F (dry bulb). On December 22, 1990, from approximately 0300 hours to 0900 hours, the outdoor temperature at the site dropped below the 19°F design basis temperature to as low as 15°F. System walkdowns determined that, with the exception of Fire Suppression Zone 35A, all required plant systems were suitable for continued use and capable of fulfilling their function in the long-term defueled condition. Approximately 75 leaks were identified; however, the damage did not affect the ability of the affected systems to perform their intended function.

The District formed teams to conduct system walkdowns and document all signs of leakage or physical damage to pressure boundary parts. Damage is being corrected, as appropriate, using the work request process. In addition, a 2 gpm leak from the Radwaste System ran into a storm drain resulting in a minor offsite release of radioactive liquid.

As required by the Fire Protection Plan, the Shift Supervisor implemented compensatory measures for Fire Suppression Zone 35A.

Engineering evaluate the effects of the reduced temperatures to determine if additional physical work is required for affected plant systems.

The extreme low temperatures did not result in an unreviewed safety question. There were no health or safety consequences as a result of this event.

Description of the Event

Updated Safety Analysis Report (USAR), Appendix 2B "Meteorology" lists the historical minimum temperature in the area of Rancho Seco as 19°F. In addition, Nuclear Engineering Procedure NEP 5101.1 "Site Information" states that the minimum design temperature at Rancho Seco is 19°F (dry bulb).

On December 22, 1990, from approximately 0300 hours to 0900 hours, the outdoor temperature at the site dropped below 19°F to as low as 15°F. System walkdowns determined that, with the exception of Fire Suppression Zone 35A, all required plant systems were suitable for continued use and capable of fulfilling their function in the long-term defueled condition. Approximately 75 leaks were identified; however, the damage did not affect the ability of the affected systems to perform their intended function.

One leak resulted in a minor offsite release of radioactive water. A 2 gpm body to bonnet leak on Radwaste System valve lasted approximately 4 hours before being isolated. The leakage flowed through a drain in the north wall of the Tank Farm and into a storm drain located south-east of the east cooling tower. The leakage then travelled offsite to a field south of the plant.

Gamma spectroscopy and tritium analysis results showed radioactivity levels of 3.84E-2 uCi/ml H-3 and 3.59E-8 uCi/ml Cs-137. The total estimated release volume was 1.82E6 ml and the total whole-body dose (child) was 7.64E-4 mrem. This release, along with its associated contribution to offsite dose, will be discussed in the next semi-annual effluent report.

Additional leakage occurred on January 14, 1991, when a Service Water System (SWS) line in the Tank Farm broke after Operations returned the system to service after having previously isolated the system due to freeze damage. Although SWS is not a contaminated system, some leakage became contaminated (3.11E-8 Cs-137 and 9.05E-9 Co-60) when it collected in an area immediately adjacent to the Spent Fuel Pool cooler bermed area. This leakage subsequently soaked into the ground. Some water may have leaked into a sealed storm drain; however, Operations had diverted the storm drain to the retention basin, thus there was no abnormal offsite release of radioactive liquid.

Plant Operation Conditions

Rancho Seco has been shutdown since June 7, 1989, and has been defueled since the last of the fuel was removed on December 8, 1989.

Cause of the Event

The District established the minimum design temperature for Rancho Seco based on a review of historic meteorological data. The record setting low temperatures were an act of nature.

Energy Industry Identification System (EIIS) Component and System Identifier

The EIIS system identifier for Fire Protection is KP.

The EIIS system identifier for Spent Fuel Cooling is DA.

The EIIS system identifier for the Radwaste System is WD

Method of Discovery

Local weather reports and data from the National Weather Bureau indicated that temperatures in the Sacramento and Stockton area dropped below 19°F. Subsequent review of site meteorological data during the period from December 20, 1990, through December 27, 1990, indicated that the temperature dropped below 19°F for approximately 6 hours on December 22, 1990.

Safety Consequences

The District conducted an evaluation to determine if the abnormally low temperatures resulted in an unreviewed safety question. Given Rancho Seco's permanently defueled condition, the only credible design basis accidents are those associated with the loss of spent fuel pool water or with fuel handling.

Fuel handling equipment is located indoors and was not exposed to the extreme low temperatures. The spent fuel cooling system was operating, moving warm water through system piping, and was protected from the low temperatures. Other systems protecting spent fuel, including component cooling water and plant cooling water, were operating during the extreme cold weather, thereby sufficiently heating and protecting these systems. In addition, redundant systems remained operable/available, as required.

The extreme low temperatures did not result in an unreviewed safety question. There were no health or safety consequences as result of this event.

Corrective Actions

In accordance with 10 CFR 50.72(b)(1)(ii)(B), the Shift Supervisor initiated a one-hour telephone notification to the NRC.

The District formed teams to conduct walkdowns of those portions of required systems which were located outside and which contained water. The teams consisted of a senior systems engineer, a licensed operator, and an I&C or electrical technician, as appropriate. The teams documented all signs of leakage or physical damage to pressure boundary parts. Damage is being corrected as appropriate, using the work request process.

As required by the Fire Protection Plan, the Shift Supervisor implemented compensatory measures for Fire Suppression Zone 35A.

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

With the exception of SWS, all systems that were depressurized to repair leaks have been repressurized with no additional leaks identified. Operations will restore SWS to service in sections, with individuals observing the area being restored to ensure rapid detection and isolation of leaks.

Engineering will evaluate the effects of the reduced temperature to determine if additional physical work is required for affected plant systems.

Chemistry prepared an Abnormal Liquid Release Report and will discuss the abnormal liquid release in the next semi-annual effluent report.

Previous Similar Events

A review of previous LERs revealed that there were no previous occurrences where the ambient temperature fell below the design basis temperature.