Form 366

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 4

TITLE (4)
CORE DAMAGE ASSESSMENT USING RATIOS OF ISOTOPIC CONCENTRATIONS USES INCORRECT ASSUMPTIONS

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 0 0
0 9	2 4	8 6	8 6	0 2 0	0 0	1 1	2 6	8 6	NONE	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)	50.73(a)(2)(iv)	73.71(b)
POWER LEVEL (10)		20.405(a)(1)(i)	50.36(c)(1)	50.73(a)(2)(v)	73.71(c)
0 0 0		20.405(a)(1)(ii)	50.36(c)(2)	50.73(a)(2)(vii)	X 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)	VOLUNTARY
		20.405(a)(1)(v)	50.73(a)(2)(iii)	50.73(a)(2)(x)	

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER
	AREA CODE
RON W. COLOMBO, REGULATORY COMPLIANCE SUPERINTENDENT	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	
D			S 4 2 0	N							

SUPPLEMENTAL REPORT EXPECTED (14)		EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
YES (If yes, complete EXPECTED SUBMISSION DATE)	N NO				

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

The District is submitting a voluntary report concerning its AP.56 "Core Damage Assessment" procedure based, in part, on a document developed for Rancho Seco by Stone and Webster Corporation. The Stone and Webster document is titled "Technical Basis for Radioisotopic Determination of Extent of Core Damage Following a Loss of Coolant Accident" dated June 24, 1983. Using the procedure in the way it was written would possibly cause inappropriate decisions to be made to take inappropriate protective actions in the event of an actual core damage event. The procedure could estimate 90 percent core damage, while the actual condition was 10 percent core damage or vice versa. That type of error is not necessarily conservative. The District feels that similar procedures may have been supplied to other plants in the industry.

During updating of the procedure to Revision 2, on October 8, 1986, Section 3.10 which estimates core damage using ratios of isotopic concentrations, was deleted. A new section 3.4 was added which estimates core damage based on the containment area radiation monitor responses. This provides another independent method of estimating core damage even if the primary means, i.e., PASS data, is not available in a reasonable time frame after the event. The deleted part will be inserted back into the procedure after proper revision only if it provides correct results.

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FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
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TEXT (If more space is required, use additional NRC Form 366A's) (17)

The District is submitting a voluntary report concerning its AP.56 "Core Damage Assessment" procedure which was based, in part, on a document developed for Rancho Seco by Stone and Webster Corporation. The Stone and Webster document is titled "Technical Basis for Radioisotopic Determination of Extent of Core Damage Following a Loss of Coolant Accident" dated June 24, 1983. The Plant Review [Safety] Committee determined that this item is not reportable pursuant to 10 CFR Part 21; however, the District feels that similar procedures may have been supplied to other plants in the industry.

AP.56, "Core Damage Assessment" is written to provide a method for estimating the extent of core damage utilizing data obtained from the Post Accident Sampling System (PASS) and supported by other appropriate station indicators (e.g., containment high range monitors, in-core temperature monitors, containment hydrogen concentration). It serves as an informational procedure and does not perform a safety function.

Plant operating conditions before the event.

The plant has been in Cold Shutdown since the December 26, 1985 Loss of Integrated Control System incident. The plant never experienced a design basis LOCA or any other event involving core damage. Procedure AP.56 was first issued in 1983.

Dates and approximate times of occurrences.

The problem with the procedure was recorded on an internal Occurrence Description Report on September 24, 1986.

The [intermediate and root] cause[s] of each component or system failure or personnel error, if known.

Stone and Webster supplied a method for core damage assessment based on wrong assumptions (incorrect sources of radioactivity in the fuel pin gap) and methodology. The ratios of isotopes (e.g., Iodine-131 versus Iodine-134; Krypton-87 versus Xenon-87) is not well defined enough so that an accurate measurement of the isotopic concentrations cannot predict core damage.

The failure mode [undesirable state of a system or component], mechanism (i.e., immediate cause) and effect [the consequence or major concern resulting from the failure] of each failed component, if known.

Using the procedure in the way it was written would possibly cause inappropriate decisions to be made to take inappropriate protective actions in the event of an actual core damage event. The procedure could estimate 90 percent core damage, while the actual condition was 10 percent core damage or vice versa. That type of error is not necessarily conservative.

The Energy Industry Identification System component function identifier and system name of each component or system referred to in the LER.

The NRC LER System Vendor Code for Stone and Webster is S420.

The method of discovery of each component or system failure or procedural error. (testing, investigating, troubleshooting, tour, observation).

This problem was uncovered during a procedure review in preparation for the Emergency Drill held on October 8, 1986.

Operator actions that affected the course of the event, including operator errors, procedural deficiencies, or both, that contributed to the event [positive or negative contributions].

The plant is equipped with numerous types of safety related instruments whose outputs would conflict with faulty conclusions reached by the use of AP.56. However, a potential for confusion during an accident situation exists.

An assessment of the safety consequences and implications of the event [e.g., implication of the event if it occurred during other plant conditions, especially power operations - or why it could not have happened during power operations]. This includes the availability of other systems or components that can perform the same function as the components and systems that failed during the event [or why there were not any safety implications referring to the USAR analysis].

If a LOCA type accident occurred with possible core damage, the deficiency in the procedure could give misleading data on the extent of core damage. Therefore, it could have lead to improper actions in 1) mitigating the consequences of the accident; 2) in reducing the dose to the public, and; 3) controlling the release of radioactivity.

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

A description of any corrective actions planned as a result of the event, including those to reduce the probability of similar event occurring in the future.

During updating of the procedure to Revision 2, on October 8, 1986, Section 3.10 which estimates core damage using ratios of isotopic concentrations, was deleted. A new section 3.4 was added which estimates core damage based on the containment area radiation monitor responses. This provides another independent method of estimating core damage even if the primary means, i.e., PASS data, is not available in a reasonable time frame after the event. The deleted part will be inserted back into the procedure after proper revision only if it provides correct results.

Reference to any previous similar events at the same plant that are known to the licensee.

An LER similar to this LER was never written at Rancho Seco.

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

JEW 86-897

November 25, 1986

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

DOCKET NO. 50-312
LICENSE NO. DPR-54
LICENSEE EVENT REPORT NO. 86-20 VOLUNTARY REPORT ABOUT CORE DAMAGE ASSESSMENT USING RATIOS OF ISOTOPIC CONCENTRATIONS USES INCORRECT ASSUMPTIONS

In accordance with the requirements of 10 CFR 50.73(a)(2)(v), the Sacramento Municipal Utility District hereby submits Licensee Event Report Number 86-20.

If there are any questions concerning this report, please contact Mr. Ron W. Colombo at the Rancho Seco Nuclear Generating Station.

JOHN E. WARD
DEPUTY GENERAL MANAGER,
NUCLEAR

Attachment

cc: Region V (2)
INPO

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