NRC FORM 366 (4-95) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB NO. 3150-0104

EXPIRES 04/30/98

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS MANDATORY INFORMATION COLLECTION REQUEST: 50.0 HRS. REPORTED LESSONS LEARNED ARE INCORPORATED INTO THE LICENSING PROCESS AND FED BACK TO INDUSTRY. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (T-6 F33), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

LICENSEE EVENT REPORT (LER)

(See reverse for required number of digits/characters for each block)

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Millstone Nuclear Power Station Unit 2	05000336	1 OF 3

TITLE (4)

Technical Specification Containment Sump Trisodium Phosphate Volume Insufficient

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 NAME	DOCKET NUMBER
11	17	97	97	-- 036 --	00	12	17	97	FACILITY NAME	DOCKET NUMBER

OPERATING MODE (9)	N	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)					
POWER LEVEL (10)	000	20.2201(b)	20.2203(a)(2)(v)		50.73(a)(2)(i)		50.73(a)(2)(viii)
		20.2203(a)(1)	20.2203(a)(3)(i)	X	50.73(a)(2)(ii)		50.73(a)(2)(x)
		20.2203(a)(2)(i)	20.2203(a)(3)(ii)		50.73(a)(2)(iii)		73.71
		20.2203(a)(2)(ii)	20.2203(a)(4)		50.73(a)(2)(iv)		OTHER
		20.2203(a)(2)(iii)	50.36(c)(1)		50.73(a)(2)(v)		Specify in Abstract below in NRC Form 366A
		20.2203(a)(2)(iv)	50.36(c)(2)		50.73(a)(2)(vii)		

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER (Include Area Code)
R. G. Joshi, MP2 Regulatory Compliance Manager	(860) 440-2080

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 15 single-spaced typewritten lines) (16)

On November 17, 1997, during extended fuel cycle calculation review, it was identified that the amount of trisodium phosphate (TSP) specified in Technical Specification Surveillance Requirement 4.5.2.c.3 is not sufficient to meet the licensing basis requirement to increase the containment sump fluid pH to >/= 7.0. The original calculation had used minimum water volumes and boric acid concentrations. A revised calculation performed in 1977 assumed the maximum water volumes and boron concentrations, however, a simple ratio had been used to scale up the TSP required to neutralize higher concentrations of boric acid.

The cause of the condition was an incorrect assumption regarding the amount of TSP required to neutralize a known boric acid concentration.

A Technical Specification Change request to increase the minimum required Trisodium Phosphate volume to the proper value will be initiated. The resulting amendment will be implemented before entry into Mode 3 from the current outage.

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TEXT *(If more space is required, use additional copies of NRC Form 366A)* (17)

I. Description of Event

On November 17, 1997, during extended fuel cycle calculation review, it was identified that the amount of trisodium phosphate (TSP) specified in Surveillance Requirement 4.5.2.c.3 is not sufficient to meet the licensing basis requirement to increase the containment sump fluid pH to >/= 7.0. The maximum water volumes and boron concentrations for the Reactor Coolant System (RCS) [AC], Safety Injection Tanks (SIT) [BP], and Refueling Water Storage Tank (RWST) must be assumed for this calculation. At the time of discovery the plant was defueled.

In response to IE Bulletin 77-04, in November 1977, it was determined that the original calculation of the amount of TSP needed to neutralize the containment sump fluid assumed minimum water volumes and boron concentrations in the RCS, SIT and RWST. Therefore, the required amount of TSP was recalculated assuming maximum water volumes and boron concentrations for the RCS, SIT and RWST. This recalculation resulted in an increase in the minimum TSP requirement from 65 cubic feet to slightly less than 110 cubic feet. Accordingly, two additional 25 cubic foot baskets of TSP were installed in the sump with the three original baskets, for a total of 110 cubic feet. Also, Surveillance Requirement 4.5.2.c.3 was revised to specify 110 cubic feet of TSP (License Amendment 45, dated December 8, 1978).

The revised calculation determined the amount of TSP required assuming maximum boron concentrations of 2400 ppm for the RCS, SIT and RWST.However, the revised calculation determined the amount of TSP required to neutralize these boric acid concentrations based on a single data point of 700 ppm TSP to neutralize a 1720 ppm boron solution. The revised calculation incorrectly assumed the amount of TSP required to neutralize 2400 ppm boron solutions could be determined by multiplying 700 ppm TSP by the ratio 2400/1720.

This condition is being reported pursuant to 10 CFR 50.73(a)(2)(ii)(B), a condition that was outside the design basis of the plant.

II. Cause of Event

The cause of this condition was an incorrect assumption regarding the amount of TSP required to neutralize a known boric acid concentration.

III. Analysis of Event

TSP is dissolved from baskets on the sump floor by the recirculation of post-accident containment sump fluid. The function of the TSP is to raise the pH of the sump fluid to >/= 7.0 to minimize stress corrosion cracking of certain metal components in containment, including the containment liner. The pH of the recirculated containment sump fluid is also a design input to the Electrical Equipment Qualification Program for electrical equipment inside the containment.

A preliminary calculation based on the Millstone Unit 3 boric acid and TSP titration data indicates the present volume of 110 cubic feet of TSP in the Unit 2 sump would result in a worst-case final pH of about 6.6. The effect of the pH decrease from 7.0 to 6.6 on the corrosion of materials and equipment, and the proper functioning of electrical equipment in containment is expected to be insignificant.

In addition, the partitioning of iodine between liquid and gas phases in the post-accident containment environment is also controlled by the pH of the recirculated sump fluid. Research has shown that iodine absorption and

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retention by the recirculated fluid can be assumed so long as a fluid pH of greater than 7.0 is maintained. However, no credit is taken for this iodine partitioning in the Unit 2 design basis accident analyses.

Based on the above, this event is not safety significant.

IV. Corrective Action

As a result of this event, the following actions have been, or will be, performed.

A Technical Specification Change request to increase the minimum required Trisodium Phosphate volume to the proper value will be initiated. The resulting amendment will be implemented before entry into Mode 3 from the current outage.

V. Additional Information

Similar Events

No previous similar event involving the TSP neutralization of the containment sump fluid was identified.

Energy Industry Identification System (EIIS) codes are identified in the text as [XX].