NRC Form 366
(9-83)

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED OMB NO. 3150-0104
EXPIRES: 8/31/85

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Salem Generating Station - Unit No. 1	0 5 0 0 0 2 7 2	1 OF 0 5

TITLE (4) Unit No.1 Refueling Water Storage Boron Concentration Out Of Specification Due To Personnel Error

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 1	3 0	8 7	8 7	- 0 0 1	- 0 0	0 4	0 2	8 7		0 5 0 0 0
										0 5 0 0 0

OPERATING MODE (9)	1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)			
POWER LEVEL (10)	1 0 0	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
R. K. Heller - LER Coordinator	AREA CODE 6 0 9 3 3 9 - 4 3 0 9

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	
A											

SUPPLEMENTAL REPORT EXPECTED (14)		EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
X YES (If yes, complete EXPECTED SUBMISSION DATE)	NO		1 2	3 1	8 7

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

On March 9, 1987, during a periodic review of chemistry log book data, it was discovered that on January 30, 1987, the Boron concentration limit for the Refueling Water Storage Tank (RWST) had been exceeded. The specification listed in the Technical Specifications is 2000-2200 ppm. The value recorded from the sample result was 2205 ppm. The out of specification condition was not initially recognized, therefore, the Technical Specification Action Statement was not entered and no confirmatory sample was taken. The next sample was taken and analyzed on February 4, 1987, and the results were within specification. The "root cause" was determined to a lack of procedural control of the chemistry data forms and error on the part of the personnel reviewing the Technical Specifications. The chemistry log book data sheets were proceduralized and revised to reflect the current limits. A review of the out of specification analysis data revealed no errors. A review of RWST Boron concentration sample results from January 1986 to March 1987, revealed no other problems. This occurrence was reviewed with the Chemistry supervisor and the analyst. A memo was circulated and training was given to Chemistry Department personnel regarding this occurrence and use of the revised procedure.

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PLANT AND SYSTEM IDENTIFICATION:

Westinghouse - Pressurized Water Reactor

Energy Industry Identification System (EIIS) codes are identified in the text as {xx}

IDENTIFICATION OF OCCURRENCE:

UNIT NO. 1 REFUELING WATER STORAGE TANK BORON CONCENTRATION OUT OF SPECIFICATION DUE TO PERSONNEL ERROR

Event Date: 01/30/87

Report Date: 04/02/87

This report was initiated by Incident Report No. 87-088

CONDITIONS PRIOR TO OCCURRENCE:

Mode 1 Reactor Power 100% - Unit Load 1156 MWe

DESCRIPTION OF OCCURRENCE:

On March 9, 1987, during a periodic review of Chemistry Laboratory Log Book data, a value of 2200 ppm Boron was noted for the Unit No. 1 Refueling Water Storage Tank (RWST){BP}. The value for Technical Specification compliance indicated on the top of the log book data sheet was "greater than 2000 ppm". No upper limit was indicated. The reviewer believed that a Technical Specification change had been made to modify the limit to 2000-2200 ppm, therefore, an inquiry was made to determine if the specification indicated in the log book was correct. An investigation was conducted which included a review of RWST related Technical Specifications and previous RWST sample data. As a result of the investigation, it was determined that the Technical Specification limit for Boron concentration is 2000-2200 ppm, and that on one occasion, January 30, 1987, this limit was apparently exceeded.

On January 30, 1987, at 1745 hours, the Unit No. 1 Refueling Water Storage Tank was sampled. The sample results indicated a Boron concentration of 2205 ppm, 5 ppm greater than the 2200 ppm allowed by the Technical Specifications. The Boron concentration was not recognized as being out of specification. Therefore, no confirming sample was taken and Limiting Condition for Operation Action Statement 3.1.2.8.b, was not entered. The next Boron concentration sample and analysis was performed on February 4, 1987. The results of that sample indicated a concentration of 2175 ppm, well within the specified limits.

APPARENT CAUSE OF OCCURRENCE:

The "root cause" of the occurrence was determined to be a lack of procedural control of the chemistry data forms and inadequate review of the Technical Specification amendment due to personnel error. When the Technical Specification value was modified, the reviewing personnel did not ensure the new values were incorporated in the chemistry log book data sheets. A review of the program for incorporation of Technical Specification changes indicates that this was an isolated occurrence due to personnel error and not a program deficiency.

Because the data sheets were not part of a procedure, they did not receive periodic review and updating. The result is that the value the analyst used in making a decision as to whether or not the RWST Boron concentration was in specification, was incorrect.

ANALYSIS OF OCCURRENCE:

Since no confirming sample was taken, it must be assumed that the actual Boron concentration was in fact greater than allowable until the next sample was taken.

The Boron concentration limits for the RWST are established to ensure sufficient Boron concentration is available in the Reactor Coolant System (RCS) and containment to ensure the Reactor remains subcritical following an accident and maintain a pH value greater than 7.0. The expected sump pH is between 8.5 and 11.0 for solution recirculated within the containment following a LOCA. This pH band minimizes the release of Iodine and the effect of chloride and caustic corrosion on mechanical systems and components.

A statistical analysis of RWST Boron analytical results was made from January 3, 1987 to March 6, 1987. The RWST was sampled and analyzed for Boron 19 times during this period. The mean (or average) value was 2184 ppm Boron. The standard deviation around the mean was 11.84 ppm Boron. This means that if the true value of the Boron concentration was 2184 ppm, 68% of the sample results would be expected to fall between 2172 and 2195 ppm, and 95% of the sample results would be expected to fall between 2159 and 2207 ppm. This is due to the uncertainty in the sampling and analytical measurement methods. Based on statistical analysis of the data, there was no significant change in the Boron concentration during the period. The nominal Boron concentration was 2184 ppm, which is within the Technical Specification limits of 2000-2200 ppm.

The calculated time for transfer to hot leg recirculation of 22.5 hours is based on an initial concentration of 2200 ppm. The time is established to ensure the Boron concentration in the core does not exceed 23 weight percent, which is 4 weight percent below the solubility for boron at 212 degrees Fahrenheit.

ANALYSIS OF OCCURRENCE: (cont'd)

In the event of a LOCA, sufficient Boron would have been in solution to ensure the Reactor remained subcritical following the accident and maintain a pH value between 8.5 and 11.0 for the solution recirculated within the containment.

Therefore, this occurrence involved no undue risk to the health or safety of the public. However, since the out of specification value was obtained and the Technical Specification Action Statement was not entered, this event is reportable in accordance with the requirements of the Code of Federal Regulations 10CFR50.73 (a)(2)(i)(B).

CORRECTIVE ACTION:

The laboratory log book data sheets with the incorrect Technical Specification limit of greater than 2000 ppm Boron were discarded and replaced with new data sheets with the correct value of 2000-2200 ppm Boron. A review was made of the titration data and calculations generated by the analyst in performing the analysis that exceeded the Technical Specification limits. No errors were found.

A review of the RWST Boron results was made for the period of January 1986 to March 1987. No other results were found to be outside the Technical Specifications limits without the appropriate actions being taken. A statistical analysis of the Boron sample values was made with the conclusion that the Boron concentrations were in specification.

In order to prevent a recurrence, all Technical Specification related laboratory log book data sheets were proceduralized so that the values would undergo a periodic review for accuracy. Technical Specification limits and control limits were put on laboratory log book data sheets and laboratory data daily summary forms. The control limits were established to minimize the chances of obtaining a value outside the Technical Specification limit. Including the Technical Specification values on the laboratory daily summary forms provides a redundant means for the analyst and reviewers to detect an out of specification condition.

A notation has been made to the laboratory log book data forms requiring them to remain in the log books for an additional ten (10) days beyond the end of the month to provide an enhanced review of the laboratory data.

The implications of this occurrence were reviewed with the supervisor responsible for reviewing the chemistry data logs and the analyst responsible for the sample. A memo from the Chemistry Engineer, regarding this occurrence and the use of the revised procedure, was circulated to all Chemistry Department personnel. Additionally, training was conducted for Chemistry Department personnel regarding the use of the revised procedure.

CORRECTIVE ACTION: (cont'd)

This report will be reviewed by the Nuclear Training Center for possible incorporation into existing or future Chemistry training programs.

General Manager -
Salem Operations

RKH:pc

SORC Mtg. 87-024

PSE&G

Public Service Electric and Gas Company P.O. Box E Hancocks Bridge, New Jersey 08038

Salem Generating Station

April 7, 1987

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

Dear Sir:

SALEM GENERATING STATION
LICENSE NO. DPR-70
DOCKET NO. 50-272
UNIT NO. 1
LICENSEE EVENT REPORT 87-001-00

This Licensee Event Report is being submitted pursuant to the requirements of 10CFR 50.73(a)(2)(i)(B). This report is required within thirty (30) days of discovery.

Sincerely yours,

J. M. Zupko, Jr.
General Manager-
Salem Operations

MJP:pc

Distribution

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