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

LICENSEE EVENT REPORT (LER)

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

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.

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
SALEM GENERATING STATION, UNIT 1	05000272	1 OF 5

TITLE (4)
Failure To Perform Radioactive Effluent Concentration Surveillance And Effluent Monitoring Instrument Channel Setpoint Determinations In Accordance With Technical Specifications

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
03	02	98	98	-- 004 --	00	04	01	98	Salem Unit 2	05000311
									FACILITY NAME	DOCKET NUMBER

OPERATING MODE (9)	4	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)	X 50.73(a)(2)(i)	50.73(a)(2)(viii)
		20.2203(a)(1)	20.2203(a)(3)(i)	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 or 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)
Brooke Knieriem, Licensing Engineer	(609) 339-1782

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).	NO				

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)

This LER documents the failure of Salem Units 1 and 2 to comply with the requirements of Technical Specifications (TS) 4.11.1.1.2, Radioactive Effluents, and TS 3.3.3.8, Radioactive Liquid Effluent Monitoring and Instrumentation. TS 4.11.1.1.2 requires that the results of radioactivity analyses be used in accordance with the Offsite Dose Calculation Manual (ODCM) to assure that the release concentrations are maintained within TS limits. Salem TS 3.3.3.8 requires that radioactive effluent monitoring instrumentation channel alarm and trip setpoints be determined in accordance with the ODCM.

Contrary to these requirements, release rate calculations and radioactive effluent monitoring channel setpoints were identified that employed a Safety Factor different from that specified by the ODCM. This event is reportable under 10CFR50.73(a)(2)(i)(B), any operation or condition prohibited by the plant's TS. Although instances were identified in which the Safety Factor used was less conservative than the Safety Factor in the ODCM, no instances were identified in which TS concentration limits for release were exceeded.

The apparent cause of this event was an organizational deficiency in the implementation of the Radioactive Effluents/ODCM program. A contributing factor was a lack of understanding by station personnel of the role of the ODCM in the licensing basis. Corrective actions were taken to correctly document the Safety Factor in the ODCM and to correct Safety Factor discrepancies between the ODCM, the implementing procedure, and the Radioactive Effluents TS (RETS) software. Other corrective actions will be taken to address programmatic and personnel issues identified as a result of this event.

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
SALEM UNIT 1	05000272	98	- 004 -	00	2 OF 5

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

PLANT AND SYSTEM IDENTIFICATION

Westinghouse - Pressurized Water Reactor

Liquid Waste System (LWS) {WD/-}*
Chemical and Volume Control System (CVCS) {CB/-}*

* Energy Industry Identification System (EIIS) codes and component function identifier codes appear as {SS/CCC}.

CONDITIONS PRIOR TO OCCURRENCE

At the time of occurrence, Salem Unit 1 was in Mode 4 (Hot Shutdown) and Unit 2 was in Mode 5 (Cold Shutdown).

DESCRIPTION OF OCCURRENCE

During a root cause investigation of a related event that occurred on February 24, 1998, violations of Salem TS 4.11.1.1.2, Radioactive Effluents, and TS 3.3.3.8, Radioactive Liquid Effluent Monitoring And Instrumentation, were identified. These violations first occurred on January 3, 1996, when the Offsite Dose Calculation Manual (ODCM) was revised by Revision 10 to add a Safety Factor to the radioactive effluent calculation used to determine radioactive liquid effluent monitor setpoints and release rates. The Safety Factor was added to account for non-gamma emitting radionuclides that cannot be detected by installed radiation monitoring equipment.

Prior to this revision, the ODCM did not use a Safety Factor in these calculations. However, a Safety Factor was used by the implementing procedure SC.CH-TI.ZZ-0140(Q), Radiological Liquid Effluent Discharges, and in the RETS software used to perform the calculations. This did not constitute a violation of the TS requirement to perform these calculations in accordance with the ODCM because the calculation methodology in the procedure and in the RETS software used the ODCM methodology, but added its own Safety Factor for additional conservatism.

At the time the revision to the ODCM was implemented, station personnel did not recognize that the Safety Factor used in the RETS effluent software, the radioactive effluent implementing procedures, and to determine the radioactive liquid effluent monitoring instrumentation setpoints, did not agree with the ODCM. Station personnel also did not recognize the impact of that condition on the licensing basis. Specifically the requirement of TS 4.11.1.1.2 to use the results of radioactivity analyses in accordance with the ODCM to assure that release concentrations are maintained within TS limits; and the requirement of TS 3.3.3.8 to determine radioactive effluent monitoring instrumentation channel alarm setpoints in accordance with the ODCM was not recognized.

From the time that ODCM Revision 10 was implemented on January 3, 1996, until the Safety Factors in the ODCM, the procedure, and the software were brought into agreement on October 23, 1997, surveillances performed to satisfy TS 4.11.1.1.2 were not performed in accordance with the ODCM and therefore constituted violations of TS. Additionally, during that time period, radioactive effluent monitoring instrumentation channel alarm setpoints were not set accordance with the ODCM, constituting a violation of TS 3.3.3.8.

During the implementation of ODCM Revision 10, the Safety Factor itself was incorrectly documented in the ODCM. The error in the ODCM revision communicated the Safety Factor as [.25] vice [1-.25 or .75] and resulted in multiplying release rate and setpoint by [.25]

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
SALEM UNIT 1	05000272	98	- 004 -	00	3 OF 5

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

DESCRIPTION OF OCCURRENCE (Cont.)

instead of [.75]. Since the link between the the ODCM and the TS was not recognized, the effect of this error was not immediately felt. The error was first identified on September 9, 1996, by a controls engineer. This engineer determined that the conservative Safety Factor would likely result in numerous Control Room alarms because radiation monitor setpoints would be set to 25% of their previous values.

Based upon discussions with the author of ODCM Revision 10, the controls engineer determined that the intent of the revision was to use a Safety Factor with a value of [.75] and not [.25]. The controls engineer then used the "intended" value [.75] for Safety Factor and not the actual value of [.25] for setpoint determination. Again, the controls engineer did not recognize the link between the ODCM and the TS. Because the setpoints were changed to a value derived using the "intended" and not the actual Safety Factor value of the revision to the ODCM, the setpoints remained in a state of non-compliance with TS 3.3.3.8 until this discrepancy was corrected on March 14, 1998.

When apprised of the Safety Factor error, the author of Revision 10 incorrectly concluded that the design engineers were using the Safety Factor outside of its intended purpose, that it was derived from radioactive liquid waste data, and that it was not intended for use with other radioactive waste monitors. This demonstrated a clear lack of understanding that TS 3.3.3.8 encompasses all radioactive liquid effluent monitoring instrumentation and is not restricted to liquid waste effluent monitors. From that point on, the author of the ODCM revision considered that this issue was restricted to the incorrectly documented Safety Factor in the ODCM and did not recognize that a condition adverse to quality existed. Although identified, the Safety Factor documentation error in the ODCM was not corrected at that time.

On September 19, 1997, a Quality Assurance audit identified the Safety Factor discrepancy between the ODCM, the procedure, and the RETS software. However, the audit failed to recognize the relationship between the TS and the ODCM, or to identify that the station was not in compliance with TS.

As a result of this audit, the RETS software was modified on September 19, 1997, to obtain agreement with the ODCM. In error the Safety Factor was changed to [.75] and not [.25] as documented in the ODCM. The Safety Factor in procedure SC.CH-TI.ZZ-0140(Q) was revised on September 23, to a value of [.25] to conform to the ODCM Safety Factor. The error in the Safety Factor in the RETS software was identified and was again changed in October 23, from [.75] to [.25] to conform with the ODCM. At that time the procedure and the RETS software were both in compliance with the Safety Factor in the ODCM. From that point forward, surveillances performed to satisfy TS 4.11.1.1.2 using the RETS software and procedure SC.CH-TI.ZZ-0140(Q) would comply with TS, but with an unneccesarily conservative Safety Factor. Radioactive liquid effluent monitor setpoints remained at values calculated using the [.75] Safety Factor.

On January 3, 1998, during the preparation of two radioactive liquid release permits, Chemistry Department personnel altered the permits by changing the Safety Factor used by the RETS software from [.25] to [1]. The Safety Factor was changed to remove a quarterly dose projection "flag" that was generated by the RETS software. The "flag" alerts Chemistry Department personnel when additional processing of the effluent is necessary prior to release to ensure that the dose limit is not exceeded. The Safety Factor was changed as a work-around by the Chemistry Department personnel who recognized that the flag was caused by the overly conservative Safety Factor of [.25] used by the software. Because the ODCM does not require the use of a Safety Factor in the dose calculation required by TS 4.11.1.3, this calculation was correctly performed to ensure that dose limits of TS 3.11.1.3 and 10CFR20 were not exceeded.

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
SALEM UNIT 1	05000272	98	- 004 -	00	4 OF 5

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

DESCRIPTION OF OCCURRENCE (Cont.)

The RETS software used the same formula to calculate the release rate. Because the release rate calculation in the ODCM (since the implementation of Revision 10) required the use of a [.25] Safety Factor, TS 4.11.1.1.2 was violated when the Safety Factor was changed to [1]. A subsequent review of these releases demonstrated that the concentration limits of TS 3.11.1.1 were not exceeded.

On March 14, 1998, ODCM revision 11 was approved which incorporated the [.75] Safety Factor into the setpoint calculation. This brought the Safety Factor used to calculate release rate and radioactive liquid effluent monitor setpoints in the procedure, the RETS software, and the ODCM into agreement. Additionally, this action brought Radioactive Liquid Effulent Monitor setpoints into alignment with the ODCM and TS 3.3.3.8 was satisfied.

CAUSE OF OCCURRENCE

The apparent cause of this event is an organizational deficiency in the implementation of the Radioactive Effluents/ODCM program as evidenced by inadequate program monitoring and management as well as a lack of program evaluation.

Contributing to this occurrence was an overall lack of understanding by station personnel of the role of the ODCM in the station's licensing basis.

PRIOR SIMILAR OCCURRENCES

A review of LERs for Salem Units 1 and 2 issued in the last two years identified one LER that discussed a related occurrence. LER 272/97-007-00 reported a violation to TS 3.3.3.8, Radioactive Liquid Effluent Monitoring Instrumentation. This violation was caused by the failure of station personnel to independently verify the radioactive liquid waste release valve lineup as a compensatory measure required by TS when the radioactive liquid effluent monitoring instrumentation is out of service.

SAFETY CONSEQUENCES

There were no safety consequences as a result of this event. A review of the releases performed between the implementation of Revision 10 to the ODCM on January 3, 1996, and the time that the discrepancy between the ODCM, the RETS software, and the procedure were corrected on October 23, 1997; and a review of the releases on January 3, 1998, revealed that in no case were the concentration limits of TS 3.11.1.1 exceeded.

Additionally, although Effluent Radiation Monitor setpoints were not set in accordance with the ODCM as required by TS, at no time were the setpoints set to a value that would have permitted the concentration limits of TS 3.11.1.1 to be exceeded for batch or continuous release.

CORRECTIVE ACTIONS

1. The releases performed between the implementation of Revision 10 to the ODCM on January 3, 1996, and the time that the discrepancy between the ODCM, the RETS software, and the procedure was corrected on October 23, 1997; and the releases on January 3, 1998 were reviewed to verify that the concentration limits of TS 3.11.1.1 were not exceeded.

2. On March 14, 1998, the Safety Factor was corrected in the ODCM by implementation of Revision 11. Additionally, the implementing procedure and RETS software were revised to align with this change.

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
SALEM UNIT 1	05000272	98	- 004 -	00	5 OF 5

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

CORRECTIVE ACTIONS (Cont.)

3. Radioactive liquid effluent monitors were declared inoperable because of the incorrect Safety Factor applied to their setpoint. Following implementation of ODCM revision 11, the setpoints were restored to compliance with the ODCM.

4. Appropriate personnel involved with the errors have been held accountable in accordance with PSE&G's procedures and policies.

5. Improvements to ODCM effluents program controls and review process will be implemented to ensure that adequate interface exists between design engineering, effluents software, radiation monitor set points, and the implementing procedures. (00980224081, CRCA 12, to be completed by 6/15/98)

6. Training will be provided to appropriate personnel on the effluents program and its licensing basis. (00980224081, CRCA 04, to be completed by 6/15/98, CRCA 29, to be completed by 9/30/98.)

7. An independent review of the ODCM will be performed to ensure that it is consistent with available regulatory guidance. (00980224081, CRCA 17,to be completed by 7/15/98)

8. Ownership for the ODCM has been formally defined and assigned.