

MAY 01 2003

LR-N03-0136



United States Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

**RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION REGARDING
CHANGE TO TECHNICAL SPECIFICATION RELATING TO CONTAINMENT
CLOSURE AND FUEL HANDLING VENTILATION
SALEM GENERATING STATION UNIT NOS. 1 AND 2
FACILITY OPERATING LICENSE NOS. DPR-70 AND DPR-75
DOCKET NOS. 50-272 AND 50-311**

By letter dated July 29, 2002, PSEG Nuclear submitted a request for a revision to Technical Specifications associated with containment closure and Fuel Handling Area ventilation requirements at the Salem Nuclear Generating Station, Units 1 and 2. On March 18, 2003, the NRC issued a request for additional information (RAI) concerning PSEG Nuclear's request, which is necessary in order to complete their evaluation. Attachment 1 provides the responses to the NRC's request.

The analyses performed in support of this license change request were to determine the Exclusion Area Boundary (EAB), Low Population Zone (LPZ) and Control Room (CR) doses due to a fuel handling accident (FHA) occurring in the containment building and in the Fuel Handling Building (FHB). The FHA analyses were performed using a selective implementation of an alternative Accident Source Term (AST), guidance in Regulatory Guide 1.183, Appendix B, and TEDE dose criteria.

Additional conservatism was used by assuming no containment closure during fuel movement and all the resulting radiation escapes via the open equipment hatch within 2 hours following the FHA. As described in the amendment request, the administrative controls provide reasonable assurance that containment hatch closure, as a defense-in-depth measure, can be reestablished quickly to limit releases to a lower level than assumed in the dose calculation.

Fuel handling accidents are postulated in the containment and FHB with the reactor being subcritical for at least 96 hours. Conservative assumptions are used in that activity is released to the environment through the opened Containment Equipment Hatch (CEH) or the plant vent (PV) with no credit taken for any filtration. The term "sufficiently irradiated fuel assemblies", as approved for use in the Standard Technical Specifications, was not used in developing the amendment request in an effort to maintain a conservative approach to this application of a new source term. TS Section 3.9.3 requires the fuel to be subcritical for at least 100 hours prior to movement.

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A comparison of Post-FHA Dose (rem TEDE) is provided in Table 2 included in the response to Question 1. This comparison illustrates the effects to EAB and LPZ doses with and without crediting the Fuel Handling Building charcoal filters. When compared to the TEDE dose criteria of AST, the EAB dose is less than 10% of the limit and LPZ dose is less than 1% of the limit.

PSEG believes that the requested amendment represents a conservative approach to the selective application of Alternative Source Term in accordance with 10 CFR 50.67 and RG 1.183.

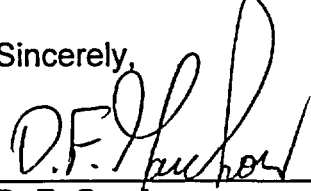
Attachment 2 provides corrections to three of the marked up pages contained in the July 29, 2002 submittal. Please replace those mark ups with the ones attached. These corrections do not impact the justification provided nor do they impact the No Significant Hazards determination.

If you have any questions concerning this submittal, please contact Brian Thomas at 856-339-2022.

I declare under penalty of perjury that the foregoing is true and correct.

Sincerely,

Executed on 5/1/03



D. F. Garchow
Vice President-Projects and Licensing

Attachments (2)

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**SALEM GENERATING STATION
UNIT NOS. 1 AND 2
FACILITY OPERATING LICENSE DPR-70 AND DPR-75
DOCKET NOS. 50-272 AND 50-311
RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION
CONTAINMENT CLOSURE AND FUEL HANDLING AREA VENTILATION**

On March 18, 2003, the NRC issued a request for additional information (RAI) concerning PSEG Nuclear's request for amendment to revise the containment closure and Fuel Handling Area ventilation requirements for Salem Unit Nos. 1 and 2.

NRC Question 1:

As a result of the adoption of the alternate source term (AST), some licensees are requesting that certain requirements, including ventilation systems no longer credited in the accident dose analysis, be removed from TSs. After a careful review of some of these requests, the staff concluded that certain requests may be granted provided that other applicable regulations and requirements continue to be met. These regulations may include, where applicable, Title 10 of the Code of Federal Regulations (10 CFR) Section 50.36, General Design Criterion (GDC) 61, GDC 64, and rules on ALARA. Other requirements would include: (1) following the principles of risk-informed regulations, (2) maintaining defense-in-depth and existing safety margins, (3) ensuring that increases in risk do not result in violation of CDF/LERF goals, and (4) performance based implementation and monitoring address uncertainties and include corrective actions.

Accordingly, because PSEG is requesting to remove or downgrade ventilation systems required by TSs by adopting AST, the licensee needs to address, in writing, how 10 CFR 50.34a; 10 CFR 50.36, Criterion 2; and GDCs 61, 63, and 64 continue to be met as a result of the requested change.

PSEG Response to Question 1:

10CFR50.34a, "Design objectives for equipment to control releases of radioactive material in effluents – nuclear power reactors," provides the NRC design objectives for systems used to control radioactive gaseous and liquid effluents to ensure that release of radioactive material to unrestricted areas is maintained as low as is reasonably achievable. 10CFR50 Appendix I provides the numerical guidelines for meeting 10CFR50.34a.

The Fuel Handling Building Ventilation (FHV) system charcoal filter is a standby filter that is placed in service when radioactivity levels within the Fuel Handling Building become excessive. Salem Technical Specifications 3/4.9.12 provide restrictions on the operation of the FHV system when irradiated fuel is being moved in the Fuel Handling Building. As stated in the TS Bases for the FHV system, the purpose of TS 3/4.9.12 is

to ensure that the HEPA/Charcoal filter train is operable whenever a fuel handling accident (FHA) is possible. This restriction in TS 3/4.9.12 to maintain the HEPA/Charcoal filter train operable during movement of irradiated fuel assemblies was based on the requirement from the original TID dose analysis for the FHA. This dose analysis required the HEPA/Charcoal filtration train to be in-service during the accident to meet the dose limits of 10CFR100 and General Design Criteria (GDC) 19. In Amendment 251 (Unit 1) and Amendment 232 (Unit 2), the NRC approved a new dose analysis for the Salem Fuel Handling Accident using an alternate source term (AST). The AST dose analysis was performed with no reliance on the FHV HEPA/Charcoal filtration train. Since the dose analysis no longer relies on the HEPA/Charcoal filter train to mitigate a FHA, maintaining the requirements in TS 3/4.9.12 for the FHV HEPA and charcoal filters is no longer necessary and no longer required by 10CFR50.36.

Although the proposed changes to the TS are deleting the requirements to perform surveillance testing on the HEPA and charcoal filter, PSEG is not removing these components from the FHV based on this change. Since the HEPA/Charcoal filter train is not being removed, there is no impact to the 10CFR50 Appendix I (10CFR50.34a) evaluation for Salem. Any modification to the FHV to remove the HEPA/Charcoal filter at a later time will be evaluated under 10CFR50.59, which will include a review of the 10CFR50 Appendix I analysis. The current UFSAR for Salem states that the charcoal filter train is normally at standby and is inspected and tested periodically for availability, especially prior to refueling. This administrative control will assure the preparedness of the filter train and clogging of the train during the relatively short period of refueling or during a fuel handling accident is not anticipated.

PSEG will maintain these UFSAR requirements after the issuance of this amendment and any subsequent changes will be evaluated under the requirements of 10CFR 50.59.

Salem Station was designed to comply with PSEG's understanding of the intent of the Atomic Energy Commission's (AEC) proposed General Design Criteria, as published for comment by the AEC in July 1967.

Table 1

10CFR50 Appendix A GDC	AEC July 1967 Proposed GDC
Criterion 61	Criterion 69 & 70
Criterion 63	Criterion 18
Criterion 64	Criterion 17

The above table provides the relationship between the AEC proposed GDC and the 10CFR50 Appendix A GDC identified in the NRC's question.

The changes proposed in the License Amendment Request associated with the FHV System continue to meet Criterion 17, 18, 69 and 70 of the AEC July 1967 proposed GDC as discussed in section 3.1.2 of the Salem UFSAR.

Criterion 17 discusses the monitoring of radioactivity releases which is unchanged by the elimination of the surveillance requirements for the FHV HEPA/Charcoal filtration train. Releases from the Fuel Handling Building will continue to be monitored by the plant vent radiation monitor.

Criterion 18 discusses monitoring fuel and waste storage such that monitoring and alarm instrumentation shall be provided for fuel and waste storage and handling areas for conditions that might contribute to loss of continuity in decay heat removal and to radiation exposure. This change to eliminate the surveillance testing of the FHV HEPA/Charcoal filtration train does not alter the monitoring and alarm instrumentation.

Criterion 69 discusses protection against radioactivity release from spent fuel and waste storage in that containment of fuel and waste storage shall be provided if accidents could lead to release of undue amounts of radioactivity to the public environs. Criterion 70 discusses the control of releases of radioactivity to the environment. The design for radioactivity control shall be justified (a) on the basis of 10CFR20 requirements for normal operations and for any transient situation that might reasonably be anticipated to occur and (b) on the basis of 10CFR100 dosage level guidelines for potential reactor accidents of exceedingly low probability of occurrence. Elimination of the surveillance requirements for the FHV HEPA/Charcoal filtration train does not alter Salem stations ability to meet Criterion 69 and 70 as described in the UFSAR. Radioactivity from the spent fuel will continue to be contained in the fuel handling building. Although the surveillance requirements for the HEPA/Charcoal filter are being eliminated, the standby HEPA/Charcoal filters are not being removed from the system and will still be capable of reducing radioactivity in the normal effluents in the event that radioactivity levels increase in the fuel handling building. Should PSEG choose to remove the FHV HEPA/Charcoal filtration train at a later time, it would be evaluated under 10CFR50.59.

During a FHA, the dose analysis utilizing AST has demonstrated that the dose limits of 10CFR50.67 and Regulatory Guide 1.183 are met without crediting the FHV HEPA/Charcoal filter. Although the surveillance requirements are being eliminated for the FHV HEPA/Charcoal filtration train, the equipment is not being removed at this time and could be placed in service by the operators to further reduce any radioactivity release from a FHA. The effect of removing credit for the Fuel Handling Building Ventilation System Charcoal on the off-site doses is shown in the following table. For the Fuel Handling Accident (FHA) in the Fuel Handling Building (FHB), off-site doses are shown in the current licensing basis and compared with the off-site doses taking credit for the charcoal (that is, 90% efficiency and 25% bypass).

Table 2

Post-FHA Activity Release	Post-FHA Dose (rem TEDE)	
	Receptor Location	
	EAB	LPZ
Current licensing basis analysis results without crediting FHB charcoal	0.415	0.0593
Analysis results with FHB charcoal credit	0.163	0.0233
Dose criteria	6.3	6.3

As shown in the table above, the EAB dose with no credit taken for charcoal filtration is less than 10% of the dose limit. The LPZ dose with no credit taken for charcoal filtration is less than 1% of the dose limit.

NRC Question 2:

According to the submittal, the containment purge system and the auxiliary building ventilation systems can draw a negative pressure on the containment with the equipment hatch open. Describe the analyses that were performed to verify that these systems can draw down the containment with the equipment hatch open.

PSEG Response to Question 2:

The ability to draw a negative pressure on the containment was based on past operating experience. As an example, during the Unit 2 12th refueling outage high airborne activity in the containment caused an automatic isolation of the containment purge system, which isolated the ventilation flowpath in and out of containment. To reduce the airborne activity in containment, the personnel airlocks and the refueling outage equipment door were opened with the Auxiliary Building Ventilation System (ABVS) in service to allow the ABVS to draw the air out of containment and reduce the containment airborne activity. As shown in Figure 1 and Table 3, the containment airborne activity level decreased which demonstrated the ability of the ABVS to draw the air from the containment with the personnel airlocks open. The exhaust from the ABVS is monitored by the plant vent radiation monitors.

The Salem ABVS design includes the required line-ups to purge the containment. The ABVS supply fans provide the purge supply air into the containment and the ABVS exhaust fans draw the purge exhaust out of containment. The use of the containment purge flow path or, the personnel airlocks with the ABVS in service and the equipment hatch open will allow the ability to monitor the release following the FHA until containment closure can be accomplished.

Fuel handling accidents are postulated in the containment and FHB with the reactor being subcritical for at least 96 hours. Conservative assumptions are used in that; activity is released to the environment through the opened Containment Equipment Hatch (CEH) or the plant vent (PV) with no credit taken for any filtration. The term "sufficiently irradiated fuel assemblies", as approved for use in the Standard Technical Specifications, was not used in developing the amendment request in an effort to maintain a conservative approach to this application of a new source term. TS Section 3.9.3 requires the fuel to be subcritical for at least 100 hours prior to movement.

Additional conservatism was used by assuming no containment closure during fuel movement and all the resulting radiation escapes via the open equipment hatch within the first 2 hours subsequent to the FHA with no credit taken for any filtration. These additional conservative assumptions are used for this amendment request to relax the containment closure requirements during fuel movement. The administrative controls provide reasonable assurance that containment hatch closure as a defense-in-depth measure can be reestablished quickly to limit releases to a lower level than assumed in the dose calculation.

The data provided in Figure 1 and corresponding Table 3 supports the justification for the statements made in the PSEG submittal.

Figure 1

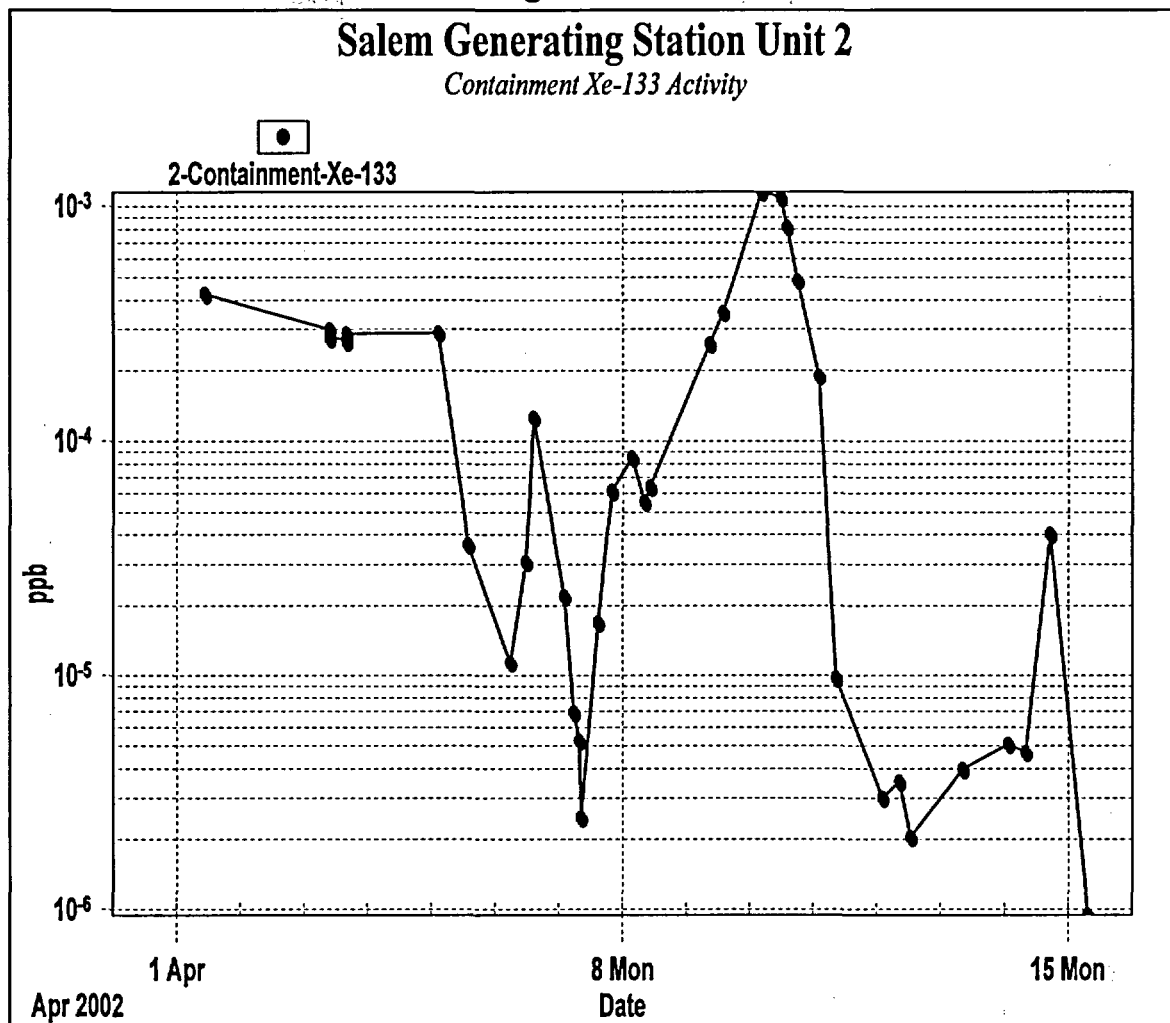


Table 3

Date	Xe-133	On-Going Activity
04/09/2002 08:51	2.601E-04	RCS Drained to Mid-Loop
04/09/2002 13:50	3.545E-04	Containment Purge Isolated
04/10/2002 04:25	1.150E-03	
04/10/2002 11:40	1.089E-03	
04/10/2002 14:04	8.174E-04	Containment purge via Auxiliary Building Ventilation
04/10/2002 18:05	4.842E-04	
04/11/2002 02:05	1.893E-04	
04/11/2002 02:05	1.880E-04	
04/11/2002 08:35	9.733E-06	
04/12/2002 02:05	3.009E-06	
04/12/2002 08:30	3.527E-06	
04/12/2002 12:43	2.044E-06	

NRC Question 3:

If the Fuel Handling Area Ventilation system is not operating when moving loads over the spent fuel pool, how will radiological releases due to a dropped load be monitored?

PSEG Response to Question 3:

In paragraph g. of page 2 of the July 29, 2002 submittal, it describes the deletion of moving loads over the spent fuel pool from TS 3/4 3.9.12. As described in FHA analysis in the UFSAR for Salem Units 1 and 2, the most limiting accident is the drop of a fuel assembly. Additional, it describes the Control of Heavy Loads programmatic requirements to limit the loads over the spent fuel pool to less than 2200 pounds (weight of a fuel assembly and associated handling device). In paragraph 2 of page 6, describes the limitations imposed to the operation of fuel handling area ventilation system operation and the requirement to discontinue fuel movement if the ventilation system becomes inoperable. With the fuel handling area building doors closed, area radiation monitors provide the assessment in the area of potential radiological consequences following a FHA. Gamma radiation is continuously monitored in the FHB. A high level signal is alarmed locally and is annunciated in the Control Room. TSTF 51, Rev. 2 was reviewed and it is consistent with our submittal.

NRC Question 4:

In paragraph 5 of Containment Building Closure on page 5 of the submittal, the licensee states that, if containment closure would be hampered by an outage activity, compensatory actions will be developed. Briefly describe any expected outage activities that could prevent the establishment of containment closure and the compensatory actions that would need to be taken.

PSEG Response to Question 4:

Administrative controls were provided in paragraph 4 of page 5 of the July 29, 2002 submittal. The statement in paragraph 5 is meant to address any unusual activities that are not common to refueling outages. The TS surveillance 4.9.4.2 is intended to verify the capability to close the equipment hatch and identify any compensatory actions that may be required for off-normal work activities during defueling. In either case, the one-hour closure requirement remains in effect.

NRC Question 5:

In paragraph 3 of Fuel Handling Building Closure on page 6 of the submittal, PSEG states that, if fuel handling building closure would be hampered by an outage activity, compensatory actions will be developed. Briefly describe any expected outage activities that could prevent the establishment of fuel handling building closure and the compensatory actions that would need to be taken.

PSEG Response to Question 5:

Administrative controls were provided in paragraphs 1 and 2 of page 6 of the July 29, 2002 submittal. The statement in paragraph 3 is meant to address any unusual activities that are not common to refueling outages. Paragraph 1 in Page 6 also describes that the Fuel Handling Building shall be maintained closed except for normal entry and exit unless a designated person is available to close the open doors should a FHA occur within the Fuel Handling Building.

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ATTACHMENT 2

CORRECTED TECHNICAL SPECIFICATION
MARK-UP PAGES

TABLE 3.3-6
RADIATION MONITORING INSTRUMENTATION

INSTRUMENT	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ALARM/TRIP SETPOINT	MEASUREMENT RANGE	ACTION
1. AREA MONITORS					
a. Fuel Storage Area	1	*	≤ 15 mR/hr	10^{-1} - 10^4 mR/hr	19
b. Containment Area	2	1,2,3&4	$\leq 10^3$ R/hr	1 - 10^7 R/hr	23
2. PROCESS MONITORS					
a. Containment					
1) Gaseous Activity	1#	6	Set at less than or equal to 50% of the 10CFR20 concentration limits for gaseous effluents released to unrestricted areas.	10^1 - 10^6 cpm	22 & 23
a) Purge & Pressure - Vacuum Relief Isolation		and			
		1,2,3,4&5	per ODCM Control 3.3.3.9		
b) RCS Leakage Detection	1	1,2,3&4	N/A	10^1 - 10^6 cpm	20
2) Air Particulate Activity					
a) Purge & Pressure - Vacuum Relief Isolation (NOT USED)	1	6	$\leq 2 \times$ background	10^1 - 10^6 cpm	22
b) RCS Leakage Detection	1	1,2,3&4	N/A	10^1 - 10^6 cpm	20

* With fuel in the storage pool or building.

The plant vent noble gas monitor may also function in this capacity when the purge/pressure-vacuum relief isolation valves are open.

TABLE 3.3-6
RADIATION MONITORING INSTRUMENTATION

INSTRUMENT	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ALARM/TRIP SETPOINT	MEASUREMENT RANGE	ACTION
1. AREA MONITORS					
a. Fuel Storage Area	1	*	≤ 15 mR/hr	10^{-1} - 10^4 mR/hr	23
b. Containment Area	2	1,2,3&4	$\leq 10^3$ R/hr	1 - 10^7 R/hr	26
2. PROCESS MONITORS					
a. Containment					
1) Gaseous Activity	1#	6	Set at less than or equal to 50% of the 10CFR20 concentration limits for gaseous effluents released to unrestricted areas.	10^1 - 10^6 cpm	26
a) Purge & Pressure - Vacuum Relief Isolation		and			
		1,2,3,4&5	per ODCM Control 3.3.3.9		
b) RCS Leakage Detection	1	1,2,3&4	N/A	10^1 - 10^6 cpm	24
2) Air Particulate Activity					
a)a)Purge & Pressure - Vacuum Relief Isolation_(NOT USED)	1	6	≤ 2 x background	10^1 - 10^6 cpm	25
b) RCS Leakage Detection	1	1,2,3&4	N/A	10^1 - 10^6 cpm	24

* With fuel in the storage pool or building.

The plant vent noble gas monitor may also function in this capacity when the purge/pressure-vacuum relief isolation valves are open.

TABLE 4.3-3
RADIATION MONITORING INSTRUMENTATION SURVEILLANCE REQUIREMENTS

<u>INSTRUMENT</u>	<u>CHANNELS CHECKS</u>	<u>SOURCE CHECKS</u>	<u>CHANNEL CALIBRATION</u>	<u>CHANNEL FUNCTIONAL TEST</u>	<u>MODES IN WHICH SURVEILLANCE REQUIRED</u>
1. AREA MONITORS					
a. Fuel Storage Area	S	M	R	Q	*
b. Containment Area	S	M	R	Q	1, 2, 3 & 4
2. PROCESS MONITORS					
a. Containment Monitors					
1) Gaseous Activity					
a) Purge & Pressure Vacuum Relief Isolation	S	M	R	Q	1, 2, 3, 4, & 5 & 6
b) RCS Leakage Detection	S	M	R	Q	1, 2, 3 & 4
2) Air Particulate Activity					
a) Purge & Pressure Vacuum Relief Isolation (NOT USED)	S	M	R	Q	1, 2, 3, 4, & 6
b) RCS Leakage Detection	S	M	R	Q	1, 2, 3 & 4

*With fuel in the storage pool or building.