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Nuclear LLC

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United States Nuclear Regulatory Commission
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Washington, DC 20555

Gentlemen:

REQUEST FOR ADDITIONAL INFORMATION
LICENSE CHANGE REQUEST S99-21
SALEM GENERATING STATION
UNIT NOS. 1 AND 2
DOCKET NOS. 50-272 AND 50-311

The purpose of this letter is to provide additional information as a followup to a telephone conference conducted on March 22, 2001 with members of the NRC Staff led by Mr. Robert Fretz, NRC Project Manager for Salem. This telephone conference was the result of the review of the request for amendment to the Technical Specifications to incorporate the charcoal filter testing changes required by Generic Letter 99-02 submitted on May 31, 2000.

The Staff raised several questions regarding PSEG Nuclear's prior submittals concerning the Auxiliary Building Ventilation System (ABVS). In particular, the Staff wished to better understand the design and maintenance elements which assure that airflow is from clean to contaminated areas as described in the Salem Updated Final Safety Analysis Report (UFSAR).

The Salem UFSAR describes the design and safety functions of the ABVS, as follows:

> The ABVS operates continuously during all modes of operation to perform the following functions:
>
> 1. Provide satisfactory ambient temperatures within the building.
> 2. Direct airflow within the building always from the clean areas to the heat producing, contaminated, or potentially contaminated areas.

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3. Maintaining the building at a slight negative pressure to control the release of particulate and gaseous contamination from the building in accordance with 10 CFR 20 limits.
4. Purge the Containment Building at selected intervals (shutdown modes only) limited by administrative controls. Containment integrity is established during operational modes 1–4. The containment building can be purged in modes 5, 6 and defueled. This is controlled by Operations Department procedures.

System design and maintenance provide assurance that the airflow is from the clean to contaminated areas.

System Design

The Auxiliary Building Ventilation System (ABVS) is composed of two major subsystems: a supply system and an exhaust system. The supply air is forced into the building by fans and ductwork that distribute the air into clean areas of the building. The exhaust system, with its own fans and ductwork, is designed to draw air from the clean areas into potentially contaminated areas of the building. The exhaust system operates at a higher volumetric flow rate than the supply system, which keeps the building pressure slightly below atmospheric pressure and prevents unfiltered air from leaking out of the building.

The Auxiliary Building overall is maintained at a slight negative pressure. This is usually - 0.10" wg to - 0.125" wg. The building has an alarm if the negative pressure decreases to - 0.0025" wg to alert the Operations Department to take action.

The Auxiliary Building is physically separated into elevations via poured concrete walls and floors. The areas with the highest potential contamination are located in the lower elevations, below grade. The cleanest areas served by the exhaust system are located at the higher elevations.

The areas with the highest potential contamination are located at elevations 45' and 55'. These areas contain the Residual Heat Removal (RHR) pumps, support tanks and valve rooms. These areas are contained by poured concrete walls and floors, that vary in thickness from 12"-30" and the rooms are separated by walls and doors from other areas. The next highest potentially contaminated area is at the 64' elevation. This elevation contains tanks; waste gas decay tanks, waste hold up tanks, waste gas compressors, and valve rooms. This equipment is also in individual rooms with poured concrete walls and floors and

cubicles with doors. The next level is the 84' elevation which contains rooms housing the Charging pumps (high-head ECCS injection), Safety Injection (SI) pumps (intermediate-head ECCS injection), Component Cooling Water (CCW) heat exchangers and pumps, Auxiliary Feedwater (AFW) pumps, and other non-accident mitigation equipment. These areas are mostly walled off from each other, except not all pump rooms are completely enclosed (i.e., no doors on some of the cubicles). At the 84' elevation, the supply air is discharged into the clean end of the building and flows through the hallway. The exhaust duct in each room draws the air from the hallway into the room and keeps the contaminated air from going to the clean areas. The 100' elevation contains mechanical equipment, piping, primary chemistry lab, demineralizer bed areas and other non-accident mitigation equipment. The 122' elevation contains the ventilation equipment rooms for the Auxiliary Building and the Control Room Area and the Volume Control Tank.

The area with the highest potential contamination is approximately 30 feet below the clean areas of the Auxiliary Building. These areas are separated by poured concrete floors and the highest potentially contaminated areas are inside cubicles with doors.

The exhaust system is further separated by the ductwork serving some of the most potentially contaminated areas (Emergency Core Cooling System – ECCS equipment). The air being exhausted from these ECCS areas is drawn by the exhaust fans via ductwork and sent back to the exhaust system just upstream of the HEPA filters, in lieu of connecting to other Non-ECCS ductwork prior to being returned to the fans and filters. There is one branch of ductwork used exclusively for those areas that would have the highest potential for radioactivity during a LOCA in containment. These areas are the RHR pump rooms, SI pump rooms, Charging pump rooms, Main Pipe Chase, Spent Resin Rooms, Volume Control Tank and the Mechanical Penetration Area.

Areas that have a high heat concern are provided with room coolers that auto start when the room/area temperature exceeds a predetermined set point. In the case of the failure of the SI pump room cooler, the temperature in this room rises. Because of the high temperature due to the room cooler failure, a natural circulation flow is developed between the hallway and the SI pump room. This natural circulation flow rate is approximately equal to the room exhaust flow rate allowing contaminated air to flow out of the SI pump room. The effect of this contaminated air out flow on post-accident radiological consequences is negligible (unfiltered airborne leakage from the SI pump room is bounded by the conservatism in the filtration factor assumed in the analysis). Although the effect of failure of every room cooler in the Auxiliary Building has not been specifically

evaluated for natural circulation mixing, the SI pump room appears to be the only room susceptible to the natural circulation phenomenon due to room cooler failure which allows contaminated air to mix with the clean air.

Maintenance:

The 12(22) Filtration Unit can be aligned to draw on either the contaminated or non contaminated ductwork. Inlet dampers are included to provide the alignment. The Staff asked if these dampers provided a flow path from contaminated to clean areas and what maintenance activities are associated with this piece of equipment? The maintenance activities for 1(2)ABV3 dampers are as follows: preventive maintenance (PM) for these dampers is performed every six (6) years at which time the damper is disassembled, completely rebuilt and restored. Maintenance records indicate the PM for this damper was last performed October of 1999. A functional test of the damper is performed prior to returning to service. Additionally, during 18-month surveillance tests performed for the ABV exhaust fans, a visual inspection of the damper is conducted to ensure the correct damper position is obtained for the corresponding electric/pneumatic signal and the damper is cleaned if required.

Although there is no periodic task to perform balancing of the ABVS, the ABVS was balanced during the extended Salem shutdown. This balancing was completed around the October 1997 timeframe. The dampers that are considered balancing dampers are locked in position using locktite. Periodic walk downs of the ABVS are performed to ensure the proper functioning of the system.

In addition, the following is evidence the ABVS is operating properly and performing its intended functions (as described in the UFSAR):

1. The ABVS controls the air temperature throughout the Auxiliary Building by supplying fresh outside air to maintain the range of temperatures in the building from 60-110°F year round. Areas containing heat producing equipment are provided with room coolers, that are thermostatically controlled.

2. The ABVS is designed to supply air to the clean areas of the building and directly to the most contaminated areas. The ABVS uses exhaust registers located inside the potentially contaminated areas to draw the airflow from the clean areas to maintain the airflow from clean to dirty. There are no areas of the building where contamination is being spread to clean areas during normal system operation. HP/RadCon surveys verify this position.

3. The ABVS exhaust more air flow than is being supplied, which maintains the building at a slight negative pressure continuously. The exhaust airflow from the Auxiliary Building is directed to the ABV exhaust filtration units where the air is filtered and monitored prior to release to the atmosphere via the plant vent.

Should the above information be insufficient to resolve the Staff's questions, we would recommend a site visit and system walk-down. Please contact Brian Thomas at 856-339-2022 with any further questions or concerns.

Sincerely,

D. Garchow
Vice President – Operations

Affidavit

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STATE OF NEW JERSEY)
) SS.
COUNTY OF SALEM)

D. F. Garchow, being duly sworn according to law deposes and says:
I am Vice President – Operations for PSEG Nuclear LLC, and as such, I find the matters set forth in the above referenced letter, concerning the Salem Generating Station, Units Nos. 1 and 2, are true to the best of my knowledge, information and belief.

D. F. Garchow

Subscribed and Sworn to before me
this 2 day of August, 2001

Notary Public of New Jersey

My Commission expires on 10/13/02

ANN L. SHARP
NOTARY PUBLIC OF NEW JERSEY
My Commission Expires Oct. 13, 2002