GE Nuclear Energy

General Electric Company
175 Curtner Avenue, San Jose, CA 95125

June 24, 1993

Docket No. STN 52-001

Chet Poslusny, Senior Project Manager
Standardization Project Directorate
Associate Directorate for Advanced Reactors
and License Renewal
Office of the Nuclear Reactor Regulation

Subject: Submittal Supporting Accelerated ABWR Schedule - **Plant Systems Branch Information**

Dear Chet:

Enclosed is a SSAR markup of Subsection 9.4.6 which should have been included in my letter dated June 23, 1993.

Please provide a copy of this transmittal to Chandra.

Sincerely,

Jack Fox

Jack Fox
Advanced Reactor Programs

cc: Alan Beard (GE)
Gary Ehlert (GE)
Norman Fletcher (DOE)
Morry Munson (GE)
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9.4.6 Radwaste Building HVAC System

9.4.6.1 Design Bases

9.4.6.1.1 Safety Design Bases

The radwaste building HVAC system has no safety-related function as defined in Section 3.2. Failure of the system does not compromise any safety-related system or component and does not prevent safe reactor shutdown. Provisions are incorporated to minimize release of radioactive substances to atmosphere and to prevent operator exposure. The radwaste building HVAC P&ID is shown in Figure 9.4-10.

9.4.6.1.2 Power Generation Design Bases

The radwaste building ventilation system is designed to provide an environment with controlled temperature and airflow patterns to insure both the comfort and safety of plant personnel and the integrity of equipment and components. The radwaste building is divided into two zones for air conditioning and ventilation purposes. These zones are the radwaste control room and the balance of the radwaste building.

A positive static pressure with respect to the balance of the building and to atmosphere is maintained in the radwaste control room. The balance of the radwaste building is maintained at a negative static pressure with respect to atmosphere.

The system design is based on outdoor summer maximum of 115°F. Summer indoor temperatures include 75°F in the radwaste control station, 90°F in operating areas and corridors, a maximum temperature of 104°F in areas that may be occupied and 110°F in the equipment cells. Winter indoor design temperatures include 60°F in occupied areas, 70°F in the radwaste control room and 60°F in the equipment cells, based on an outdoor design temperature of -40°F.

9.4.6.2 System Description

9.4.6.2.1 Radwaste Building Control Room

Heating, cooling and pressurization of the control room are accomplished by an air-conditioning system. The air-conditioning system is a unit air-conditioner consisting of a water-cooled condenser, compressor, cooling coil, heating coil, filters and fan. Outdoor air and recirculating air are mixed and drawn through a prefilter, a heating coil, a cooling coil, and two 100% supply fans. One fan is normally operating and the other fan is onstandby. A pressure differential controller regulates the exfiltration from the control room to maintain it at a positive static pressure, preventing airborne contamination from entering.

The exhaust air system consists of two 100% exhaust fans. One fan is normally operating and the other is on standby. Exhaust air from the control room is ~~monitored for airborne radioactivity before exhausting~~ vented to the atmosphere.

9.4.6.2.2 Radwaste Building HVAC Control System

The HVAC control system for the remainder of the radwaste building is a once-through type. Outdoor air is filtered, tempered and delivered to the noncontaminated areas of the building. The supply air system consists of a prefilter, heating coil, cooling coil, and two 100% supply fans. One fan is normally operating and the other fan is on standby. The supply fan furnishes conditioned air through ductwork and diffusers, or registers to the work areas of the building. Zone preheat coils installed in the supply air ductwork provide temperature control. Air from the work areas is exhausted through the tank and pump rooms. Thus, the overall airflow pattern is from the least potentially contaminated areas to the most contaminated areas.

The exhaust air system consists of two 100% exhaust fans, one normally operating and one on standby. Exhaust air from the building ~~silo, waste filter rooms, oil separator room and the mixing and filling station is~~ is monitored for airborne radioactivity. ~~Under normal conditions with no contamination, normal ventilation in the same circuit as the other spaces in the building is maintained. Each of the above-noted spaces is separately monitored.~~ A high level of radioactivity activates an alarm in the main control room, ~~simultaneously isolating the affected space~~. The exhaust air is ~~exhausted~~ vented through the main plant stack.

An area radiation monitor is provided in the control room and will alarm on high radiation to alert the crew to high radiation.

9.4.6.3 Safety Evaluation

Although the HVAC system is not safety-related as defined in Section 3.2, several features are provided to insure safe operation. A completely separate HVAC System is provided for the control room. Pressure control fans for radwaste areas are redundant, with provision for automatic start of the standby unit. Radiation detectors and isolation dampers are provided to permit isolation and containment of any radioactive leakage.

9.4.6.4 Tests and Inspections

The system is designed to permit periodic inspection of important components, such as fans, motors, belts, coils, filters, ductwork, piping and valves, to assure the integrity and capability of the system. Local display and/or indicating devices are provided for periodic inspection of vital parameters such as room temperature, and test connections are provided in exhaust filter trains and piping for periodic checking of air and water flows for conformance to the design requirements. Portable test and monitoring equipment is available to balance the system when required.

9.4.6.5 Instrumentation Application

9.4.6.5.1 Radwaste Building Control Room

The air-conditioning unit for the control room is started manually. A temperature indicating controller modulates the air conditioning system via a three-way hot water valve to maintain space conditions. A differential pressure indicating controller modulates dampers in the return air ductwork and the room damper to maintain the positive static room pressure. Differential pressure indicators measure the pressure drop across the filter bank.

9.4.6.5.2 Radwaste Building Work Areas

The air exhaust and supply fans for the radwaste building are started manually. The fan inlet dampers open when the fan is started. A flow switch installed in the exhaust fan discharge duct actuates an alarm on indication of fan failure in the main and radwaste control rooms and automatically starts standby fan. The exhaust fan is interlocked with the supply fan to prevent the supply fan from operating if the exhaust fan is shutdown. 430.259

Two pressure-indicating controllers modulates variable inlet damper vanes in the supply fan to maintain the area at a negative static pressure with respect to atmosphere. The switch causes an alarm to be actuated if the negative pressure falls below the preset limit.

Differential pressure indicators measure the pressure drop across the filter section. The switch causes an alarm to be actuated if the pressure drop exceeds the preset limit.

ventilation exhaust duct.

Radiation monitors are installed in the radwaste building ~~vent~~. A high radiation signal in the vent causes ~~both a summing alarm and~~ an ~~audible~~ alarm to annunciate in the main control room ~~with an audible alarm sounding and a display light showing on the radwaste building HVAC control panel~~. In addition, the branch high radiation signal automatically closes the branch-isolating damper so that air conditioning is continued in the balance of the building.

G2 and G4 alarms in the ~~RW~~ RW/B Control room

If the vent high radiation alarm continues to annunciate, the work area branch ducts are manually isolated selectively to locate the affected building area. Should this technique fail, because the airborne radiation has generally spread throughout the building, control room air conditioning continues operating. However, the air conditioning for the for the balance of the building is shut down. The operators, using approved plant health physics procedures, then enter the work areas to locate and isolate the leakage source.

The supply and exhaust air ductwork have manually balancing dampers provided in the branch ducts for balancing purposes. The dampers are locked in place after the system is balanced.