Franke, Mark

From: Williams, Charles R. [Charles.Williams@pgnmail.com]
Sent: Tuesday, December 01, 2009 4:29 PM
To: Lake, Louis; Thomas, George; nausdj@ornl.gov; Carrion, Robert
Cc: Miller, Craig L
Subject: RE: Draft Refute 8.2 for Review
Attachments: Pages from FSAR Section 05.pdf

Exhibit 2 for Refute 8.2 would not open for reviewers. This file replaces the two previous Exhibit 2 FSAR files and will now open.

From: Williams, Charles R.
Sent: Tuesday, December 01, 2009 2:18 PM
To: 'louis.lake@nrc.gov'; 'George.Thomas2@nrc.gov'; 'nausdj@ornl.gov'; 'rpc1@nrc.gov'
Subject: Draft Refute 8.2 for Review

Mr Lake and others,
Attached for your review is draft of refute 8.2 with supporting exhibits. If you have any questions, please contact me.

Thank you,
Charles Williams
919-516-7417

8/178

5.5 VENTILATION AND PURGE SYSTEMS

5.5.1 DESIGN BASES

5.5.1.1 SYSTEM FUNCTIONS

The Reactor Building (RB) Ventilation and Purge Systems consist of the RB recirculation subsystem (AH-XA), RB area fans and coolers subsystem (AH-XB) and RB purge subsystem (AH-XC). These three subsystems were designed to perform the following functions:

a. Remove or add sensible heat under normal conditions of operation to maintain average RB air temperature below the Improved Technical Specification limit (130°F), and above a pre-determined minimum temperature (60°F). (AH-XA, AH-XB)

b. Remove sensible and latent heat under emergency conditions to reduce the building temperature and pressure from predetermined maximum values (281°F, 55 psig). This is an Engineered Safeguards (ES) function and therefore, is also described in Chapter 6. (AH-XA)

c. Recirculate air through demisters and throughout the reactor building. (AH-XA and AH-XB)

d. Supply filtered and tempered outside air to, and exhausts air from, the building when required, during Operational Modes 5 and 6. (AH-XC)

e. Filter air exhausted from the building through roughing, High Efficiency Particulate Air (HEPA) filters, and charcoal filters and then discharge it to the atmosphere through the plant vent, during Operational Modes 5 and 6. (AH-XC)

f. Maintain uniform temperature throughout the building during the integrated leak rate test. (AH-XA and AH-XB)

g. Reactor Building atmosphere can be purged or pressure equalized using the containment minipurge valves. (AH-XC and LR)

Additional information on the Reactor Building Cooling Systems is provided in Section 9.7.

5.5.1.2 SYSTEM SIZING

The system is sized to support the following operating modes:

a. Normal cooling load, ranging from approximately 6.0×10^6 Btu/hr (500 tons) during the winter months, to 12.0×10^6 Btu/hr (1000 tons) during the summer months. Available CI System cooling capacity exceeds 16.8×10^6 Btu/hr (1400 tons).

b. Outage cooling load, ranging from approximately 1.2×10^6 Btu/hr (100 tons) to 2.4×10^6 Btu/hr (200 tons). Maintaining an RB air temperature of 65°F (±5°F) during outages improves productivity while reducing the incidence of personal contamination.

c. Emergency cooling load, Loss-of-Coolant Accident (LOCA): Each RB Cooler shall have the capability to remove a minimum of 80×10^6 BTUs/hr from the RB atmosphere via condensate to

the RB sump and heat transfer to the SW system. No more than one (1) RB cooling fan will operate following receipt of an ES signal.

d. Normal heating load (outside design air temperature of 25°F, inside design air temperature of 60°F, full shutdown of plant): 615,000 Btu/hr.

e. Ventilation and exhaust rate (1.5 air changes per hour): 50,000 cfm. At this rate, the system reduces the activity level in the building to doses defined by 10 CFR 20 for a 40 hour occupational work week which will allow accessibility, within two hours after initiation of the purge systems, after establishing a Plant Operational Mode 5.

f. Reactor Building minipurge flow rates up to 1000 SCFM can be obtained using redundant control valves. Minipurge flow joins the normal Reactor Building Purge Exhaust System downstream of the redundant leak rate throttle valves.

5.5.2 DESCRIPTION

The Reactor Building Cooling Systems are subdivided into three major sets of components - Group A, Group B, and Group C. These are shown in the flow diagram Figure 5-27.

a. Group A

Group A components are those which filter (demister only) and recirculate air throughout the building under both normal and emergency conditions. Sensible and latent heat are removed as required. Included in this group are the reactor building fan assemblies and the auxiliary fan systems which deliver air to the operating floor, the reactor compartment, the service structure and the steam generator compartments. This group also includes the normal duty Industrial Cooling (CI) system, featuring a water cooled chiller, two evaporative cooling towers, and miscellaneous supporting equipment. The CI System supplies cooling water to the RB Fan Assemblies and Cavity Coolers during normal plant operation.

b. Group B

Group B components are those which supply filtered (85% efficiency) and electrically heated (tempering only) outside air to the building whenever required for purging, during Operational Modes 5 and 6. Included in this group are the two 48 inch diameter butterfly valves which seal the building air supply port.

c. Group C

Group C components are those which exhaust air from the building during Operational Modes 5 and 6 purging, pass it through roughing, HEPA, and charcoal filters, and then discharge it to the atmosphere through the unit vent. Included in this group are the two 48 inch diameter butterfly valves which seal the building air exhaust port.

d. General

Duct work is used with Group A components to return air to the main reactor building fan assemblies located in the lower part of the building. A portion of this supply air from these assemblies is picked up by auxiliary fan-duct systems for delivery to the steam generator compartment, the reactor compartment, and the operating floor area. The CRDM Shroud Exhaust Fans draw air from above the service structure and discharge out through the lower service structure area. The remainder of the air circulates due to the