



Westinghouse
Electric Corporation

Energy Systems

Box 355
Pittsburgh Pennsylvania 15230-0355

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DCP/NRC0699
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Document Control Desk
U. S. Nuclear Regulatory Commission
Washington, DC 20555

ATTENTION: T. R. QUAY

SUBJECT: AP600 DESIGN CERTIFICATION: RESPONSE FOR OPEN ITEM 293
(M9.4.8-2)

Dear Mr. Quay:

This is to respond to the December 17, 1996 telephone request by NRC for additional detail in response to Open Item 293 (M9.4.8-2). NRC requested Westinghouse to ensure proper requirements for HEPA filters on mobile radwaste processing equipment were included in Chapter 11 of the SSAR and that Chapter 9 included a statement of minimum efficiencies for filters in all non-DIC systems.

Both SSAR Sections 11.2 and 11.4 require the COL applicant/holder to obtain mobile radwaste processing equipment in accordance with Regulatory Guide 1.143. Regulatory Guide 1.143 is applicable to radwaste systems through "their point of discharge to the environment." Since Regulatory Guide 1.140 is applicable to HVAC systems, it is not directly referenced in Regulatory Guide 1.143. However, Regulatory Guide 1.143 does impose Regulatory Guide 8.8 which is applicable to radiation protection. Within Regulatory Guide 8.8, Regulatory Position C.1.d requires comprehensive review of radwaste treatment equipment for radiation protection features. Regulatory Position C.2.d requires control of airborne contaminate and gaseous radiation sources to specified limits. These requirements and the fact that mobile processing equipment may not have HVAC equipment, results in no need to specifically require Regulatory Guide 1.140 in the COL information items of Chapter 11.

Markups of changes to made in the SSAR, Revision 11, to specify filter requirements are shown on the attached pages.

If you have any questions, please call Jim Winters (412-374-5290).

Brian A. McIntyre, Manager
Advanced Plant Safety and Licensing

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cc: Diane T. Jackson - NRC (w/attachment)

attachment: Markups for SSAR pages 9.4-19, 9.4-30, 9.4-51, 9.4-56, and 9.4-67

subsystem consists of two 100 percent capacity air handling units, a return air duct system, automatic controls and accessories.

The air handling units are located directly within the space served.

9.4.2.2.2 Component Description

The annex/auxiliary buildings HVAC system is comprised of the following major components. These components are located in buildings on the Seismic Category I Nuclear Island or in the annex building. The seismic design classification, safety classification and principal construction code for Class A, B, C, or D components are listed in Section 3.2. Tables 9.4.2-1 and 9.4.2-2 provide the design parameters for major defense-in-depth components of the system.

Air Handling Units

Air handling units with integral supply and return/exhaust fans are utilized in the equipment room HVAC subsystem, switchgear room HVAC subsystem, and the mechanical equipment areas HVAC subsystem. Each air handling unit consists of a return/exhaust fan, a return/exhaust air plenum, a low efficiency filter bank, a high efficiency filter bank, a hot water heating coil with integral face/bypass damper, a chilled water cooling coil, and a supply air fan.

Supply Air Handling Units

Supply air handling units are utilized in the general area HVAC subsystem, main steam isolation valve compartment HVAC subsystem, and the valve/piping penetration room HVAC subsystem. Each air handling unit consists of a low efficiency filter bank, a hot water heating coil, a chilled water cooling coil, and a supply fan. The general area HVAC subsystem air handling unit also includes a high efficiency filter bank and has face and bypass dampers on the heating coil.

Supply and Exhaust Air Fans

The supply and exhaust fans are centrifugal type, single width single inlet (SWSI) or double width double inlet (DWDI), with high efficiency wheels and backward inclined blades to produce non-overloading horsepower characteristics. Air handling unit fans that have little or no ductwork may utilize forward curved blades. The fans are designed and rated in accordance with ANSI/AMCA 210 (Reference 4), ANSI/AMCA 211 (Reference 5), and ANSI/AMCA 300 (Reference 6).

Low Efficiency Filters and High Efficiency Filters

The low efficiency filters ^(25%) and high efficiency filters ^(85%) have a rated dust spot efficiency based on ASHRAE 52 (Reference 7). The filters meet UL 900 (Reference 8) Class I construction criteria.

9.4.3.2.2 Component Description

The radiologically controlled area ventilation system is comprised of the following major components. These components are located in buildings on the Seismic Category I Nuclear Island and the Seismic Category II portion of the annex building. The seismic design classification, safety classification and principal construction code for Class A, B, C, or D components are listed in Section 3.2. Table 9.4.3-1 provides design parameters for major defense in depth components in the system.

Supply Air Handling Units

Each supply air handling unit consists of a low efficiency filter bank, a high efficiency filter bank, a hot water heating coil bank, a chilled water cooling coil bank, and a supply fan. The radiation chemistry laboratory supply air handling units only consist of a high efficiency filter bank, a hot water heating coil bank and a supply fan.

Supply and Exhaust Air Fans

The supply and exhaust air fans are centrifugal type, single width single inlet (SWSI) or double width double inlet (DWDI), with high efficiency wheels and backward inclined blades to produce non-overloading horsepower characteristics. The fans are designed and rated in accordance with ANSI/AMCA 210 (Reference 4), ANSI/AMCA 211 (Reference 5), and ANSI/AMCA 300 (Reference 6).

Unit Coolers

Each unit cooler consist of a low efficiency filter bank, a chilled water cooling coil bank and a supply fan. The normal residual heat removal system pump room unit coolers have redundant cooling coil banks.

Low and High Efficiency Filters

The low efficiency ^(25%) filters and high efficiency ^(80%) filters have a rated dust spot efficiency based on ASHRAE 52 (Reference 7). The filters minimum average dust spot efficiencies for the defense in depth filters are shown in Table 9.4.3-1. The filters meet UL 900 (Reference 8) Class I construction criteria.

Electric Unit Heaters

The electric unit heaters are single-stage or two-stage fin tubular type. The electric unit heater are UL-listed and meet the requirements of UL-1025 (Reference 26) and National Electric Code (Reference 28).

draft dampers are provided at each mobile system connection to prevent blowback through the equipment in the event of exhaust system trip.

9.4.8.2.2 Component Description

The radwaste building HVAC system is comprised of the following major components. These components are located in the non-seismic radwaste building.

Supply Air Handling Units

Each air handling unit consists of a plenum section, a low efficiency filter bank, a high efficiency filter bank, a hot water heating coil, a chilled water cooling coil bank, and a supply fan with automatic inlet vanes.

Supply and Exhaust Air Fans

The supply and exhaust fans are centrifugal type, single width single inlet (SWSI) or double width double inlet (DWDI), with high efficiency wheels and backward inclined blades to produce non-overloading horsepower characteristics. The fans are designed and rated in accordance with ANSI/AMCA 210 (Reference 4), ANSI/AMCA 211 (Reference 5), and ANSI/AMCA 300 (Reference 6).

Low Efficiency Filters and High Efficiency Filters

The low efficiency filters ^(25%) and high efficiency filters ^(85%) have a rated dust spot efficiency based on ASHRAE 52 (Reference 7). The filters meet UL 900 (Reference 8) Class I construction criteria.

Hot Water Unit Heaters

The hot water unit heaters consist of a fan section and hot water heating coil section factory assembled as a complete and integral unit. The unit heaters are either horizontal discharge or vertical downblast type. The coil ratings are in accordance with ANSI/ARI 410 (Reference 12).

Cooling Coils

The chilled water cooling coils are counterflow, finned tubular type. The cooling coils are designed and rated in accordance with ASHRAE 33 (Reference 11) and ANSI/ARI 410 (Reference 12).

Heating Coils

The hot water heating coils are counterflow, finned tubular type. The heating coils are designed and rated in accordance with ASHRAE 33 (Reference 11) and ANSI/ARI 410 (Reference 12).

the integral face/bypass dampers for heating. Outside air is mixed with recirculated air to maintain a positive pressure.

The personnel work area HVAC system consists of two 50 percent capacity air handling units, a ducted supply and return air system, automatic controls, and accessories. The air handling units are located on elevation 149'-0" of the turbine building. The temperature of the rooms is maintained by thermostats which control the chilled water control valves for cooling and the integral face/bypass dampers for heating. Electric reheat coils are provided in the ductwork to each room to maintain close temperature control. Outside air is mixed with recirculated air to maintain a positive pressure.

9.4.9.2.1.3 Local Area Heating and Ventilation

The lube oil reservoir room, clean and dirty lube oil storage room, toilet areas (facilities), and secondary sampling laboratory fume hood have centrifugal exhaust fans to remove flammable vapors, odors, or chemical fumes as required.

The auxiliary boiler room, diesel driven fire pump room, and motor driven fire pump rooms have exhaust ventilators to remove heat generated by the boiler equipment and fire pumps. Air is pulled from the general area of the turbine building through wall fire damper openings in the rooms and is exhausted outside of the turbine building to the atmosphere. Each fire pump room is heated by a hot water unit heater to provide freeze protection for the fire pumps. Hot water heating is not provided in the auxiliary boiler room, however, air is pulled from the general area of the turbine building to control space temperature in the boiler room.

9.4.9.2.2 Component Description

The turbine building ventilation system is comprised of the following major components. These components are located in the non-seismic turbine building.

HVAC Air Handling Units

Each air handling unit is a horizontal draw-through cabinet type consisting of a mixing box section, low efficiency filter, high efficiency filter, integral face/ bypass damper, hot water heating coil, chilled water cooling coil. The electrical equipment room air handling units include a return air fan and an exhaust fan. The personnel area air handling units include a supply air fan.

Exhaust Ventilators

The turbine building roof exhaust ventilators are hooded, direct driven, propeller type with pneumatic operated backdraft damper. Ventilators in the auxiliary boiler room and fire pump room are smaller, two-speed, propeller type with pneumatically actuated backdraft dampers. Ventilators in the lube oil rooms and restrooms are centrifugal type.



Humidification is controlled to maintain a minimum 35 percent relative humidity via a steam humidifier.

The exhaust air system consists of two 100 percent capacity exhaust centrifugal fans with ductwork and automatic controls, and a separate machine shop exhaust fan and high efficiency filter for exhausting from machine tools and other localized areas in the hot machine shop. The exhaust fans are located in the staging and storage area on elevation 135'-3" of the annex building. The machine shop exhaust fan and filter are located locally in the machine shop. The air flow rates are balanced to maintain a constant exhaust design air flow through the fans.

The exhaust fans discharge to a common duct which is routed to the plant vent stack. A radiation monitor measures activity in the common discharge duct downstream of the exhaust fans and activates an alarm in the main control room when excess activity in the effluent discharge is detected. The radiation monitoring system is described in Section 11.5.

Individual flexible exhaust duct branches are provided to machine tools. The flexible ducts are connected to a hard duct manifold which is connected to a filter and exhaust fan. The exhaust fan discharges into the main system exhaust ductwork.

9.4.11.2.2 Component Description

The health physics and hot machine shop HVAC system is comprised of the following major components. These components are located in the Seismic Category II portion of the annex building.

Supply Air Handling Units

Each air handling unit consists of a low efficiency filter bank, a high efficiency filter bank, a hot water heating coil, a chilled water cooling coil bank, and a supply fan with automatic inlet vanes.

Supply and Exhaust Air Fans

The supply and exhaust fans are centrifugal type, single width single inlet (SWSI) or double width double inlet (DWDI), with high efficiency wheels and backward inclined blades to produce non-overloading horsepower characteristics. The fans are designed and rated in accordance with ANSI/AMCA 210 (Reference 4), ANSI/AMCA 211 (Reference 5), and ANSI/AMCA 300 (Reference 6).

Low Efficiency Filters and High Efficiency Filters

The low efficiency filters ^(25%) and high efficiency filters ^(80%) have a rated dust spot efficiency based on ASHRAE 52 (Reference 7). ~~Filter minimum average dust spot efficiency is shown in Table 9.4.11.1.~~ The filters meet UL 900 (Reference 8) Class I construction criteria.