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SUBJECT: Forwards responses to six NRC questions re control room habitability mods.

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United States Nuclear Regulatory Commission
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H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2
DOCKET NO. 50-261/LICENSE NO. DPR-23
RESPONSE TO QUESTIONS REGARDING CONTROL ROOM HABITABILITY

Gentlemen:

This letter provides responses to six NRC questions regarding the Control Room Habitability modification planned to be implemented at H. B. Robinson Steam Electric Plant Unit No. 2. A response to a seventh question will be provided separately.

These questions originated during a June 12, 1990 telephone conversation between Mr. Charles Nichols, NRC, and Mr. Jan Kozyra, CP&L, and during a July 31, 1990 meeting at the NRC office in Rockville, MD. The responses are attached.

Questions regarding this matter may be referred to Mr. R. W. Prunty at (919) 546-7318.

Yours very truly,

RW Prunty
for L. I. Loflin
Manager
Nuclear Licensing Section

JSK/ecc (776RNP)

cc: Mr. S. D. Ebneter
Mr. L. Garner (NRC-HBR)
Mr. R. Lo

00139

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A003
1/1

Question 1. The July 26 letter says the system will remain functional considering a single failure of active components. Clarify that this applies to single failures of safety and non-safety related components. For example: will the emergency system remain functional following failure of normal intake or exhaust dampers to close, or failure of a fan to deactivate.

Response 1. The current proposed system is fully redundant for active components which perform a safety function. Passive components include gravity dampers, the filter train, pressurization seals, and ductwork.

The normal intake is also the emergency intake. There is no requirement for the normal intake to close as a safety function since the toxic gas analysis, as approved in the original SER, shows that detection and isolation are not required. The intake must open for envelope pressurization and this safety function is redundant (two dampers in parallel). The normal exhaust must close for envelope pressurization and this safety function is redundant (two dampers in series).

Failure of a fan to deactivate is not credible as it would require two failures or one failure plus inadvertent operator action to start 2/2 fans.

All non-safety components are either monitoring functions for normal operation (with only a pressure boundary safety function) or not required for the safety function of the system (dampers fail to the safe position on loss of non-safety instrument air). Non-safety related control components which interface with the safety-related portion of the system are configured such that the failure of a non-safety component will have no effect on a safety system function. The exceptions to this are the seals for the control room pressurization envelope (door seals, penetration seals, domestic piping with loop seals) in that these seals are not seismically designed and the control room rad monitor which is non-safety but has been accepted for its post accident function under CP&L's commitments to Regulatory Guide 1.97.

Question 2. Clarify whether the operator dose calculations described in the 5/21 submittal consider the worst case single failure.

Response 2. There are two of each active safety-related component, i.e. two trains of equipment. The dose calculation assumes that one out of two (1/2) of each of these active components performs its safety function, that there are no failures of passive equipment as defined in 1. above, and that there are no pressurization seal failures.

Question 3. Clarify how the CR Hab system is designed to protect the operators from toxic and hazardous gases. Describe recent assessments performed to determine the need for CR toxic gas detector and isolation requirements.

Response 3. The original NUREG 0737 study (NUS 3696, December 1980) and the highway survey study (NUS 4572, December 1984) still form the basis for the design with respect to toxic and hazardous gases. These studies were the bases of the original proposed design and the SER for that design determined the approach to these gases to be adequate. The current proposed design still credits these studies.

Question 4. Provide justification for the apparent discrepancy between the CR vent system filter organic iodine efficiency of 95% assumed in the dose calcs and the TS acceptance criteria of less than or equal to 1% bypass for the adsorber in-place test and iodine removal efficiency of greater than or equal to 90% for the carbon lab test; or provide a request to change the lab test acceptance criteria to greater than or equal to 99% removal efficiency; or provide a revised dose calc. based on an assumed iodine efficiency of 50%; or request a TS change to greater than or equal to 95% removal efficiency and assume 75% in the dose calcs.

Response 4. The existing Technical Specification with respect to the system filter is to be changed. The design basis removal efficiency is in keeping with Regulatory Guide 1.52 for a 2" depth bed and the proposed TS will require testing to conform to Regulatory Guide 1.52, Rev. 2, March 1978, Position C.6.a (i.e. 99% laboratory tested retention gives a 95% assigned efficiency).

Question 5. Provide justification for assuming the leakage rate from the ECCS is two times the maximum allowable TS leakage in accordance with SRP Section 15.6.5, Appendix B, when the ECCS area is served by an ESF atmosphere filtration, i.e. justify that the auxiliary building filter system is an ESF filter system.

Response 5. In response to NUREG 0737, the initial CRVS design submittal to NRC calculated the dose to the control room operators based on as-found ECCS leakage (165.7 cc/min, 2.63 gph) discovered during tests performed as part of CP&L's response to NUREG 0578 (Item 2.1.6a, response dated 12/31/79). The SER approving the initial CRVS design was approving a design which could mitigate this tested ECCS leakage as the design basis ECCS leakage. In reviewing the NUS methodology, CP&L determined that this basis was not defendable and an appropriate basis was researched for the current proposed design.

The Auxiliary Building filter system is not an ESF filter system but this is not the reason that the CRVS design basis does not conform to the SRP for ECCS leakage.

At the time the design was revised, it was decided to use the SRP as a basis for known potential leakage. Additional information relative to this assumption will be provided in a separate response; regardless, at the time the current proposed design was frozen, passive failures of seismically

designed piping systems were not assumed to be a design basis for RNP and, therefore, assuming a passive failure of ECCS piping as a design basis for the CRVS system was not appropriate. Issues which arise from CP&L's Design Basis Reconstitution project will be resolved as described in our May 21, 1990 letter.

Question 6. Provide a description of the auxiliary building filter system.

Response 6. Pertinent pages from the HVAC System Description Procedure are attached.

1.0 GENERAL DESCRIPTION (Continued)

1.2.10 Cold Lab

This area is serviced by the air supply unit HP-1. The unit consists of two sections: HP-1A and HP-1B. HP-1A consists of the indoor section of the heat pump. Refrigerant liquid for the cooling coil of HP-1A is supplied by the outdoor section (HP-1B) of the split-system heat pump, and refrigerant gas is returned to the same outdoor section. The indoor section has an electric duct heater (EDH-1) together with ductwork, ductwork auxiliaries and air distribution terminals.

1.2.11 Reactor Auxiliary Building Main Supply and Exhaust

The main air supply unit for the Reactor Auxiliary Building is supply unit HVS-1. HVS-1 supplies treated outdoor air during the summer, and partly return/partly outdoor air during the winter.

Heating steam to coils in HVS-1 is supplied from the Auxiliary Steam System, and condensate is returned to the same system. Supply water to the cell type air washers is supplied from the Service Water System.

The inter-area air transfer in system HVS-1 is accomplished by maintaining a pressure differential between the supply air outlets and exhaust intakes so that the direction of air flow is always from areas of lower contamination to areas of higher contamination.

Part of the air supplied by HVS-1 is collected and returned to the unit during winter. This is accomplished by a return air system that includes fan HVE-7. The total amount of air handled by HVE-7 includes air from the Electrical Equipment Area, Relay Room No. 1, Surge Tank Area, and the H&V Equipment Room. The rest of the air supplied by HVS-1 is exhausted by two sets of exhaust units: HVE-5A, 5B and HVE-2A, 2B. HVE-5A and 5B exhaust to HVE-2A and 2B through a filtering unit. HVE-2A and 2B are connected to the plant stack.

2.0 COMPONENT DESCRIPTION (Continued)

2.1[illegible] HP-1B

The ou[illegible]on of the split-system hea[illegible]sts of refrigerant compressor, with drive [illegible]oled condenser with coil and fan with dri[illegible]otor, liquid receiver, automati[illegible]nd sheet metal [illegible]asing.

2.11 Reactor Auxiliary Building Main Supply and Exhaust

2.11.1 Supply Unit HVS-1

The air supply unit HVS-1 contains prefilters, steam heating coils, cell type air washer, centrifugal fan with drive and motor, and is enclosed in a sheet metal casing. The air intake of the unit is connected to dampered outdoor air louvers, and the supply air is discharged into an air distribution system which consists of ductwork, ductwork auxiliaries and air distribution terminals.

2.11.2 Exhaust Units HVE-5A and HVE-5B

These units consist of high efficiency particulate air (HEPA) filters, activated carbon adsorbers in one sheet metal enclosure, and two 100 percent capacity axial flow fans each with drive and motor. The discharge of these units is connected to the intake of exhaust units HVE-2A and HVE-2B.

2.11.3 Exhaust Units HVE-2A and HVE-2B

These exhaust air units HVE-2A and HVE-2B (standby) consist of air intake terminals, ductwork, ductwork auxiliaries, prefilters, and HEPA filters. The discharge from these units is directed to the plant stack.

[illegible] RHR Pit, SI and AFW Pump Rooms

2.12.1 HVH-8A and HVH-8[illegible]

Each air handling unit con[illegible] driven fan and water supplied cooli[illegible]osed in a sheet meta[illegible]. Air is supplied and exhausted directly into the RHR Pit atmosphere.

3.7 INSTRUMENTATION AND CONTROL (Continued)

An electric thermostat located in each room annunciates and sounds an alarm on the RTGB when the room temperature is above 110°F.

3.8 Turbine Building Service Area Supply and Exhaust

Unit HVAC-1 is controlled by a local thermostat located on the corridor wall. This starts the fan and energizes the compressor or heaters. Exhaust fan HVE-13 runs continuously within local control and acts to create a slightly negative pressure in the C.V. access area.

The men's and ladies' restroom ventilation fans run continuously while the heaters are controlled by local thermostats.

3.9 Hot Lab

An electric thermostat located in the Hot Lab energizes the room air conditioning to control room temperature.

3.10 Cold Lab

An electric thermostat located in the Cold Lab starts and stops the compressor, condenser fan, and electric duct heater.

3.11 Reactor Auxiliary Building Main Supply and Exhaust

Supply air unit HVS-1 is interlocked with exhaust fans HVE-2A and HVE-2B. Starting of the exhaust fan HVE-2A or HVE-2B will start the supply air unit HVS-1. The thermostat controlled return, exhaust and outdoor air dampers open or close depending on the outdoor air temperature. "HVS-1 Trouble" is annunciated on the RTGB on low flow, low temperature or loss of power. Filters and evaporator pads are straddled by filter gage. HVE-2A and 2B are started manually through switches with indicating lights located on the RTGB.

3.0 INSTRUMENTATION AND CONTROL (Continued)

Fans HVE-2A and 2B are interlocked so that on a motor electrical trip, the standby fan starts automatically and annunciator "HVE-2A/B Air Flow LOST/OL" is actuated. On flow failure, an air flow switch (in the discharge of each fan) starts the standby fan after a 20 second time delay, de-energizes the controls of the fan that failed, annunciates low flow, and sounds an alarm for standby running.

A pitot tube sensing velocity pressure, located in the common discharge duct, modulates (through a differential pressure controller) the filter dampers to maintain constant air flow.

Booster fans HVE-5A and 5B for charcoal and absolute filters are interlocked with HVE-2A and 2B fans. Manual starting of HVE-5A and 5B closes the normal flow damper automatically, opens the filter damper and starts the fan with indicating lights located on the RTGB. The damper positions are shown on the RTGB with indicating lights.

If the motor of HVE-5A electrically trips, the standby fan, HVE-5B will start automatically. An air flow switch in the filter duct also starts the standby fan on flow failure after a 20 second time delay, de-energizes the controls of the fan that failed, annunciates low flow, and sounds an alarm for standby running.

3.0 INSTRUMENTATION AND CONTROL (Continued)

A pitot tube sensing velocity pressure, located in the inlet duct to the filters, modulates through a differential pressure controller, the filter damper to maintain constant air flow through the filters. The filter damper opens automatically when either exhaust fan HVE-5A or 5B is energized. Fresh air intake louver and fan discharge dampers open, and controls are energized when HVS-1 fan is energized. A modulating thermostat, set at 50°F, controls the air temperature leaving the steam coil by throttling the steam valve to each coil section. A thermostat in the return air readjusts the modulating thermostat to maintain a minimum return air temperature of 50°F. A thermostat located in the discharge of HVS-1 annunciates and sounds an alarm on the RTGB when discharge temperature is below 35°F.

Exhaust fans HVE-7 and evaporative air cooler pump P-3 are energized when supply fan HVS-1 is energized. When the outdoor temperature is below 60°F, the pump is de-energized, the return air damper to HVS-1 opens, and the exhaust damper of HVE-7 closes. When the outdoor temperature is above 60°F, the pump P-3 is energized, the return air damper closes, and the exhaust damper opens.

Electric duct heaters EDH-2 and 3 are energized through a room thermostat when supply fan HVS-1 is energized.

3.[illegible] RHR Pit, SI, and AFW Pump Rooms

[illegible] HVH-6A and HVH-6B are started by the containment [illegible] pump(s) and safety injection pump(s).

Units HVH-7A and HVH-7B sta[illegible]matically when any pump in that area is started. HVH-[illegible] and HVH-8B [illegible]ntrolled similarly (see Section 5.11).

[illegible]icating lights on the RTGB show units off or running.

Item and Location	Description	Function	Set Point
SV-A19, HVE-18	Solenoid Valve	Open exhaust air damper	N/A
TS-A12, HVS-6	Thermostat	Annunciate "High Temp." and sound alarm	110°F ± 5°F
TS-A2, HVH-6A and HVH-6B	Thermostat	Annunciate "High Temp." and sound	110°F ± 5°F alarm
TS-A3, HVH-7A and HVH-7B	Thermostat	Annunciate "High Temp." and sound	110°F ± 5°F alarm
TS-A4, HVH-8A	Thermostat	Annunciate "High Temp." and sound alarm	110°F ± 5°F
TS-A5, HVH-8B	Thermostat	Annunciate "High Temp." and sound alarm	110°F ± 5°F
SV-A3, HVE-2A	Solenoid Valve	Open for discharge damper	N/A
SV-A4, HVE-2B	Solenoid Valve	Open for discharge damper	N/A
HVE-2A, HVE-2B	Differential Pressure Regulator	Energize pneumatic relay and outdoor air damper operator	N/A
HVE-2A, HVE-2B	Pneumatic Relay	Modulate fan discharge dampers	N/A
FS-A2, HVE-2A	Airflow Switch	Start standby fan, annunciate "Low Flow" and sound alarm	N/A
FS-A24, HVE-2B	Airflow Switch	Start standby fan, annunciate "Low Flow" and sound alarm	N/A
HVE-5A, HVE-5B	Differential Pressure Regulator	Energize pneumatic relay and inlet damper operators	N/A
HVE-5A, HVE-5B	Pneumatic Relay	Modulate fan inlet dampers and energize SV-A1 and SV-A2	N/A

3.0 INSTRUMENTATION AND CONTROL (Continued)

Item and Location	Description	Function	Set Point
SV-A1, HVE-5A	Solenoid Valve	Interlock with HVE-5B	N/A
SV-A2, HVE-5B	Solenoid Valve	Interlock with HVE-5A	N/A
FS-A1, HVE-5A	Airflow Switch	Start standby fan, annunciate "Low Flow" and sound alarm	N/A
FS-A23, HVE-5B	Airflow Switch	Start standby fan, annunciate "Low Flow" and sound alarm	N/A
[illegible]-A30, EUH-1	Thermostat	Start/stop unit heater fan	50°F ± 3°F
HVS-2	Temperature Sensor	Energize controller	70°F ± [illegible]F
HVS-2	[illegible]ntroller	Modulate steam control valve	N[illegible]
HVS-2	Tempera[illegible]re Sensor	Energize controller	50°F ± 3°F
SV-A10, HVS-2	Solenoid Valve	O[illegible]n outdoor a[illegible] damp[illegible]	N/A
TS-A10, HVS-2	Thermostat	Annunci[illegible] "Low Temp." and s[illegible]d [illegible]rm	35°F ± 2°F
HVS-4	Temperature	[illegible]rgize contro[illegible]er	65°F ± 3°F
HVS-4	Controller	Modulate steam con[illegible]l valve	N/A
HVS-4	Tem[illegible]ature S[illegible]sor	Energize controller	[illegible]°F ± 3°F
SV-A11, HVS-4	Solenoid Valve	Open outdoor air damper	N/A
TS-A11[illegible]VS-4	Thermostat	Annunciate "Low Temp." and sound alarm	35°F ± 2°[illegible]
[illegible]V-A12, HVE-14	Solenoid Valve	Open fan discharge damper	N/A

3.0 INSTRUMENTATION AND CONTROL (Continued)

Item and Location	Description	Function	Set Point
EUH-D	Thermostat	Start/stop Unit Heater	As req'd to limit bldg. temp. to 55°F.
EUH-E	Thermostat	Start/stop Unit Heater	
EUH-F	Thermostat	Start/stop Unit Heater	Limit temp. to 68°F
EUH-G	Thermostat	Start/stop Unit Heater	Limit temp. to 68°F

3.16 Annunciator

The following is a list of instrumentation that supply alarms. Their setpoints will be found in the annunciator procedures.

WINDOW NAME	CONTROLLER NO.	WINDOW NO.
HVS-1 TROUBLE	TS-A1	APP-010-5
HVA-1 CONTR ROOM FAN TROUBLE/ RAD START	R-1	APP-010-8
HVS-2 DISCH. TEMP. LO/OL	TS-A10	APP-010-13
→ HVE-2A/B AIR FLOW LOST/OL	N/A	APP-010-15
CABLE RM TEMP HI/OL	TS-A42, TS-A43	APP-010-16
HVS-4 DISCH. TEMP. LO/OL	TS-all	APP-010-21
SAFETY INJ. PUMP AREA TEMP HI	TS-A2	APP-010-24
→ HVE-5A/B AIR FLOW LOST/OL	N/A	APP-010-30
RES. HEAT REM PUMP A AREA TEMP HI	TS-A4	APP-010-32
DIESEL RM A COOL FAN OL/TEMP HI	TS-A12	APP-010-37
DIESEL RM B COOL FAN OL/TEMP HI	TS-A13	APP-010-38
HVE-14/15 AIR FLOW LOST/OL	N/A	APP-010-39
RES HEAT REM PUMP B AREA TEMP HI	TS-A5	APP-010-40
AUX FWP AREA TEMP HI	TS-A3	APP-010-48
NO AIR FLOW BAT RM FAN A	N/A	APP-021-20
NO AIR FLOW BAT RM FAN B	N/A	APP-022-12
COMP COOL ROD DRIVE COOL LO FLOW	FS-A10, FS-A20	APP-001-8
HVH-1 AIR FLOW LOST	N/A	APP-002-5
HVH-1 OVERLOAD/TRIP	N/A	APP-002-6
HVH-1, 2, 3, 4 HI VIBRATION	N/A	APP-002-7
HVH-2 WTR OUTLET FLOW LO	N/A	APP-002-8
HVH-2 AIR FLOW LOST	N/A	APP-002-13
HVH-2 OVERLOAD/TRIP	N/A	APP-002-14
HVH-2 WTR OUTLET FLOW LO	N/A	APP-002-16
HVH-3 AIR FLOW LOST	N/A	APP-002-21
HVH-3 OVERLOAD/TRIP	N/A	APP-002-22
HVH-3 WTR OUTLET FLOW LO	N/A	APP-002-24
HVH-4 AIR FLOW LOST	N/A	APP-002-29

3.0 INSTRUMENTATION AND CONTROL (Continued)

WINDOW NAME	CONTROLLER NO.	WINDOW NO.
HVH-4 OVERLOAD/TRIP	N/A	APP-002-30
HVH-4 WTR OUTLET FLOW LO	N/A	APP-002-32
HVH-1/2/3/4 EMERGENCY CONTROL	N/A	APP-002-38
HVH 6/7/8 VITAL AC LOST	N/A	APP-002-46
HVH-5A/B AIR FLOW LOST/OL	N/A	APP-010-30
HVH-9A/B AIR FLOW LOST/OL	N/A	APP-010-7
HVE-1A/B AIR FLOW LOST/OL	N/A	APP-010-14
HVE-3 MTR OL/AIR TROUBLE	N/A	APP-010-22
HVE-4 MTR OL/AIR TROUBLE	N/A	APP-010-23
HVH-5A/5B INTAKE AIR TEMP HI	N/A	APP-010-29
HVE-6A/B AIR FLOW LOST/OL	N/A	APP-010-31
CONTAINMENT INTAKE AIR TEMP LO	N/A	APP-010-47

3.17 Power Supplies

The table below gives the power supplies for all units that make up the HVAC System.

Unit/Power Supply	
HVS-1	MCC No. 5
HVS-2	PP No. 22
HVS-4	PP No. 22
HVS-5	MCC No. 6
HVS-6	MCC No. 5
HVS-7	MCC No. 11

Unit/Power Supply	
HVE-1A	MCC No. 2
HVE-1B	MCC No. 1
HVE-2A	MCC No. 5
HVE-2B	MCC No. 6
HVE-3	MCC No. 5
HVE-4	MCC No. 6
HVE-5A	MCC No. 5
HVE-5B	MCC No. 6
HVE-6A	MCC No. 20
HVE-6B	MCC No. 17
HVE-7	MCC No. 2
HVE-8A	MCC No. 9
HVE-8B	MCC No. 10

4.0 SYSTEM AND COMPONENT DESIGN (Continued)

Exhaust Air from the Following Areas may, under Certain Conditions, Carry Radioactive Iodine and/or Methyl Iodide.
Containment, Residual Heat Removal Pump Room, Fuel Handling Building Pipe Space, Reactor Auxiliary Building Pipe Space, Demineralizer Corridors, Safety Injection Pump Room, Residual Heat Exchanger Room.

The direction of air flow shall be such that air will always move from areas of lower radioactive contamination or contamination possibility toward areas of higher radioactive contamination or contamination possibility, without separating the respective supply and exhaust systems.

The following systems must remain operable on emergency power following an accident:
Containment Air Recirculation Cooling System: HVH-1, HVH-2, HVH-3, HVH-4
Control Rod Drive Mechanism Cooling System: HVH-5A and HVH-5B
Containment Air Iodine Removal Exhaust System: HVE-3 and HVE-4
Air Supply Systems: HVS-1, HVS-5, HVS-6
Air Conditioning System: HVA-1
Air Cooling Systems: HVH-6A, HVH-6B, HVH-7A, HVH-7B, HVH-8A, HVH-8B
→ Air Exhaust Systems: HVE-2A, HVE-2B, HVE-17, HVE-18, HVE-19

All Heating, Ventilation and Air-Conditioning Systems will be able to withstand the following seismic conditions:
Class I seismic requirements:
1. All systems in containment
→ 2. All supply and exhaust systems in Auxiliary Building

4.0 SYSTEM AND COMPONENT DESIGN (Continued)

3. Recirculation Cooling System for:
   a. Safety injection pumps
   b. Auxiliary feedwater pumps
   c. Residual heat removal pumps

All other systems installation shall be designed to satisfy Class III seismic requirements.

The static equivalent force corresponding to the Class I seismic requirement shall have a value of 0.5 g (or half of the weight of the supported element) exerted on the supports in all directions additional to its own weight, for the Reactor Containment Building and Reactor Auxiliary Building at any height.

For Class III systems, the value shall be 0.05 g in all directions. Supports shall prevent displacement of the equipment in any direction with the assumption that friction does not exist, and shall assure that no interference or undue deflections will result.

Vertical and horizontal coefficient will act simultaneously. Primary stresses shall be maintained within the elastic limit of the material. Combined stresses of primary stress, secondary stress and local stress may reach the yield point, but excessive strain and deformation shall not occur.

Major Equipment Design Parameters

Outdoor Air Makeup and Containment Purge Equipment: HVE-1A and HVE-[illegible]

Fans - number:	2
Manufacturer:	Westinghouse
Air flow rate - per fan:	35,000 cfm
Power requirements - per fan:	75 hp
Heating coils - number:	3
Heating capacity - per unit:	2.27×10^6 Btu/hr
Steam [illegible] to coils - per unit:	2,[illegible] lb/hr
Prefilters - number:	36

4.0 **SYSTEM AND COMPONENT DESIGN** (Continued)

Local cooling units HVH-7A and HVH-7B

Manufacturer - Motor	Westinghouse
Manufacturer - Fan	H.K. Porter Co., Inc.
Air flow rate per unit	8,700 cfm
Total cooling capacity per unit	88,[illegible] Btu/hr
Cooling water flow rate per unit	[illegible]3 gpm
Power requirements - fan per unit	[illegible] hp

Local cooling units HVH-8A and HVH-8B

Manufacturer - Motor	Westinghouse
Manufacturer - Fan	H. K. Porter Co., Inc.
Air flow rate per unit	8,200 cfm
Cooling capacity per unit - Total	90,000 Btu/hr
Cooling water flow rate per unit	36 gpm
Power requirements - fan per unit	5 hp

Air return unit HV[illegible]

Manufacturer - Motor	Westinghouse
Manufacturer - Fan	American Standard Ind. Division
Air flow rate	4,800 cfm
Power requirements - fan	1 hp

Air exhaust units HVE-2A and HVE-2B

Manufacturer	Westinghouse
Air flow rate per fan	54,150 cfm
Power requirements - per fan	75 hp

Prefilters

Number	48

High efficiency particulate air (HEPA) filters

Number	48

4.0 SYSTEM AND COMPONENT DESIGN (Continued)

Air exhaust units HVE-5A and HVE-5B fans

Manufacturer - Motor	Westinghouse
Manufacturer - Fan	American Standard Ind. Division
Air flow rate per fan	5,750 cfm
Power requirements - per fan	5 hp

High efficiency particulate air (HEPA) filters

Number	6

Activated carbon bed filters

Number	18

Air exhaust units HVE-8A and HVE-8B

Manufacturer - Motor	Reliance Electric
Manufacturer - Fan	Buffalo Forge
Air flow rate per fan	308 cfm
Power requirements - fan	[illegible] hp

Air exhaust units HVE-17 and HVE-18

Manufacturer - Motor	Westinghouse
Manufacturer - Fan	American Standard Ind. Division
Air flow rate per fan	36,000/18,000 cfm (summer/winter)
Power requirements - fan	[illegible] hp

Electrical unit heater EUH-1

Heating capacity	17,100 Btu/hr
Power requirements - fan	1/80 hp
Power requirements - coil	5 kw

5.0 OPERATION (Continued)

5.6 Condensate Polisher

The Condensate Polisher HVAC System is manually operated as required. For detailed information on the operation of the system refer to OP-906: Heating, Ventilation, and Air Conditioning Operating Procedure.

5.7 Diesel Rooms

If a Diesel Generator is started, its ventilation system is automatically started. Fans may be started manually from the RTGB as required by plant conditions. For cooling of Diesel Room "A", HVS-6 and exhaust fan HVE-18 are started as required by plant conditions. For cooling of Diesel Room "B", HVS-5 and exhaust fan HVE-17 are started as required by plant conditions.

5.8 Turbine Building Service Area Supply and Exhaust

During normal operation, HVAC-1 will operate according to thermostat setting and HVE-13 will be operating continuously.

5.9 Hot Lab

HVA-3 is started by setting the thermostat located on the unit to the desired temperature, and pressing the START button.

5.10 Cold Lab

During normal operation, HP-1 will be operating continuously. The outdoor section (HP-1B) and EDH-1 operate automatically. The inlet air louver is open when the indoor section (HP-1A) is running.

5.11 Reactor Auxiliary Building Main Supply and Exhaust

EDH-2 is thermostat controlled from the Hot Lab. It operates whenever heating is required. HVE-7 operates continuously during normal plant operation. HVE-7 exhaust louver and HVS-1 return louver are opened and closed, respectively, and solenoid valve SW-787 is open if the outside air temperature is above 60°F.

5.0 OPERATION (Continued)

HVE-5A and HVE-5B are not operating during normal plant operation. These units can be started for the Recirc Phase of Safety Injection or as required by plant conditions to reduce possible airborne activity. When they are placed in service, the bypass damper shuts and the charcoal and absolute filters are activated. HVE-5A or HVE-5B may be started anytime HVE-2A or HVE-2B is running.

If HVE-2A/2B or HVE-5A/5B has an electrical trip, its respective standby fan starts for the tripped fan. If HVE-2A/2B or HVE-5A/5B has a low flow, its respective standby fan starts and trips out the running fan.

5.12 RHR Pit, SI, and AFW Pump Rooms

5.12.1 HVH-6A and HVH-6B

Both of these units will start automatically whenever any of the containment spray pumps or safety injection pumps start.

5.12.2 HVH-7A and HVH-7B

Both of these units will start automatically whenever either of the motor-driven auxiliary feedwater pumps start.

5.12.3 HVH-8A and HVH-8B

Both of these units will start automatically whenever either of the residual heat removal pumps start.

5.13 Electric Unit Heater EUH-1

EUH-1 will operate whenever the CCW Surge Tank Room temperature drops below the thermostat setting.