9.8 PLANT VENTILATING SYSTEMS

9.8.1 DESIGN BASIS

The plant ventilating systems are designed to provide a suitable environment for equipment and personnel with a maximum amount of safety and operating convenience. Potentially contaminated areas are separated from clean areas. Airflow patterns originate in areas of potentially low contamination and progress toward areas of higher activity. Generally, negative pressures are maintained in potentially contaminated areas and positive pressures in clean areas. The ventilating systems in the containment, waste processing and fuel-handling areas are designed for containment of radioactive particles. The path of the discharge from all potentially contaminated areas is directed into the respective plant vent where the radioactivity level is monitored. The equipment in most critical systems is redundant in character; detailed descriptions are presented where this occurs. Basic temperature design criteria are listed in Table 9-18.

9.8.2 SYSTEM DESCRIPTION AND OPERATION

9.8.2.1 General

The plant ventilation systems discussed in this section are shown on Figures 9-20A, 9-20B, and 9-21, and listed in Table 9-18.

The containment cooling and filtering systems are discussed in Sections 6.5 and 6.7, respectively. The penetration room ventilation system is discussed in Section 6.6.

9.8.2.2 Containment Ventilation

Control Element Assembly Drive Mechanism Cooling System

In this system, air is drawn from the containment at a rate of 800 cfm and design temperature of 120°F, through the reactor head cooling shroud and into two cooling coils of the CEDM cooler, which is located on the missile shield above the reactor. From there, 100% redundant fans discharge the cooled air upward into the containment again. Four ducts connect the shroud to the cooler coil house. One pair of ducts directs air to one cooling coil and the other pair supplies air to the opposite coil. Cooling water at a design inlet temperature of 95°F is pumped through the water-air coils. A power-operated damper located between each fan and the coil house prevents short-circuiting of air around the cooler when only one fan is operating. The switch-over from one fan to the other is accomplished by remote-manual control from the Control Room. Tests have shown this cooling air is more than adequate to maintain coil temperatures below 350°F. The airflow and geometrical cooling shroud configuration simulated that of the on-site installation. Testing of the CEDMs included holding, insertion, withdrawal and tripping operation.

In no case will loss of cooling air prevent the CEDM from releasing the CEAs if a reactor trip is initiated. Tests, in a simulated operating environment, have shown that the CEDM is capable of dropping the CEA after four hours of operation in the hold mode without cooling air supply. These heat transfer tests were conducted on a full-size prototype in a hot autoclave simulating reactor operation conditions.

Containment Purge System

There is a separate, identical purge system for each containment. In each system, an air-handling unit, located in the Auxiliary Building, supplies filtered and tempered air to the containment through a supply duct.

One exhaust fan for each Containment Structure, located in the Auxiliary Building, draws air from the containment through an exhaust duct and high efficiency particulate air (HEPA) filters, and discharges it into the respective main plant exhaust plenum where the fans force it into the plant vent. The air-operated butterfly valves, which fail closed, are located in the supply and exhaust ducts inside of containment to provide containment closure when the reactor is in a shutdown condition. During reactor operation, the purge penetrations are closed by a blind flange in each penetration outside of containment.

When the reactor is shut down, the containment purge isolation valves are closed and the purge system fans are stopped by a containment radiation signal.

During normal operations of the containment purge ventilation system, negative pressure is maintained in the Containment. Alternate line-ups may result in some natural air circulation in and out of Containment. Administrative procedures are in place to monitor and ensure that the potential release of radioactive particles from the Containment, while the purge air supply and exhaust fans are secured, will remain within the Offsite Dose Calculation Manual limits.

Containment Vent System

This system is designed to operate as a containment vent during power operations. The system is utilized to control containment pressure and airborne radioactivity within specified Technical Specification limits.

Upon receipt of a SIAS, containment radiation signal, or a high-radiation signal, the inboard and outboard MOVs close.

Although control of hydrogen in Containment following an accident is not required, this penetration may be used as a hydrogen purge.

Pressurizer Compartment Cooling

A metal wall, designed to blow out at less than 5 psi, separates the pressurizer compartment from the RCP area so as to prevent entrance of hot air from the pump motors into the compartment. In order to prevent the concrete upon which the pressurizer rests or pipe-mounted electrical components from overheating, cooling air is supplied at two levels from the containment coolers. In addition, air is supplied from the containment to the upper extremes of this compartment. The air supplied for cooling pressurizes this compartment and then exits through the access opening at Elevation 81'0".

Cavity Cooling System

Two redundant fans supply air from the containment air cooler plenum through ducting to the reactor cavity distribution manifold where it is used to cool the neutron detectors, the primary shield penetrations and the primary shield. System performance is adjusted by manual balancing. High efficiency filters are installed to protect each branch which serves a neutron detector.

9.8.2.3 Auxiliary Building Ventilating Systems

Control Room

The Control Room (Elevation 45'0") and the Cable Spreading Room (Elevation 27'0") are incorporated into a single year-round air-conditioning system serving both Units 1 and 2. Therefore, the ambient temperature in the Control Room is expected to be the same as the ambient temperature in the Cable Spreading

Room. Air handling and refrigeration equipment are redundant. The Control Room and Cable Spreading Room areas have a third source of cooling, which is not safety-related, in the form of a water chiller supplying a second set of coils in the safety-related air handling systems.

In the event that both the non-safety-related chiller and the safety-related condensers are rendered inoperable by a tornado, a post-tornado mode of cooling the Control Room and cable spreading rooms is available. In this mode of cooling, the fresh air dampers are fully opened, the recirculation dampers are fully closed, and the exhaust damper is fully opened to allow Control Room and cable spreading room cooling using outdoor air only.

The Control Room ventilation system continuously operates in the recirculation mode. The ventilation system is not designed to maintain the ventilated areas pressurized to a positive 1/8" water gauge pressure. If airborne contamination is detected, a high radiation signal (control room recirculation signal) from the recirculation air monitor will start the post-LOCI filter fans which will open their associated gravity discharge dampers, and close the toilet area exhaust duct damper. The post-LOCI filter fan unit inlet dampers are already in the open position. A Unit 1 SIAS A1 and Unit 2 SIAS B1 initiation signal was installed to augment the control room recirculation signal actuation. The SIAS initiation also starts the post-LOCI filter fans and opens their associated gravity discharge dampers, and secures the control room lavatory exhaust fan. Each post-LOCI filter unit is designed to process 10,000 ± 10% cfm of circulated air through HEPA and charcoal filters.

A separate exhaust fan is provided for the lavatory but, during the post-incident period when the air flow is in the complete recirculation mode, the lavatory exhaust is cut off automatically as described above.

All equipment except for ducting is remotely located so as to minimize the fire hazard.

The air conditioning system in this area is divided into three supply and return duct systems: one for each Cable Spreading Room and one for the Control Room. A portion of supply and return air is also routed to the Control Room heating, ventilation, and air conditioning (HVAC) equipment room. Each supply and return branch contains an isolation damper. Smoke detectors are located in the return duct from each zone.

In the event of a fire in one zone, the smoke detector automatically closes the corresponding isolation dampers. The air conditioning system continues to serve the other two zones without interruption.

With the isolation dampers closed, smoke can be evacuated from the isolated zone by means of an auxiliary fan. This fan is selectively connected to the return duct of any zone by operating motorized dampers in the auxiliary duct system. Air from the outside is allowed to enter the supply duct of the isolated zone by operating motorized dampers and manually opening the roof mounted hatch and damper. The operating panel for the motorized dampers and smoke removal fan is located just outside the Control Room entrance in the heater bay area.

<u>Control Room Habitability</u>

In accordance with TMI Item III.D.3.4, "Control Room Habitability," BGE committed to ensure Control Room Operators were adequately protected against the effects of accidental release of toxic and radioactive gases and that the nuclear power plant can be safely operated or shut down under design basis accident conditions. The NRC concluded that the Control Room habitability systems were acceptable, and that the systems provided safe, habitable conditions within the Control Room under both normal and accident radiation and toxic gas conditions, including LOCAs (Reference 1). This conclusion was predicated upon commitments to install a shield wall to prevent any streaming through the pipe chase into the Control Room from below, and to ensure sufficient self-contained breathing apparatus are available to the Control Room personnel to meet the requirements of Regulatory Guide 1.78.

Subsequently, BGE suspended the Control Room habitability thyroid dose calculation pending the issuance of revised source terms for the evaluation of Control Room habitability from the NRC. The NRC concurred with the adequacy of the associated interim compensatory measures (Reference 2) during this period.

Reference 3 approved the use of an alternative radiological source-term methodology for analyzing design basis accident radiological consequences. The analysis assumptions regarding operation of the Control Room ventilation system are discussed in Section 14. Associated plant modifications are discussed in the appropriate Updated Final Safety Analysis Report sections.

Battery Rooms

The battery rooms, located east of the Cable Spreading Room, are ventilated using air from the access control area. Separate supply and exhaust fans are utilized so as to maintain a negative pressure in these rooms with respect to the surrounding areas. The reserve battery room on Elevation 45'0" is also ventilated by the same supply and exhaust system.

Access Control Area

The access control area common to both plant units is located on Elevation 69'0" and 72'0", partly in the Auxiliary Building and partly in the Turbine Building. In 1984, the original access control area was renovated, and an expansion added in the Turbine Building portion. The access control area is now divided into "Clean" and "Controlled" zones. A separate HVAC system is provided for each zone.

The controlled zone includes hot laboratory, cold laboratory, frisker area, etc. No air is recirculated, all the air is conditioned, and a negative pressure is maintained in the controlled zone.

In the controlled zone, the air is supplied by Access Control HVAC RTU-1 and exhausted by access control exhaust Fans No. 11 and 12 through Unit 2 main exhaust plenum. Access Control HVAC RTU-1 provides filtered, tempered air to the controlled zone. It takes suction on outside air intake through redundant safety-related dampers and discharges air to rooms through duct work to the two gas bottle storage rooms, the hot laboratory, cold laboratory, counting room, clean room, frisker areas, clothing disposal area, and corridors 592 and 594. Note that the redundant safety-related dampers fail closed on a loss of power. A redundant set of radiation monitors will be installed which also allow the dampers to close.

The clean zone includes office, sign in/out, locker room, etc. Negative pressure is not necessarily maintained and the air is recirculated. The clean zone is heated, ventilated, and air conditioned by self-contained units. Access Control HVAC AHU-1 has safety-related dampers that fail closed on a loss of power. A redundant set of radiation monitors will be installed which also allow the dampers to close.

Main Steam Line Penetration Areas

Heat released by the main steam and feedwater pipes requires that cooling be provided all year round. One cooling and ventilating system is provided for each unit. This system uses outside air as the cooling medium.

Fresh air is mixed with recirculated air as required and supplied through ducting from an air-handling unit located on the floor at Elevation 27'0". The main steam line penetration area for each containment is pressurized and the excess air flows out through the open safety vent to the roof at Elevation 91'6". A room thermostat controls the position of the mixing dampers, which are located upstream of dust-stop filters.

Switchgear Rooms

Redundant and Seismic Category I HVAC and refrigeration systems are provided for each unit, with the exception that the pneumatic tubing is not Seismic Category I. Failure of the tubing does not affect safe shutdown of the plant. The equipment room for both is located on Elevation 69'0" and serves switchgear rooms for both units at Elevation 27'0" and 45'0". These rooms require cooling the year around. An "air conditioning" system supplies filtered air for ventilation and cooling at all times. The HVAC units and refrigeration components are redundant, but the supply and return ducts are not. High temperature air alarms annunciate in the Control Room to signal failure of the HVAC system. One alarm per room provides redundancy since both rooms are supplied by the same HVAC unit. If the unit fails, both rooms will heat up and provide an alarm. The inlet dampers fail open so that the rooms cannot become isolated.

The normal design and operating temperature of the Switchgear Room is 104°F. If both refrigeration units for a Switchgear Room fail, the fans can be arranged to supply 100% outside air to these rooms. The effect of purging with outside air can be evaluated by the operator and appropriate action taken.

Fairbanks Morse Diesel Generator Rooms

The Fairbanks Morse diesel generators are housed in three separate rooms located at Elevation 45'0" in the Auxiliary Building. Heat output from each generator is sufficiently high that cooling must be provided for both summer and winter. The ventilation system for this area is designed to limit room temperature to 120°F in summer and a minimum of 60°F in winter. Outside air is used as the cooling medium. An air-handling unit and mixing box-damper arrangement proportion the outside and recirculated air according to room temperature. When the diesel is running, its room is pressurized and the excess air is forced out through a weatherproof exhaust opening over the outside door. Hot water unit heaters maintain a minimum temperature of 60°F when the diesel is shut down.

Waste Processing Area Ventilation

A common air supply system consisting of three 50% capacity air handling units positioned on the west side of the Auxiliary Building at Elevation 69’0” supplies tempered air for ventilation of the common waste processing area. A system of ductwork ensures a uniform distribution throughout this area.

Separate exhaust systems for Units 1 and 2 draw air from their respective waste processing areas by means of ductwork and force it through HEPA filters, after which it is discharged into the main exhaust plenums provided for each unit. From here, the main plant exhaust fans force the air past the radioactivity monitors and out through the exhaust stacks. These exhaust fans are 100% redundant, but the filters are not.

Emergency Core Cooling Pump Room Ventilation

The ECCS pump rooms for Units 1 and 2 are served by the common waste processing area ventilation supply system. The ECCS pump room exhausts may be directed through HEPA filters prior to emptying into the main plant vent. When the ECCS pumps are operated post-accident, air flow from the ECCS pump room area may be diverted through the charcoal filters by manual remote actuation in the Control Room. However, the operation of this system and the resultant effects on offsite dose calculations are not credited in the accident analysis. This system provides defense-in-depth only.

Fan-coil coolers are installed in each ECCS pump room to provide additional cooling, if necessary, during pump operation.

Spent Fuel Pool Ventilation

An air supply system consisting of two 50% capacity air handling units, located at Elevation 86’0”, directly above the three supply units for the waste processing area, provides ventilation for the SFP area. Tempered outside air is supplied to one side of the SFP area at Elevation 69’0”. A separate exhaust system picks up air through a manifold, located on the opposite side of the pool, draws it through HEPA filters, and feeds it into the main plant vent of Unit 1. During movement of recently irradiated fuel assemblies, this air may be manually diverted by dampers into charcoal filters after it leaves the HEPA filter bank. Unit heaters are used to maintain a minimum temperature of 60°F in the winter.

The SFP Ventilation System is capable of maintaining a negative pressure with respect to surrounding areas of the building. The limitations placed on this system by the Technical Specifications ensure that, in the event of a fuel handling accident, involving recently irradiated fuel, all radioactive material released from a recently irradiated fuel assembly will be discharged to the atmosphere through the main plant vent. The operation of this system is consistent with the assumptions of the accident analyses.

Auxiliary Feedwater Pump Room

There are "normal" and "emergency" cooling systems used to cool the room. Identical systems are used for both Unit 1 and 2 pump rooms. (Refer to Section 6.9 for a description of the emergency mode of operation.) During normal plant operation, one operable self-contained HVAC unit is capable of maintaining the temperature in this room at 90°F or below. Air for ventilation is drawn in through redundant quick-close dampers from the Turbine Building and is forced out through ducting into the mechanical equipment room at Elevation 5'0" of the Auxiliary Building.

Decontamination Room

This system is intermittent in operation and has by necessity been appended to the normal ventilating system of the Unit 2 side of the Auxiliary Building at Elevation 5'0". While the decontamination room exhaust fan is running, the "normal" exhaust system from the tank rooms located at the west end of Unit 2 at this level, plus that from the decontamination room itself, is automatically interrupted by means of powered dampers.

By means of a fan located within this room, air is collected from three exhaust hoods which cover separate cleaning areas. It is drawn through a water-pad type scrubber and directed into the normal exhaust system of the Auxiliary Building at this level. Air is supplied by the normal ventilating system to the hallways and enters this room through the connecting passageways. Waste water from the scrubber is directed into the WPS.

Auxiliary Building Ventilation Charcoal Filters

Table 9-19 lists the Auxiliary Building charcoal filters, total flow rates and total charcoal weights. The charcoal is Barnebey-Cheney #727 (or equivalent) impregnated with 5 wt% iodine compounds. The flow velocity through the charcoal bed is 40 fpm in all cases and the corresponding residence time is 0.25 seconds. A typical charcoal filter module is 24-1/4"x25-3/4"x6-1/4". Each module is designed for an air flow of 333 cfm. Each filter housing contains sufficient modules for the total flow rates shown in Table 9-19. Filter testing is explained in Section 6.6.7.

Testing is performed to demonstrate that the installed charcoal adsorbers will perform satisfactorily in removing both elemental and organic iodides for design conditions of flow, temperature, and relative humidity. Periodic testing is conducted to ensure filter efficiencies credited in the accident analysis are maintained.

Diesel Generator Building HVAC System

The HVAC System for the safety-related Diesel Generator Building is divided into safety-related and non-safety-related portions. Two non-safety-related air handling units provide ventilation to the Diesel Generator Building. Air handling unit one (1A-AHU-1) provides ventilation to the Diesel Generator Building Control Room, Battery Room, 1E Switchgear Room, and non-1E Electrical Panel Room. Air handling unit two (1A-AHU-2) provides ventilation to the Maintenance Shop, hallway, Future Expansion Room, and Fuel Oil Storage Tank Room. The Diesel Generator Room is cooled by four safety-related fans when the emergency diesel is in operation and stand-by conditions. While the EDG is not in operation, a non-safety-related ventilation system provides cooling to the Diesel Generator Building Control Room, Battery Room, 1E Switchgear Room, and Non-1E Electrical Panel Room using a constant volume, direct expansion cooling air handler unit one (1A-AHU-1). These rooms are exhausted using a non-safety-related exhaust fan (1A-F-7), except for the battery room which uses a separate safety-related exhaust fan. However, during diesel generator operation, a safety-related supply and exhaust fan provides cooling using only outdoor ambient air. Both the non-safety-related air handling unit one and the safety-related supply and exhaust fan share a common section of the ductwork to supply and exhaust these rooms. Interlocks are provided to ensure that both the safety-related fan and the non-safety-related air handling unit do not operate at the same time. The HVAC system is designed to maintain the diesel generator room between 50º and 120ºF.

Station Blackout Diesel Generator Building HVAC System

The HVAC System for the Station Blackout Diesel Generator Building is designed to maintain the temperature in the Station Blackout Diesel Generator Building within the standards of manufacturers of equipment in the building. Four augmented-quality fans, each thermostatically controlled, are provided to exhaust air from the Diesel Generator Room. The Station Blackout Diesel Generator Building HVAC System also includes two augmented-quality air handling units to provide ventilation to the building. Air handling unit one (0C-AHU-1) supplies and exhaust conditioned air to the Control Room. Air handling unit two (0C-AHU-2) provides cooling using outside ambient air to provide ventilation to the Fuel Tank Room, Switchgear Room, Diesel Generator Room, Battery Room, and Cable Spreading Area. The Cable Spreading Area, Diesel Generator Room and the Fuel Tank Room are exhausted using an augmented quality exhaust fan (0C-F-6). However, the Battery Room has a separate augmented quality exhaust fan (0C-F-5).

9.8.2.4 Turbine Building

When Units 1 and 2 are both in operation, the Turbine Building requires cooling all year round. Outside air is used for this purpose since it will normally be at least 15 degrees below the Turbine Building maximum design air temperature. Twelve fans, one in each vertical air shaft at Elevation 95'0", supply air from mixing boxes through ducting to all levels of the Turbine Building and heater bay area. The selection of fresh air or recirculated air, which is accomplished by means of dampers located in the mixing box, is manually controlled for each fan by a switch located on the operating floor level. The walls of the vertical shafts are louvered above the fan level, thus permitting them to serve as an intake plenum. All Turbine Building ventilating fans are manually controlled. Plant operations personnel determine the number in operation at any one time.

Exhaust dampers located near the center of each horizontal air shaft are blocked open except as follows.

Horizontal air shafts 3 and 4 (two in center) have two exhaust fans mounted in each shaft in place of the relief dampers to exhaust approximately 80% of the air supplied by the intake fans. The fans are manually controlled. The four exhaust dampers adjacent to these four exhaust fans are blocked shut to prevent exhaust flow back into the building.

A mechanical cooling system is installed to provide local cooling at the four heater drain pump motor locations. Four fan coil units, located on Elevation 27' above each pump motor, are supplied chilled water from two air-cooled water chillers located at the north end of the Turbine Building. Air from the fan units is directed downward over the pump motors by removable ductwork. The fans are manually controlled. The chillers have self-contained controls and are turned on by flow switches in the chilled water lines. The chilled water pump is manually controlled.

Hot water unit heaters maintain a minimum temperature of 60°F at the operating floor level during a shutdown period. Unit heater fans are controlled by thermostats located on the operating floor level.

9.8.2.5 Service Building

The administrative area of the service building is air-conditioned all year round. All administration area rooms have individual temperature control.

The warehouse and shop areas at Elevation 45'0" are ventilated all year round by a single makeup-air unit. The unit provides both mechanical cooling and electric heat for year round operation. Unit heaters supplement the makeup air unit to maintain 60°F minimum in the winter time. Room thermostats control the operation of the unit heater fans. The lower levels of the service building are ventilated only with fresh air being tempered to 60°F. The two 250 Volt battery rooms (Elevations 12' and 35') are cooled with separate mechanical refrigeration cooling systems.

9.8.2.6 Intake Structure

The amount of heat generated by the saltwater and circulating water pump motors in the intake structure is such that a cooling system is necessary year round. Six air supply units consisting of weather louvers and filter modules capable of high moisture separation efficiency, and a supply fan are located on the six saltwater pump hatches. These supply units force fresh air into the intake structure. Room thermostats control the fans' motors. After absorbing the heat from the saltwater pump motors and the circulating water pump motors, the air exits the intake structure through exhaust vents located on the twelve circulating water pump hatches. These exhaust vents consist of weather louvers capable of high moisture separation efficiency. This system limits the intake structure ambient temperature to approximately 104°F when the outdoor ambient temperature is 95°F. A minimum amount of outside air for ventilation enters through ducts at six locations and is exhausted through ducts by two fans located in the east wall of the service building. Hot water unit heaters prevent freeze-up during periods of complete shut down.

If these air supply units were to fail, the increase in temperature could cause the circulating water pump motors to overheat. Therefore, an over-temperature light and alarm are incorporated into the control board located in the Control Room.

The six fan units in the Intake Structure are not required for continuous satisfactory operation of two saltwater pumps per unit. Natural air circulation, cooling effect from the Intake Structure walls and cooling from the saltwater piping will provide sufficient heat removal for the saltwater pump motors.

9.8.3 CODES AND STANDARDS

The work, equipment and materials conform to the requirements and recommendations of the following codes and standards, as applicable:

National Fire Protection Association Code, Pamphlet 90A
National Electric Code
American Society of Heating, Refrigerating and Air-Conditioning Engineers Guides
Air Moving and Conditioning Association, Inc.
American Society of Mechanical Engineers
Sheet Metal and Air-Conditioning Contractors National Association, Inc.
American Society of Testing Materials

9.8.4 TESTS AND INSPECTIONS

All equipment is accessible for inspection. Testing and performance-indicating instruments are built into each critical apparatus to increase the maintainability and reliability of these systems. Where redundant equipment is provided, it will be operated alternately to provide increased assurance of operability (as required by the Technical Specifications).

In addition, the filters (HEPA and charcoal) are subjected to testing similar to that of the Containment Iodine Removal System filters described in Section 6.7.

9.8.5 REFERENCES

1. Letter from R. A. Clark (NRC) to A. E. Lundvall, Jr. (BGE), dated September 3, 1982, Review of NUREG-0737 Item III.D.3.4, Control Room Habitability
2. Letter from D. G. McDonald, Jr. (NRC) to R. E. Denton (BGE), dated June 22, 1995, Control Room Habitability Interim Analysis for Thyroid Dose
3. Letter from D. V. Pickett (NRC) to J. A. Spina (CCNPP), dated August 29, 2007, Amendment re: Implementation of Alternative Radiological Source Term

TABLE 9-18

PLANT VENTILATION SYSTEM DESIGN CONDITIONS

SYSTEM	**TYPE SYSTEM**[c]	**SUMMER (°F) INSIDE**	**SUMMER (°F) OUTSIDE**	**WINTER (°F) INSIDE**	**WINTER (°F) OUTSIDE**	**MAIN PLANT VENT FLOW CAPABILITY UNIT 1 (cfm)**	**MAIN PLANT VENT FLOW CAPABILITY UNIT 2 (cfm)**
Turbine Building	HV	110	95[i]	60	0		
Containment Cooling	AC	120	95[i]	60	0		
Pressurizer Compartment	AC	NA	NA	NA	NA		
Cavity Cooling	AC	NA	NA	NA	NA		
CEDM Cooling	AC	NA	NA	NA	NA		
Purge System[a]	V	NA	NA	60, 45[j]	0	50,000	50,000
Pipe Penetration Rooms[b]	V	130	NA	NA	NA	2,000	2,000
Auxiliary Building							
Auxiliary Feedwater Pump Room	HVAC	90	NA	NA	NA		
Control Room	HVAC	75	95[i]	75	0		
Cable Room	HVAC	90	95[i]	75	0		
Access Control Area						NA	13,900
Health Physicist	HVAC	75	95[i]	75	0		
Hot Laboratory	HVAC	75	95[i]	75	0		
Other Controlled Rooms	HV	NA	NA	75	0		
Clean Rooms	HV	NA	NA	75	0		
Main Steam Pen. Areas	V	160	95[i]	60	0		
Switchgear Rooms	HVAC	104	95[i]	104	0		
Diesel Generator Rooms	HV	120	95[i]	60	0		
Spent Fuel Pool	HV	110	95[i]	60	0	32,000	NA
Radwaste Area	HV	110	95[i]	60	0	49,500	49,500
ECCS Pump Room	HVAC	110	95[i]	60	0	3,000	3,000
Intake Structure	HVAC	104	95[i]	104	0		
Service Building							
Office Area	HVAC	75	95[i]	75	0		
Locker Room	HV	NA	95[i]	80	0		
Warehouse	HV	110	95[i]	60	0		
Shop	HV	110	95[i]	60	0		

TABLE 9-18

PLANT VENTILATION SYSTEM DESIGN CONDITIONS

SYSTEM	TYPE SYSTEM[c]	SUMMER (°F) INSIDE	SUMMER (°F) OUTSIDE	WINTER (°F) INSIDE	WINTER (°F) OUTSIDE	MAIN PLANT VENT FLOW CAPABILITY UNIT 1 (cfm)	MAIN PLANT VENT FLOW CAPABILITY UNIT 2 (cfm)
EDG 1A Building							
Battery Room	HVAC	104	95[i]	69	0		
1E Switchgear Room	HVAC	104	95[i]	50[e]	0		
EDG Building Control Room	HVAC	104	95[i]	50	0		
Non-1E Electrical Panel Room	HVAC,V	104	95[i]	50[e][h]	0		
EDG Fan Room	H,V	120	95[i]	50	0		
All Other Rooms Below 3rd Floor	HV	120[d]	95[f,i]	50[e]	0		
Third Floor	V	104[f]	95[i]	0	0		
						136,500	118,400

(a) In operation only when containment is occupied

(b) Operated intermittently as required and during LOCA

(c) H = Heating only
V = Ventilation only
AC = Air Conditioning (cooling) only

(d) The hallway, Maintenance Shop, and Future Expansion Room may reach a maximum temperature of 150°F when the diesel is in operation.

(e) Minimum temperature may be lower in the 1E Switchgear Room, Fuel Oil Storage Tank Room, hallway, Non-1E Panel Room, Maintenance Shop, and the Future Expansion Room during diesel operation under accident conditions concurrent with design basis winter temperatures.

(f) Downstream of the radiators on the third floor, the maximum design temperature may reach 140°F during diesel operation.

(g) Deleted.

(h) 1E Switchgear Room and Non-1E Electrical Panel Room may experience temperatures no lower than 32°F during accident conditions with design basis outside temperatures.

(i) These temperatures reflect the ventilation or AC system design temperature (95°F dry bulb), as recommended in the American Society of Heating Refrigeration and Air Conditioning Engineers Guide of regional design conditions.

(j) Applicable only when Unit 1(2) is in Mode 5 or 6. When defueled, applicable with an RCS vent path of at least 8 in^2 available.

TABLE 9-19

AUXILIARY BUILDING VENTILATION CHARCOAL FILTERS

FILTER NAME AND LOCATION	FLOW RATE (cfm)	APPROX. WT OF CHARCOAL (lbs)
Spent Fuel Pool #11	32,000	4,224
Penetration Room Exh. #11[a]	2,000	264
Penetration Room Exh. #12[a]	2,000	264
Penetration Room Exh. #21[a]	2,000	264
Penetration Room Exh. #22[a]	2,000	264
ECCS Pump Room Exh. #11	3,000	396
ECCS Pump Room Exh. #21	3,000	396
Post-LOCI #11 (Control Room)[a]	10,000	1,500
Post-LOCI #12 (Control Room)[a]	10,000	1,500

[a] These charcoal filter units are tested in accordance with Technical Specification 5.5.11, Ventilation Filter Testing Program.