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Subject: **Response to Portion of NRC Request for Additional Information Letter No. 103 Related to ESBWR Design Certification Application - Heating, Ventilation, and Air Conditioning - RAI Numbers 9.4-40, 9.4-41, 9.4-44, 9.4-45, and 9.4-46**

The purpose of this letter is to submit the GE Hitachi Nuclear Energy (GEH) response to the U.S. Nuclear Regulatory Commission (NRC) Request for Additional Information (RAI) sent by NRC letter dated July 23, 2007. GEH response to RAI Numbers 9.4-40, 9.4-41, 9.4-44, 9.4-45, and 9.4-46 are addressed in Enclosure 1.

If you have any questions or require additional information, please contact me.

Sincerely,

James C. Kinsey
Vice President, ESBWR Licensing

D068
LRO

Reference:

1. MFN 07-414, Letter from U.S. Nuclear Regulatory Commission to Robert E. Brown, Senior Vice President, Regulatory Affairs, *Request For Additional Information Letter No. 103 Related To ESBWR Design Certification Application*, dated July 23, 2007

Enclosure:

1. Response to Portion of NRC Request for Additional Information Letter No. 103 Related to ESBWR Design Certification Application – Heating, Ventilation, and Air Conditioning – RAI Numbers 9.4-40, 9.4-41, 9.4-44, 9.4-45, and 9.4-46

cc: AE Cabbage USNRC (with enclosure)
GB Stramback GEH/San Jose (with enclosure)
RE Brown GEH/Wilmington (with enclosure)
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ENCLOSURE 1

MFN 07-593

Partial Response to RAI Letter No 103 Related to ESBWR

Design Certification Application

Heating, Ventilation, and Air Conditioning Systems

RAI Numbers 9.4-40, 9.4-41, 9.4-44, 9.4-45, and 9.4-46

NRC RAI 9.4-40

DCD, Tier 2, Revision 3, Figure 9.4-8 shows two (2) filter units for the Turbine Building Exhaust (TBE) system whereas Table 9.4-15 states there are five (5) filter units.

Please show all five filter units on the figure or show one filter unit with a note saying that it is typical of 5 units. Please verify that the nomenclature between the figure, table, and text are consistent.

GEH Response

The Turbine Building Exhaust (TBE) system design has been changed and the filter units have been removed.

DCD Tier 2 Subsection 9.4.4, Table 9.4-15 and Figure 9.4-8 have been revised in Revision 4 and there is consistent nomenclature between all.

DCD Impact

No DCD change will be made in response to this RAI.

NRC RAI 9.4-41

DCD Tier 2, Revision 3, Table 9.4-10 states there are four (4) safety-related isolation dampers for the Reactor Building Refueling and Pool Area HVAC Subsystem (REPAVS). Figure 9.4-11 (a simplified diagram) only shows two (2) building isolation dampers.

Please show all four of the safety-related dampers on the figure and mark them as safety-related.

GEH Response

DCD Tier 2 Figure 9.4-11 was revised in Revision 4 to ensure Figure 9.4-11 is consistent with Table 9.4-10. Two additional dampers were added to Figure 9.4-11. Since Figure 9.4-11 is a Simplified System Diagram the safety-related designation is not shown on the figure, however, Table 9.4-10 identifies the Building Isolation Dampers as safety-related.

DCD Impact

No DCD change will be made in response to this RAI.

NRC RAI 9.4-44

DCD, Tier 2, Revision 3, Table 9.4-11 states there are four (4) safety-related isolation dampers for the Reactor Building Contaminated Area HVAC Subsystem (CONAVS). Figure 9.4-10 (a simplified diagram) only shows two (2) building isolation dampers. Please show all four of the safety-related dampers on the figure and mark them as safety-related.

GEH Response

DCD Tier 2 Figure 9.4-10 has been revised in Revision 4 to include the requested dampers. Since Figure 9.4-10 is a Simplified System Diagram the safety-related designation is not shown on the figure, however, Table 9.4-11 identifies the Building Isolation Dampers as safety-related.

DCD Impact

No DCD change will be made in response to this RAI.

NRC RAI 9.4-45

DCD, Tier 2, Revision 3, Table 9.4-11 lists a Main Steam Tunnel AHU, Recirculation AHU and a Refueling Machine Control Room Recirculation AHU as part of the CONAVS equipment.

- A. Please identify these items on the Figure 9.4-10 with respect to other CONAVS equipment.*
- B. The Main Steam Tunnel AHU's are located in the Turbine Building. Are there safety-related dampers for isolation at the Reactor Building interface? Include them on the appropriate diagrams and equipment list.*
- C. The CONAVS AHU's are located in the Fuel Handling Building. Are there safety-related dampers at the building interface? Include them on the appropriate diagrams and equipment list.*

GEH Response

A/B. The Main Steam Tunnel is an open space that connects directly (without air flow restrictions) to the Turbine Building, so there are no safety-related dampers because there is no physical interface between both buildings except for the seismic restraint structure (see DCD Tier 2 Figures 1.2-7, 1.2-10, 1.2-15 and 1.2-20 (room 1770 in the Reactor Building side, room 4393 in the Turbine Building side)). The walls, ceiling and floor of the Main Steam Tunnel provide the boundary between the Reactor Building and the Turbine Building. The Main Steam Tunnel HVAC equipment will be included in DCD Tier 2 Figure 9.4-10. The Refueling Machine Control Room Recirculation equipment will not be included because small equipment is not shown on the system schematic representation.

C. CONAVS has four safety-related isolation dampers at the building interfaces: two in the supply duct (Reactor Building – Fuel Building HVAC Penthouse) and two in the exhaust duct (Reactor Building – Plant Vent Stack). These four building isolation dampers are addressed in DCD Tier 2 Table 9.4-11 and Figure 9.4-10.

DCD Impact

DCD Tier 2 Figure 9.4-10 will be revised in the Revision 5, to identify the Main Steam Tunnel Recirculation AHU, as indicated on the attached markup.

NRC RAI 9.4-46

DCD, Tier 2, Revision 3, Figure 9.4-9 indicates that the smoke purge is exhausted directly to the environment.

Include the building isolation dampers and note if they are safety-related in Figure 9.4-9. Since the smoke exhaust could be from contaminated areas, is there any provision to monitor for radioactive release?

GEH Response

It is assumed that fire only affects one fire-area. Therefore the Reactor Building Clean Area HVAC Subsystem (CLAVS) remains in operation except for in the affected fire area. See Revision 4 DCD Tier 2 Appendix 9A for fire area details.

If smoke is detected in rooms served by the CLAVS the smoke exhaust fans extract smoke-air only from the affected rooms, which are clean rooms. Therefore, monitoring for radioactive release is not required. The CLAVS smoke exhaust subsystem is not designed to exhaust smoke from contaminated areas. Since Figure 9.4-9 is a Simplified System Diagram the safety-related designation is not shown on the figure, however, Table 9.4-9 does not show that the Building Isolation Dampers are safety-related. Figure 9.4-9 will be revised to show the building isolation dampers. Table 9.4-9 will be revised to show the CLAVS isolation dampers.

DCD Impact

DCD Tier 2 Figure 9.4-9 and Table 9.4-9 will be revised in Revision 5, to include the building isolation dampers, as indicated on the attached markups.

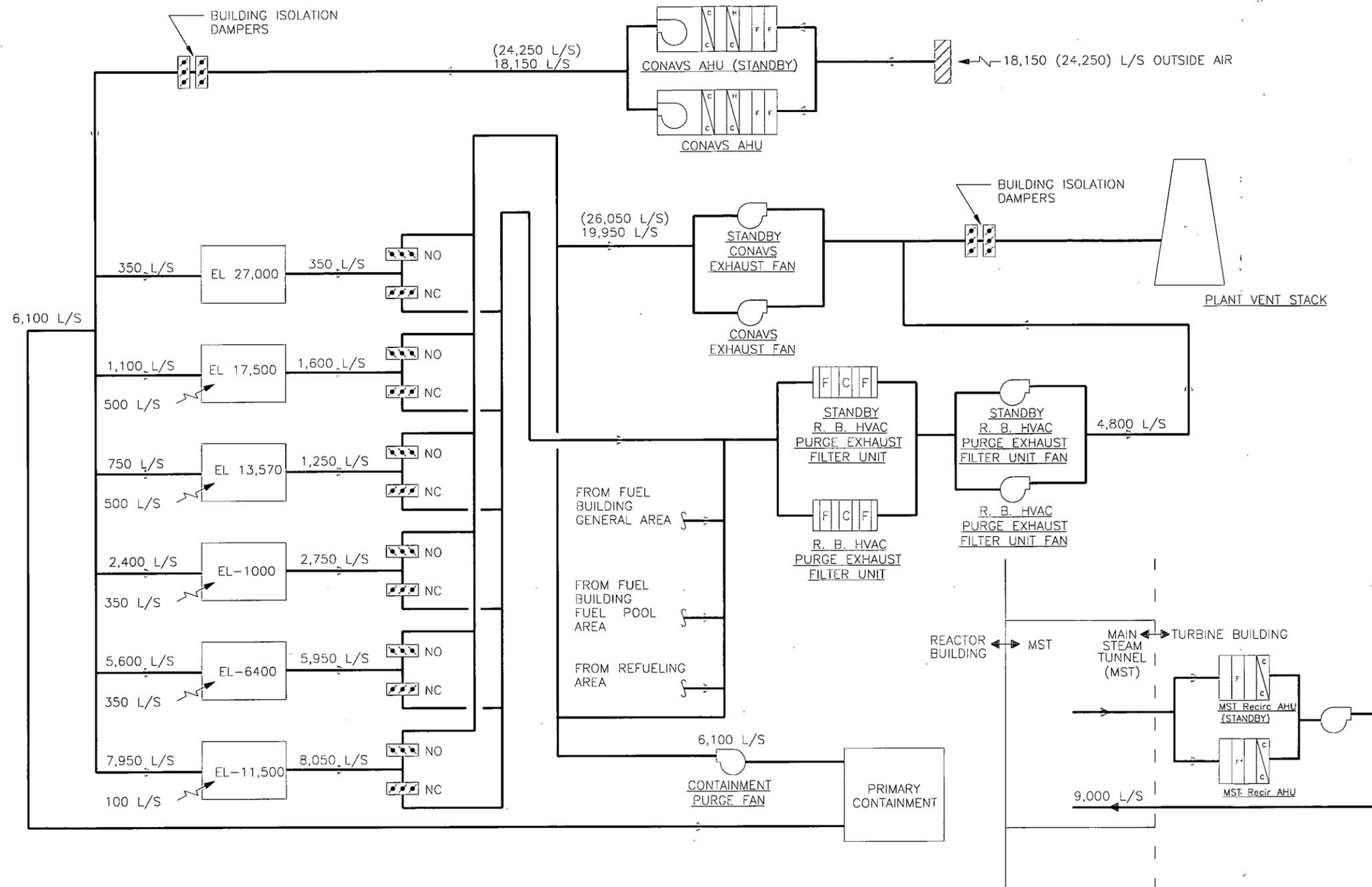


Figure 9.4-10 CONAVS Simplified System Diagram

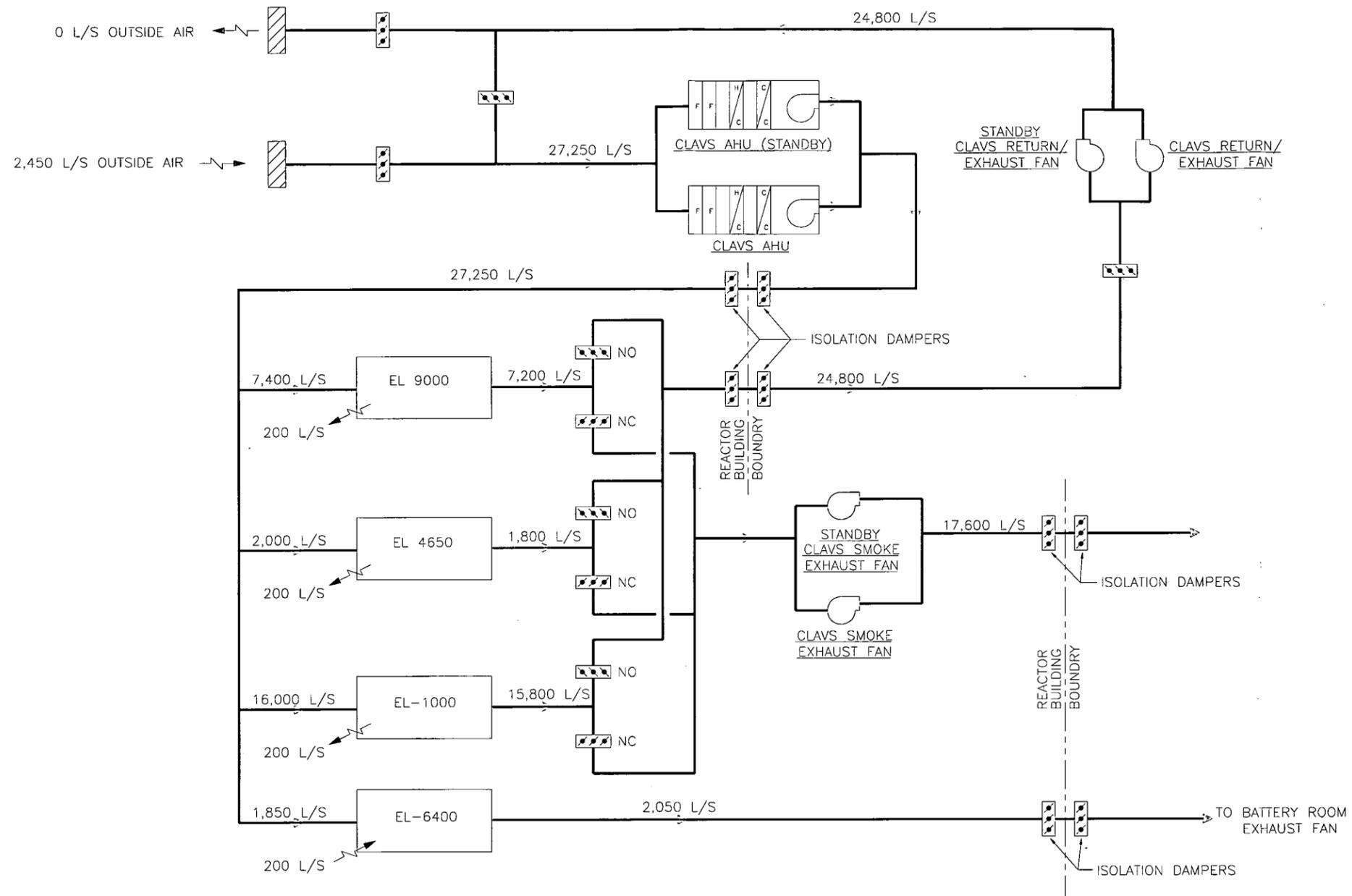


Figure 9.4-9 CLAVS Simplified System Diagram

Table 9.4-9
Major Equipment for CLAVS

Supply air handling units	Quantity:	2 - 100% capacity (one running and one standby)
	Capacity:	Normal flow – 27,250 l/s (57,739 cfm) per unit
		Filtration - medium efficiency
		Cooling – approximately 686,400 watts (2,344,203 Btu/hr)
		Heating – approximately 100,500 watts (343,406 Btu/hr)
AHU Supply fans	Quantity:	2 - 100% capacity (one running and one standby)
	Capacity:	Normal flow - 27,250 l/s (57,739 cfm) per fan
	Type:	Centrifugal or Axial with variable inlet vanes or Variable Speed Drive, approximately 75 kW (100 hp)
Return/exhaust fans	Quantity:	2 - 100% capacity (one running and one standby)
	Capacity:	Flow – 24,800 l/s (52,548 cfm) per fan
	Type:	Centrifugal or Axial with variable inlet vanes or Variable Speed Drive, approximately 30 kW (40 hp)
Smoke exhaust fans	Quantity:	2 - 100% capacity (both standby)
	Capacity:	Flow – 17,600 l/s (37,292 cfm) per fan
	Type:	Centrifugal or Axial with Variable Speed Drive or with inlet vanes, approximately 18.6 kW (25 hp)
Battery Room exhaust fan	Quantity:	2 - 100% capacity (one running and one standby)
	Capacity:	Flow – 2,050 l/s (4,345 cfm) per fan
	Type:	Centrifugal or Axial with Variable Speed Drive or with inlet vanes, approximately 2.2 kW (3 hp)
Building Isolation Dampers	Quantity:	4 (2 redundant dampers for each CLAVS supply and exhaust duct) 4 (2 redundant dampers for each CLAVS Smoke and Battery Room Exhaust Fans/Ducts)
	ASME AG-1 SeatLeakage Class	1 – Low Leakage
	Actuator Type	Pneumatic, fail close