HVAC SYSTEM

U/nu
C.M. Pascau
8-31-2010

U/NU
G.S.Petersen
xxx

BREAK DOWN OF HVAC SYSTEM

Area	Type of Ventilation	Phase	Safety Classification	Operation Criteria
KIS (Existing)	Confinement	N/A	SS	Independent for Phase 1, then combined with phase 2
S & P (New)	Confinement	1A	SS	Independent for Phase 1, then combined with phase 2
PDC (New)	Confinement	2	SC	Integrated system with all areas in operation in Phase 2
MS (New)	Non-Confinement	1B	PS	Independently operates

General Requirements for HVAC Systems

- Provide Safety Class tertiary confinement of airborne radioactive particulate releases for design basis accidents to protect the public.
- Provide Safety Significant primary confinement of airborne radioactive particulate releases for design basis accidents to protect the workers.
- Control contamination within the facility
- Condition air to Process Facility (Heat, Cool, Dehumidify and Filter)

Provide Safety Class Tertiary Confinement for Public Protection (Phase II PDC Process Area)

- Maintain Pu Processing Bldg at a negative pressure during and following design basis events
- Maintain Pu Processing Bldg negative pressure with 2 of 4 safety class exhaust fans operating
- Provide filtration with a minimum efficiency of 99.51 % for radioactive particulates with a mean diameter of 0.7 micron during and following design basis events
- Interlock and sequence inlet bypass and isolation dampers to prevent potential for an unfiltered backflow release
- Meet design criteria for PC-3 natural phenomena

Provide Safety Significant Primary Confinement for Worker Protection (PDC/S &P)

- Maintain a negative pressure relative to the room within process gloveboxes, interim storage, and the internal transport enclosures during and following design basis events
- Provide a safety significant preferential flow path to the tertiary ventilation plenum/tunnel leading to the sand filter
- Automatically maintain a minimum 125 fpm face velocity for a maximum credible breach of a 15-inch diameter bag port or two glove ports.
- Meet design criteria for a PC-2 seismic event

Contain Hazardous Materials in the Facility

- Configure air to flow from tertiary to secondary to primary zones
- Maintain Glovebox negative pressure during
  - Normal Operation
  - Upset conditions: 125 FPM inflow through a credible breach
- Maintain Hood Face Velocity of 125 +/- 25 FPM

Control Contamination Within the Facility

- Maintain Zone Differential Pressures (SRS Std. 15889,5.4.1)
  - Tertiary (Zone 3)/Atmosphere: -0.1” to -0.15” w.g.
  - Secondary (Zone 2)/Tertiary (Zone 3):-0.1” to -0.15” w.g.
  - Glovebox (Zone 1) to Zone 2: -0.7” to -1.0” w.g. (air)
  - Glovebox (Zone 1) to Zone 2: -0.5” to -1.5” w.g. (inert)
- Provide HEPA Filter at Glovebox and Hood Outlets to prevent contamination of ductwork (SRS Std. 15889,5.1.6.7 and 5.1.7.7)
- Provide dump valve control to assure minimum of 125 FPM velocity through a credible breach (SRS Std. 15889,5.1.6.8)
- Maintain Hood Face Velocity of 125 +/- 25 FPM (SRS Std. 15889,5.1.7.1)

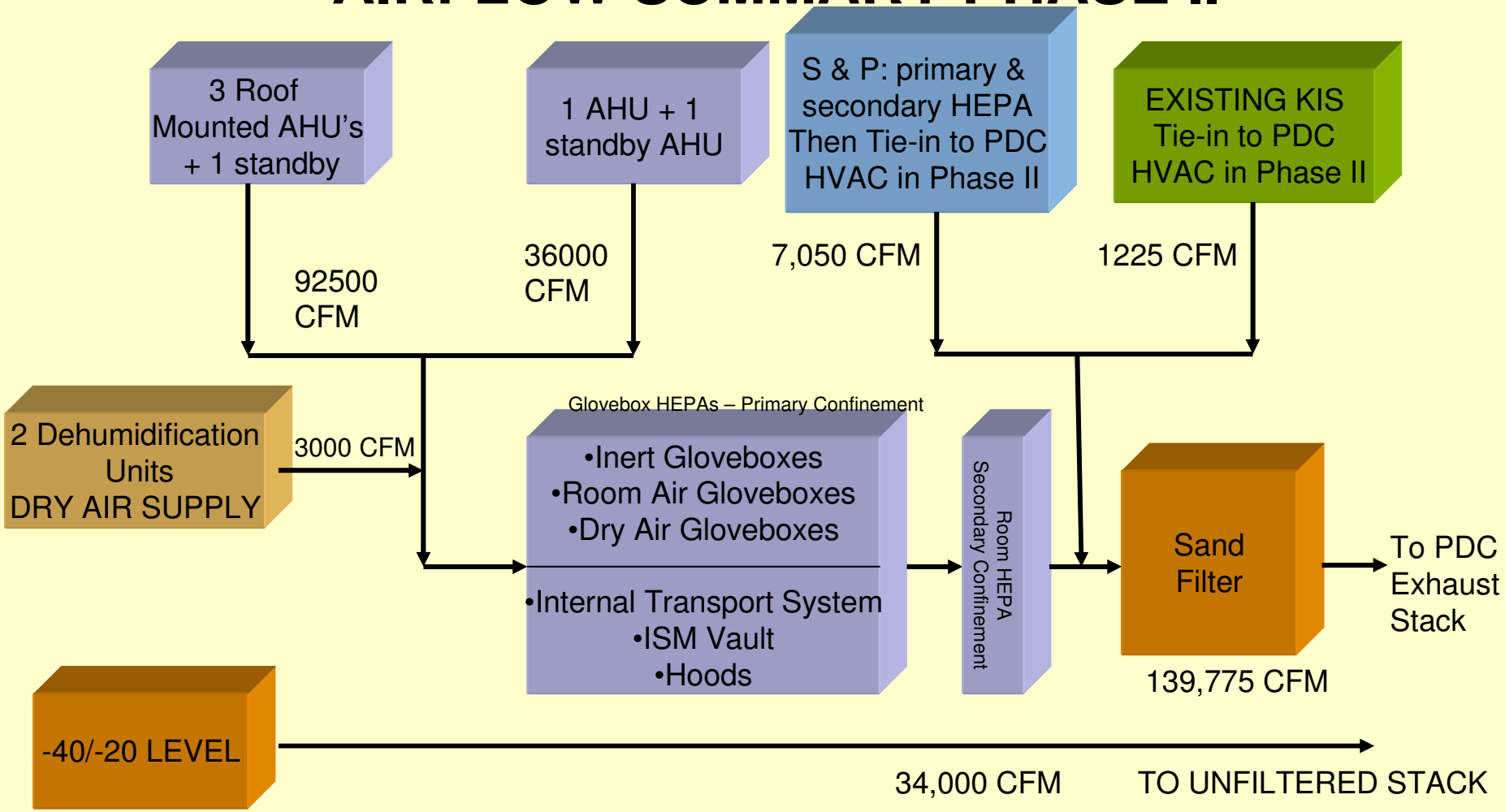
Maintain Contamination to Acceptable Limits

- Maintain minimum air flow for dilution in confinement zones under normal operation (SRS Std. 15889,5.2.2)
  - Primary Confinement, Gloveboxes (Zone 1): 10 Air Changes per Hour (SRS Std. 15889,5.1.6.3 and 5.8.1)
  - Secondary Confinement (Zone 2): 8 Air Changes per Hour (SRS Std. 15889,5.8.1)
  - Tertiary Confinement (Zone 3): 4 Air Changes per Hour (SRS Std. 15889,5.8.1)

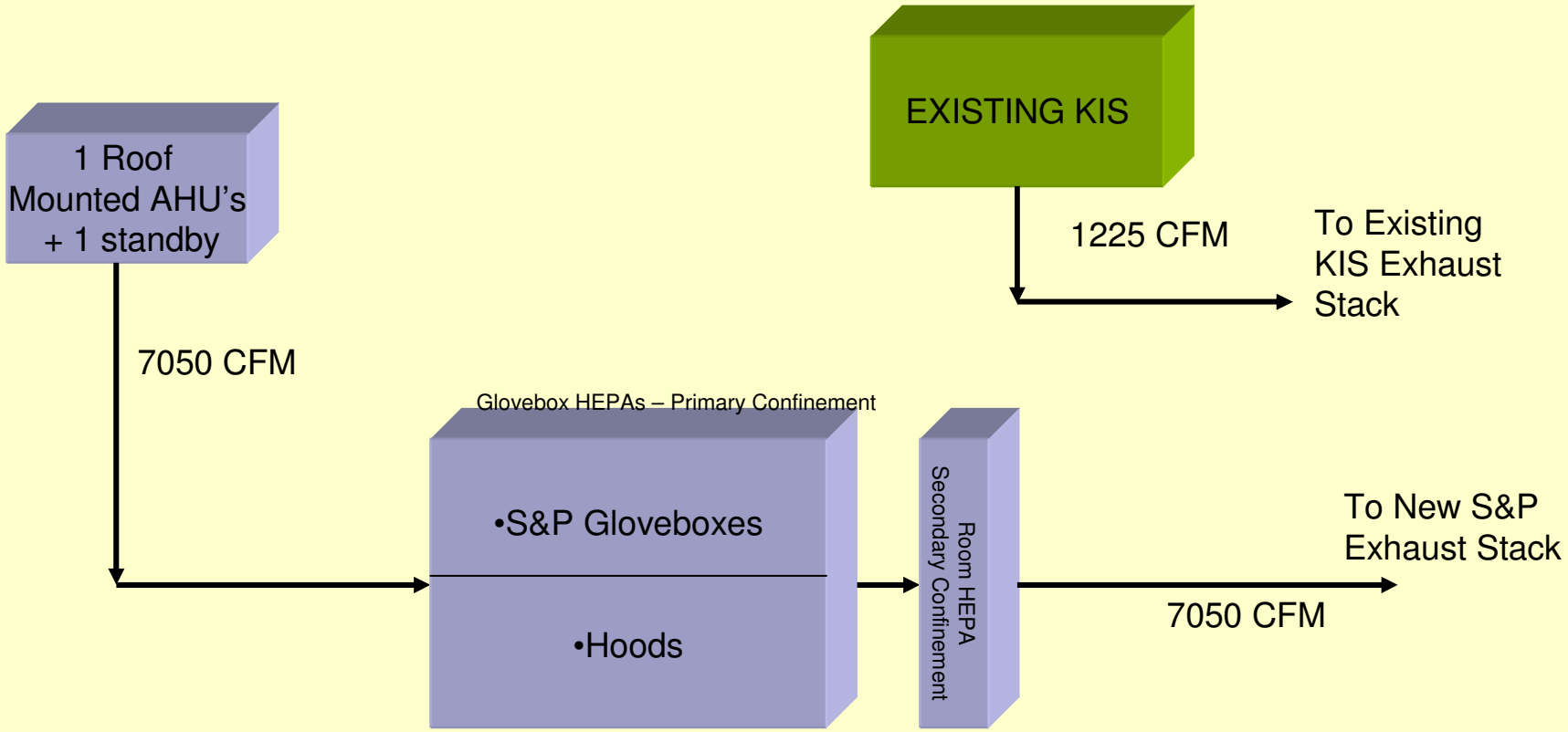
Condition Air to Process Facility

- Heating and Cooling of Zones 2 and 3
  - Normal Operation: Maintain comfort conditions (SRS Std. 15889,5.8.2.6)
  - Upset w/ standby power: Reduced heating and cooling capacity
  - Emergency (safety class mode): No Heating or cooling
- Heating and Cooling Zone 1
  - Room Air and Dry Air Gloveboxes: Maximum sustained glovebox skin temperature of 93 deg. F (SRS Std. 15889,5.1.6.4) Provide greater than 10 Air Changes per hour if necessary.
  - Dry Air Gloveboxes: Provide minus 30 deg F dew point air during normal mode and standby power upset mode
  - Filter supply air: Minimum Efficiency Reporting Value-MERV 7 &14(25-30% and 90-95%) (SRS Std. 15889,5.6.13)

AIRFLOW SUMMARY PHASE II



AIRFLOW SUMMARY PHASE I



Aerial View of HVAC Equipment