

**Mixed Oxide Fuel Fabrication Facility
Confinement System Requests for Additional Information**

CONF-1 LA Section 11.3, p. 11.3-1

Provide a rationale for only committing to Sections C.1.a, C.1.b, and C.1.c of Regulatory Guide 3.12, "General Design Guide for the Ventilation System of Plutonium Processing and Fuel Preparation Plants."

Section 11.4.5.1 of NUREG-1718, "Standard Review Plan (SRP) for the Review of an Application for a Mixed Oxide (MOX) Fuel Fabrication Facility," cites Regulatory Guide 3.12 as applicable guidance for ventilation systems for a MOX facility. Section 11.3 of the Mixed Oxide Fuel Fabrication Facility (MFFF) License Application (LA) states that design of the ventilation and confinement systems is consistent with Sections C.1.a, C.1.b, and C.1.c of Regulatory Guide 3.12. However, the other subsections in Section C, "Regulatory Position," of Regulatory Guide 3.12 are not cited. It appears that virtually all of Section C, "Regulatory Position," of Regulatory Guide 3.12 should apply to the MFFF.

CONF-2 LA Section 11.3, p. 11.3-3, and Figure 11.3-3

Clarify where the second level supply filter stages are located for the C4 confinement zone.

Discussion is "Official Use Only – Security Related Information"

The regulations in 10 CFR 70.22(a) (7) require that the applicant provide a description of equipment and facilities that will be used to protect health and minimize danger to life or property.

CONF-3 LA Section 11.3, General

For each level of High Efficiency Particulate Air (HEPA) filtration in the supply and exhaust stages, state whether the HEPA filters will be in-place tested to ensure that installation has been performed properly, what the leak test criteria will be, what testing standards will be used, what standards will be used to locate testing ports, and whether the HEPA filters are credited during routine operation, criticality prevention, and accidents.

The ventilation filtration system utilizes several levels of HEPA filtration, but does not present information on what HEPAs will be tested, what the test standards and criteria will be, how testing ports will be located, and what HEPAs will be credited during routine and accident conditions.

Information regarding testing of the ventilation system should be included in the application in accordance with the Section 11.4.5 (B) of the Standard Review Plan for the Review of an Application for a Mixed Oxide Fuel Fabrication Facility (SRP), NUREG-1718.

CONF-4 LA Section 11.3.1.2, p. 11.3-8

Explain what the “other protective measures” are that are used to protect the glove boxes from pneumatic transfer system over- and under-pressure.

Discussion is “Official Use Only – Security Related Information”

Information regarding the ventilation system should be included in the application in accordance with the Section 11.4.5 (A) of the SRP.

CONF-5 LA Section 11.3.1.2, p. 11.3-8

Explain why glove box dump valves are not sized to be redundant.

Discussion is “Official Use Only – Security Related Information”

Information regarding the ventilation system should be included in the application in accordance with the Section 11.4.5 (C) of the SRP.

CONF-6 LA Section 11.3.1.2, p. 11.3-8

Provide the following information on the Very High Depressurization (VHD) system ductwork:

- a. What type of stainless steel is used in the VHD ductwork?
- b. What does it mean for ductwork not to be single failure proof?
- c. How and where is it determined in the Integrated Safety Analysis (ISA) that VHD ducting failure is highly unlikely?
- d. What codes and standards will be used for design and fabrication of the ducting?

Section 11.3.1.2 discusses the ductwork for the VHD System. Information on the ductwork material, codes and standards used for design and fabrication, and accident analyses are needed to ensure that these components will function reliably during routine operations and under accident conditions.

Information regarding the ventilation system should be included in the application in accordance with the Section 11.4.5 of the SRP.

CONF-7 LA Section 11.3.1.2, p. 11.3-9

Provide details on the operation of the pressure differential control valve.

- a. Clarify the operation of the air-operated valves upstream of the VHD final filter assemblies. The discussion doesn't seem to reflect that there are 4 redundant fans for this system.
- b. Clarify the usage of terms “valves” and “dampers.”

Information regarding the ventilation system should be included in the application in accordance with the Section 11.4.5 (A) of the SRP.

CONF-8 LA Section 11.3.1.2, p. 11.3-10

Provide a detailed description of the VHD fire dilution impact and the basis for the maximum fire temperature.

Information regarding the ventilation system should be included in the application in accordance with the Section 11.4.5 (D) of the SRP.

CONF-9 LA Section 11.3.1.2, p. 11.3-11

Provide the specifications for the stainless steel prefilters in the intermediate filters.

Information regarding the ventilation system should be included in the application in accordance with the Section 11.4.5 (D) of the SRP.

CONF-10 LA Section 11.3.1.2, pp. 11.3-11 and 11.3-12

a) What credit is taken for the glove box HEPA filters for criticality control?

- 1) How are these HEPA filters in-place tested?
- 2) Are the roughing filters stainless steel?
- 3) What are the specifications for the roughing and prefilters?
- 4) What is the difference between a differential pressure indicating switch and a pressure differential indicator?

b) One stage of the supply and exhaust glove box HEPA filters and the intermediate HEPA filters are testable. Does this mean these filters will be tested? Will the testing and sampling ports be in accordance with American Society of Mechanical Engineers (ASME), "Code on Nuclear Air and Gas Treatment," ASME AG-1?

Information regarding the ventilation system should be included in the application in accordance with the Section 11.4.5 of the SRP.

CONF-11 LA Section 11.3.1.2, p. 11.3-13

Clarify the section to state whether two fans are normally operational for one final filter assembly, then they operate at 50 percent of capacity.

Information regarding the ventilation system should be included in the application in accordance with the Section 11.4.5 of the SRP.

CONF-12 LA Figure 11.3-3

Revise the figure to include the nominal size of the HEPA filters to be used.

Information regarding the ventilation system should be included in the application in accordance with the Section 11.4.5 of the SRP.

CONF-13 LA Section 11.3.2.2, p. 11.3-19

Discussion is "Official Use Only – Security Related Information"

CONF-14 LA Section 11.3.2.2, p. 11.3-20

The LA discusses differential pressure gauges with switches. Revise the application to include:

- a) Specific parameters are being monitored.
- b) The differential pressure across the entire assembly, each prefilter and HEPA filter bank, or all of these parameters.
- c) The material of construction for the roughing filters.
- d) Specifications for the roughing and prefilters.

Information regarding the ventilation system should be included in the application in accordance with the Section 11.4.5(A) of the SRP.

CONF-15 LA Section 11.3.2.2, p. 11.3-21

Revise the application to show:

- a) What is the safe position of the air-operated dampers downstream of the fans?
- b) Where are the smoke detectors and temperature indicators that would provide operators information that fire dampers need to be manually closed?
- c) What is basis for air dilution calculations? How many fire areas were considered?
- d) During a tornado event, the High Depressurization Exhaust (HDE) system trips if the VHD filter assembly inlet differential pressure is not maintained. What is the inlet differential pressure (i.e. the differential pressure across the entire filter assembly or the inlet pressure and atmosphere)?
- e) Explain the purpose of the HDE trip.
- f) The LA states that the fire dampers have been modified. What modifications have been made and to what codes are they designed and fabricated?

Information regarding the ventilation system should be included in the application in accordance with the Section 11.4.5 of the SRP.

CONF-16 LA Section 11.3.2.2, p. 11.3-22

The LA states that schedule 5 stainless steel pipe is used for duct diameters of 12 inches and smaller. Revise the application to provide the following:

- a) What type of stainless steel will be used? What is used for larger sizes?
- b) What are the duct design and fabrication standards that will be used for ductwork upstream and downstream of the final filter assemblies?

Information regarding the ventilation system should be included in the application in accordance with the Section 11.4.5 of the SRP.

CONF-17 LA Section 11.3.2.2, p. 11.3-23

Discussion is "Official Use Only – Security Related Information"

CONF-18 LA Section 11.3.2.2, p. 11.3-24

Revise the application to explain what effect on the confinement zones will occur at 50 percent of normal flow while the HDE is on standby power.

Information regarding the ventilation system should be included in the application in accordance with the Section 11.4.5(D) of the SRP.

CONF-19 LA Section 11.3.1.2, p. 11.3-13; Section 11.3.2.2, p. 11.3-20; Section 11.3.3.2, p. 11.3-26

Revise the application to indicate what inlet differential pressure is used to control the fan speed.

- a) What is the differential pressure that is being measured?
- b) Clarify whether this is a measurement of filter unit inlet pressure rather than differential pressure.

Information regarding the ventilation system should be included in the application in accordance with the Section 11.4.5(D) of the SRP.

CONF-20 LA Section 11.3.3.2, p. 11.3-26

Clarify whether the differential pressure across the filter assembly and each filter bank is measured.

Information regarding the ventilation system should be included in the application in accordance with the Section 11.4.5 of the SRP.

CONF-21 LA General

Discussion is "Official Use Only – Security Related Information"

CONF-22 LA Section 11.3.1.2, p. 11.3-10; Section 11.3.2.2, p. 11.3-21; Section 11.3.3.2, p. 11.3-27

Discussion is "Official Use Only – Security Related Information"

CONF-23 LA Section 11.3.1.3, p. 11.3-15; Section 11.3.2.3, p. 11.3-22; Section 11.3.3.3, p. 11.3-29; 11.3.4.2, pp. 11.3-32 and 33

The control functions use the differential pressure between the inlet of filter assembly and atmosphere. Clarify whether atmosphere means confinement area pressure or outside atmospheric pressure.

Information regarding the ventilation system should be included in the application in accordance with the Section 11.4.5 of the SRP.

CONF-24 LA Section 11.3.3.3, p. 11.3-30

Discussion is "Official Use Only – Security Related Information"

CONF-25 LA Section 11.3.5.2, p. 11.3-39

Revise the application to provide the specifications for the Supply Air System prefilters.

Information regarding the ventilation system should be included in the application in accordance with the Section 11.4.5 of the SRP.

CONF-27 LA Section 11.3.6.2, p. 11.3-43

Clarify whether the emergency control room ventilation system has a safety function.

Discussion is "Official Use Only – Security Related Information"

Information regarding the ventilation system should be included in the application in accordance with the Section 11.4.5(D) of the SRP.

CONF-28 LA Section 11.3.6.2, p. 11.3-44

Discussion is "Official Use Only – Security Related Information"

CONF-29 LA Section 11.3.6.3, p. 11.3-46

Provide the allowable limits in the intake air for radiation, smoke, and hazardous chemicals.

The emergency control room ventilation system automatically switches to the filtration mode when the allowable limits in the intake air for radiation, smoke, or hazardous chemicals is

exceeded. However, the LA did not indicate what the allowable limits will be to trigger the switch to the filtration mode.

Information regarding the ventilation system should be included in the application in accordance with the Section 11.4.5(D) of the SRP.

CONF-30 LA Section 11.3.9.1, pp. 11.3-56 through 11.3-59

- a. The LA states that glove boxes will be leak tested in accordance with American Glove box Society (AGS), "Guideline for Glove boxes," AGS-G001. Will glove boxes also be designed, fabricated, installed, operated, and maintained in accordance with AGS-G001?
- b. The LA indicates that glove boxes will be constructed of stainless steel. What type of stainless steel will be used for glove box construction?
- c. Discussion is "Official Use Only – Security Related Information"

Information regarding the ventilation system should be included in the application in accordance with the Section 11.4.5 of the SRP.

CONF-31 LA Section 11.3.10, pp. 11.3-63 to 11.3-67

Clarify the application to provide detailed information on specifically what components in what confinement systems will be designed to the individual codes or standards listed.

Section 11.3.10 provides a listing of codes and standards for IROFS components. However, it is unclear which codes and standards apply to which components.

Information regarding the ventilation system should be included in the application in accordance with the Section 11.4.5 of the SRP.

CONF-32 LA Figures 11.3-3 through 11.3-6, pp. 11.3-77 through 11.3-80

Provide a table showing the component symbols used in the figures.

Figures 11.3-3 through 11.3-6 show schematics of ventilation systems with individual equipment components. However, a description of the component symbols is not provided in the LA or the ISA Summary. A description of the component symbols is needed to understand the system functions.

Information regarding the ventilation system should be included in the application in accordance with the Section 11.4.5 of the SRP.

CONF-33 ISA summary - General

Provide of list showing the confinement system design bases as presented in the Construction Authorization Report and confinement system items relied on for safety (IROFS). Describe any changes and provide a rationale for those changes.

The MOX construction was authorized based on a review of the facility design bases. In reviewing the license application it is necessary to compare the design bases with the identified IROFS and any changes that have been made since the construction was authorized.

Information regarding the ventilation system should be included in the application in accordance with the Section 11.4.5 of the SRP.

CONF-34 ISA Summary, Section 4.3.1.2, p. 4.3-5

Explain how the maximum credible breach in glove boxes was evaluated and how the maximum breach size was determined.

Discussion is "Official Use Only – Security Related Information"

Information regarding the ventilation system should be included in the application in accordance with the Section 11.4.5 of the SRP.

CONF-35 ISA Sections 5.3.3.2.9.2 and 5.3.3.2.9.3, pp. 5.3.3-25 through 5.3.3-30

- a. Explain how the differential pressure set points are determined to ensure that glove boxes do not lose confinement during under- and over-pressurization events.
- b. What are the design under- and over-pressures for glove box construction?

Discussion is "Official Use Only – Security Related Information"

Information regarding the ventilation system should be included in the application in accordance with the Section 11.4.5 of the SRP.

CONF-36 ISA Table 5.3.3-2, pp. 5.3.3-98 through 5.3.3-105

Discussion is "Official Use Only – Security Related Information"

CONF-37 ISA Section 5.3.4.2, pp. 5.3.4-2 through 5.3.4-55

Describe what analyses have been performed to ensure that the VHD, the HDE, the MDE, the POE, systems are protected against high soot loadings and will continue to maintain confinement objectives during fires.

Reviews of research studies and calculations of project soot loadings during fire events, show that soot generation could exceed the capacity of the final filters and could cause final HEPA filter rupture or excessively load filters such that confinement is lost in the VHD, the HDE, MDE, and the POE systems.

Information regarding the ventilation system should be included in the application in accordance with the Section 11.4.5 of the SRP.

CONF-38 ISA Section 5.3.4.2.2, pp. 5.3.4-10 through 5.3.4-12

Explain what design features will be used to protect final filter assembly HEPA filters from excessive soot loading. What are the consequences of having to shut down all the confinement dynamic systems?

Discussion is “Official Use Only – Security Related Information”

Information regarding the ventilation system should be included in the application in accordance with the Section 11.4.5 of the SRP.

CONF-39 ISA Section 5.4.3.2.2, pp. 5.4.3-13 through 5.4.3-17

- a. What calculations have been performed to justify that credited components in the confinement systems will function properly due to high temperatures from large fires?
- b. Do soot generation analyses assume that a fraction of the soot will bypass the intermediate prefilters and load the final filter assembly components, including the final HEPA filters?
- c. How is the VHD intermediate prefilter performance due to high temperature distortion of filter frames determined?

The ISA Summary discusses high temperature effects on confinement system IROFS during large fires. However, it is unclear what calculations were performed to justify that IROFS can properly function under the high temperature conditions of large fires. Staff would consider it unacceptable to credit a plugged filter for preventing air flow as filters are not engineered to perform this function.

Information regarding the ventilation system should be included in the application in accordance with the Section 11.4.5 of the SRP.