TECHNICAL SPECIFICATIONS: PENN STATE BREAZEALE REACTOR (PSBR) FACILITY LICENSE NO. R-2

3.5 Engineered Safety Features - Ventilation Systems

Applicability

This specification applies to the operation of the reactor bay heating ventilation and exhaust system (RBHVES) and the emergency exhaust system (EES).

Objective

The objective is to mitigate the consequences of the release of airborne radioactive materials resulting from reactor operation.

Specification

- a. EXCEPT for conditions 3.5.a(i) and 3.5.a(ii), the reactor SHALL NOT be operated unless reactor bay differential pressure is negative.
 - (i) Following discovery of loss of negative differential pressure, the reactor may be operated for up to 30 minutes while negative differential pressure is restored.
 - (ii) The reactor may continue to operate during brief changes to bay pressure that are not long enough to extinguish the RBHVES differential pressure indicator lamp.
- b. If the reactor is operating, except for periods of time less than 48 hours during maintenance or repair, the emergency exhaust system SHALL be operable.
- c. If irradiated fuel or a fueled experiment with significant fission product inventory is being moved outside containers, systems or storage areas, at least one reactor bay exhaust fan SHALL be operating and the emergency exhaust system SHALL be operable.

Upon discovery of no operating reactor bay exhaust fans OR discovery of an inoperable emergency exhaust system, immediately place the fuel or fueled experiment in a safe storage location and cease further movements until compliance with 3.5.b is restored.

Basis

During normal operation, the concentration of airborne radioactivity in unrestricted areas is below effluent release limits as described in the Safety Analysis Report, Chapter 13. The operation of any of the reactor bay exhaust fans, either the reactor bay heating ventilation and exhaust system or emergency exhaust system, will maintain this condition and provide confinement as defined by TS 1.1.8. If all exhaust from the reactor bay is temporarily lost, the thirty minute limit to restore exhaust gives the operators sufficient time to investigate and respond by checking for penetrations into the confinement bay and energizing fans. Reactor bay area radiation and/or particulate radiation monitors will continue to assure than an unrecognized hazardous condition does not develop. The RBHVES differential pressure indicator lamp is in plain view of the reactor operator in the control room. Due to integration time constants built into the RBHVES control software, brief (<5 minute) losses of differential pressure will not change the state of the indicator lamp.

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In the event of a substantial release of airborne radioactivity, an air radiation monitor and/or an area radiation monitor will sound a building evacuation alarm which will alert personnel and automatically cause the reactor bay heating ventilation and exhaust system to shut down. The emergency exhaust system will start and the exhausted air will be passed through the emergency exhaust system filters before release. This reduces the radiation within the building. The filters will remove $\approx 90\%$ all of the particulate fission products that escape to the atmosphere.

The emergency exhaust system activates only during an evacuation whereupon all personnel are required to evacuate the building (TS 3.6.2). If there is an evacuation while the emergency exhaust system is out of service for maintenance or repair, personnel evacuation is not prevented.

In the unlikely event an accident occurs during emergency exhaust system maintenance or repair, the public dose will be equivalent to or less than that calculated in the Safety Analysis Report, Chapter 13.

During irradiated fuel or fueled experiment movement, the likelihood of an event releasing fission products is increased. Therefore the continuous operation of a reactor bay exhaust fan and the availability of an operable filtered exhaust is prudent. If the system fails or is discovered to be inoperable during movement activities, the fuel or fueled experiment must be immediately placed in a safe storage location. No additional movements may be conducted until the limiting condition for operation is satisfied.

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