4.10 EMERGENCY CONTROL ROOM FILTERING SYSTEM

Applicability

Applies to the emergency control room filtering system components.

Objective

To verify that these systems and components will be able to perform their design functions.

Surveillance Requirements

4.10.1 The Control Room Emergency Ventilation shall be demonstrated OPERABLE:

a. At least once per 30 days by initiating flow through the ventilation/cooling system and demonstrating that the outside air makeup system maintains the room at positive pressure of ≥ .005 inches W.G. relative to the outside atmosphere during system operation.

b. At least each refueling interval, and (1) after each complete or partial replacement of a HEPA filter or charcoal adsorber bank or (2) after any structural maintenance on the HEPA filter or charcoal adsorber housings by:

.1 Verifying that the charcoal adsorbers remove ≥ 99 percent of a halogenated hydrocarbon refrigerant test gas when they are tested in-place in accordance with USNRC Report DP-1082 while operating the supply fan at a flow rate of 40 cfm ± 20 percent.

.2 Verifying that the HEPA filter banks remove ≥ 99 percent of the DOP when they are tested in-place in accordance with ANSI N101.1-1972 while operating the ventilation system at a flow rate of 40 cfm ± 20 percent.

.3 Verifying a system flow rate of 40 cfm ± 20 percent during system operation.

.4 Verifying that the pressure drop across the combined HEPA filters and charcoal adsorber banks is < 6 inches Water Gauge while operating the ventilation system at a flow rate of 40 cfm ± 20 percent.

.5 Verifying that on a high radiation signal, the normal system automatically is isolated and that the Emergency System operates.

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Surveillance Requirements (Continued)

c. At each refueling interval, subject at least two carbon samples, removed from each charcoal bank, to a laboratory carbon sample analysis and verify a removal efficiency of $\geq$ 90 percent for radioactive methyl iodide at an air flow velocity of 40 ft/min $\pm$ 20 percent with an inlet methyl iodide concentration of 1.5 to 2.0 mg/m^3, 70 $\pm$ 5 percent relative humidity, and 25 $\pm$ 2°C. Other test conditions shall be in accordance with USNRC RDT Standard M-16-1T, Oct. 1973. The carbon samples shall be prepared by emptying one bed from a removed adsorber tray, mixing the adsorbent thoroughly, and obtaining samples at least two inches in diameter with a length equal to the thickness of the bed.

Bases

The purpose of the emergency control room filtering system is to limit the particulate and gaseous fission products to which the control area would be subjected during an accidental radioactive release in or near the Auxiliary Building. The system is designed with a filter train which consists of a prefilter, high efficiency particulate filter, charcoal filter and a booster fan to pressurize the control room with outside air.

Since this system is not normally operated, a periodic test is required to insure its operability when needed. Monthly testing of this system will show that the system is available for its safety action. During this test the system will be inspected for such things as water, oil, or other foreign material; gasket deterioration, adhesive deterioration in the HEPA units; and unusual or excessive noise or vibration when the fan motors are running.

Refueling interval testing will verify the efficiency of the charcoal and absolute filters when they are not required for safety during reactor shutdown.

4.11 REACTOR BUILDING PURGE FILTERING SYSTEM

Applicability

Applies to testing Reactor Building purge filters.

Objective

To verify that the Reactor Building purge filters will perform their design function.

Surveillance Requirements

4.11.1 The Reactor Building purge system shall be demonstrated OPERABLE:

a. At least once per 30 days by:

.1 Initiating from the control room flow through the HEPA filter and charcoal adsorber train and verifying that the purge system operates for at least 10 hours.

b. At least once per refueling interval and (1) after each complete or partial replacement of a HEPA filter or charcoal adsorber bank or (2) after any structural maintenance on the HEPA filter or charcoal adsorber housings by:

.1 Verifying that the charcoal adsorbers remove $\geq$ 99 percent of a halogenated hydrocarbon refrigerant test gas when they are tested in-place in accordance with USNRC Report DP-1082 while operating the purge system at a flow rate of 74,000 cfm $\pm$ 10 percent.

.2 Verifying that the HEPA filter banks remove $\geq$ 99 percent of the DOP when they are tested in-place in accordance with ANSI N101.1-1972 while operating the purge system at a flow rate of 74,000 cfm $\pm$ 10 percent.

.3 Verifying a system flow rate of 74,000 cfm $\pm$ 10 percent during system operation.

.4 Verifying that the pressure drop across the combined HEPA filters and charcoal adsorber banks is < 6 inches Water Gauge while operating the purge system at a flow rate of 74,000 cfm $\pm$ 10 percent.

.5 Verifying that the air flow distribution across each HEPA filter bank and charcoal adsorber bank is within $\pm$ 20 percent of the averaged flow per filter cartridge.

.6 Verifying that the winter/summer bypass valves can be operated to provide 18,000 cfm $\pm$ 10 percent building purge rate during winter position setting.

Surveillance Requirements (Continued)

c. At each refueling interval, subject at least two carbon samples, removed from one of the charcoal adsorbers, to a laboratory carbon sample analysis and verify a removal efficiency of $\geq$ 90 percent for radioactive methyl iodide at an air flow velocity of 40 ft/min $\pm$ 20 percent with an inlet methyl iodide concentration of 1.5 to 2.0 mg/m^3, 70 $\pm$ 5 percent relative humidity, and 25 $\pm$ 2°C; other test conditions shall be in accordance with USNRC RDT Standard M-16-IT, Oct. 1973. The carbon samples shall be prepared by emptying one bed from a removed adsorber tray, mixing the adsorbent thoroughly, and obtaining samples at least two inches in diameter and with a length equal to the thickness of the bed.

Bases

The Reactor Building purge filters are constructed with a prefilter, an absolute filter and a charcoal filter in series. These tests will verify the efficiency of the absolute and charcoal filters.

4.12 REACTOR BUILDING EMERGENCY FILTERING SYSTEM

Applicability

Applies to testing Reactor Building emergency filters.

Objective

To verify that the Reactor Building emergency filters will perform their design function.

Surveillance Requirements

4.12.1 The Reactor Building Emergency Filtering system shall be demonstrated OPERABLE:

a. OPERABILITY of the fans and associated cooling equipment is demonstrated in Technical Specification 4.5.2.

b. At least once per refueling interval and (1) after each complete or partial replacement of a charcoal adsorber bank or (2) after any structural maintenance on the filter or charcoal adsorber housings by:

.1 Verifying that the charcoal adsorbers remove $\geq$ 99 percent of a halogenated hydrocarbon refrigerant test gas when they are tested in-place in accordance with USNRC Report DP-1082 while operating the system at a flow rate of 40,000 cfm $\pm$ 10 percent.

.2 Verifying that the pressure drop across the charcoal adsorber banks is < 3 inches Water Gauge while operating the ventilating system at a flow rate of 40,000 cfm $\pm$ 10 percent.

.3 Verifying that the air flow distribution across each charcoal adsorber bank is within $\pm$ 20 percent of the averaged flow per filter cartridge.

c. At each refueling interval, subject at least two carbon samples, removed from one of the charcoal adsorbers, to a laboratory carbon sample analysis and verify a removal efficiency of $\geq$ 85 percent for radioactive methyl iodide at an air flow velocity of 40 ft/min $\pm$ 20 percent with an inlet methyl iodide concentration of 1.5 to 2.0 mg/m^3, 95 $\pm$ 5 percent relative humidity, and 130 $\pm$ 2°C; other test conditions shall be in accordance with USNRC RDT Standard M-16-1T, October 1973. The carbon samples shall be prepared by emptying one bed from a removed adsorber tray, mixing the adsorbent thoroughly, and obtaining samples at least two inches in diameter and with a length equal to the thickness of the bed.

Surveillance Requirements (Continued)

Bases

The Reactor Building emergency filters are charcoal filters. These tests will verify the efficiency of the charcoal filters to equal or exceed the values assumed in Maximum Hypothetical Accident Safety Analysis.

4.16 STORAGE POOL VENTILATION SYSTEM - FUEL MOVEMENT/STORAGE

Applicability

Applies to the Spent Fuel Pool ventilation system when irradiated fuel is being moved or is being stored.

Objective

To verify that the Spent Fuel Pool filtering system and components will be able to perform their design functions.

Surveillance Requirements

4.16.1 When irradiated fuel which has decayed less than 90 days is in the spent fuel storage pool:

a. The spent fuel storage pool building ventilation system shall be verified to be operating with all spent fuel building doors closed (excepting intermittent personnel use) prior to fuel movement and at least once per 8 hours during either fuel movement within the spent fuel storage pool or crane operation with loads over the spent fuel storage pool.

4.16.2 Whenever irradiated fuel is in the storage pool the above required spent fuel storage pool ventilation system shall be demonstrated in OPERATION:

a. At least once per 30 days by observing flow through the HEPA filter and charcoal adsorber train and verifying that the train operates with < 6 inches Water Gauge pressure drop across the combined HEPA and Charcoal filter banks.

b. At least once per refueling interval and (1) after each complete or partial replacement of a HEPA filter or charcoal adsorber bank or (2) after any structural maintenance on the HEPA filter or charcoal adsorber housings by:

.1 Verifying that with the Auxiliary Building exhaust system operating at a flow rate of 43,400 cfm ± 10 percent and exhausting through the HEPA filters and charcoal adsorbers, to the facility vent, provides 10,800 cfm ± 10 percent exhaust from the spent fuel pool area.

.2 Verifying that the charcoal adsorbers remove ≥ 99 percent of a halogenated hydrocarbon refrigerant test gas when they are tested in-place in accordance with USNRC Report DP-1082 while operating the ventilation system at a flow rate of 43,400 cfm ± 10 percent.

Surveillance Requirements (Continued)

.3 Verifying that the HEPA filter banks remove ≥ 99 percent of the DOP when they are tested in-place in accordance with ANSI N101.1-1972 while operating the ventilation system at a flow rate of 43,400 cfm ± 10 percent.

.4 Verifying that the pressure drop across the combined HEPA filters and charcoal adsorber banks is < 6 inches Water Gauge while operating the ventilating system at a flow rate of 43,400 cfm ± 10 percent.

.5 Verifying that the air flow distribution across each HEPA filter bank and charcoal adsorber bank is within ± 20 percent of the averaged flow per filter unit.

.6 Verifying that the ventilation system maintains the spent fuel storage pool area at a negative pressure of ≥ 0.01 inches Water Gauge relative to the outside atmosphere during system operation.

c. At each refueling interval, subject at least two carbon samples, removed from one of the charcoal adsorbers, to a laboratory carbon sample analysis and verify a removal efficiency of ≥ 90 percent for radioactive methyl iodide at an air flow velocity of 40 ft/min ± 20 percent with an inlet methyl iodide concentration of 1.5 to 2.0 mg/m^3, 70 ± 5 percent relative humidity, and 25 ± 2°C; other test conditions shall be in accordance with USNRC RDT Standard M-16-1T, October 1973. The carbon samples shall be prepared by emptying one bed from a removed adsorber tray, mixing the adsorbent thoroughly, and obtaining samples at least two inches in diameter and with a length equal to the thickness of the bed.

Bases

The Spent Fuel Pool ventilation system consists of particulate, HEPA, and charcoal filters. These tests will verify the efficiency of the filters.