12. A spent fuel cask or heavy loads exceeding 110 percent of the weight of a fuel assembly (not including fuel handling tool) shall not be moved over spent fuel, and only one spent fuel assembly will be handled at one time over the reactor or the spent fuel pit.

13. A spent fuel cask shall not be moved into the Fuel Building unless the Cask Impact Pads are in place on the bottom of the spent fuel pool.

14. Two trains of the control ~~and relay~~ room ~~emergency~~ ventilation Supply system shall be operable. With one train inoperable for any reason, demonstrate the other train is operable by performing the test in Specification 4.20.A.1. With both trains inoperable comply with Specification 3.10.B.

B. If any one of the specified limiting conditions for refueling is not met, refueling of the reactor shall cease, work shall be initiated to correct the conditions so that the specified limit is met, and no operations which increase the reactivity of the core shall be made.

C. After initial fuel loading and after each core refueling operation and prior to reactor operation at greater than 75% of rated power, the movable incore detector system shall be utilized to verify proper power distribution.

D. The requirements of 3.0.1 are not applicable.

Basis

Detailed instructions, the above specified precautions and the design of the fuel handling equipment, which incorporates built-in interlocks and safety features, provide assurance that an accident, which would result in a hazard to public health and safety, will not occur during refueling operations. When no change is being made in core geometry, one neutron detector is sufficient to monitor the core and permits maintenance of the out-of-function instrumentation. Continuous monitoring of radiation levels and neutron flux provides immediate indication of an unsafe condition. Containment high radiation levels and high airborne activity levels automatically stop and isolate the Containment Purge System. The fuel building ventilation exhaust is diverted through charcoal filters whenever refueling is in progress. At least one flow path is required for cooling and mixing the coolant contained in the reactor vessel so as to maintain a uniform boron concentration and to remove residual heat.

The shutdown margin established by Specification A-9 maintains the core subcritical, even with all of the control rod assemblies withdrawn from the core. During refueling, the reactor refueling water cavity is filled with approximately 220,000 gal of water borated to at least 2,000 ppm boron. The boron concentration of this water is sufficient to maintain the reactor subcritical by approximately 10% W k/k in the cold shutdown condition with all control rod assemblies inserted and also to maintain the core subcritical by approximately 1% with no control rod assemblies inserted into the reactor. Periodic checks of refueling water boron concentration assure the proper shutdown margin. Specification A-10 allows the Control Room Operator to inform the manipulator operator of any impending unsafe condition detected from the main control board indicators during fuel movement.

3.19 MAIN CONTROL ROOM BOTTLED AIR SYSTEM

Applicability

Applies to the ability to maintain a positive differential pressure in the main control room.

Objective

To specify functional requirements for the main control room bottled air system.

Specification

A. Requirements

A bottled dry air bank shall be available to pressurize the main control room to a positive differential pressure with respect to adjoining areas of the auxiliary, turbine, and service buildings for one hour. A minimum positive differential pressure of 0.05 inches of water must be maintained when the control room is isolated under accident conditions. This capability shall be demonstrated by the testing requirement delineated in Technical Specification 4.1.

B. Remedial Action

If the requirements of Section A are not met, the unit shall be placed in the hot shutdown condition within 8 hours; except that if tests during the 8-hour period demonstrate that the emergency control room ventilation system is functional, the unit shall be brought within the requirements of Section A or placed in the hot shutdown condition within 24 hours.

3.22 AUXILIARY VENTILATION EXHAUST FILTER TRAINS

Applicability

Applies to the ability of the safety-related system to remove particulate matter and gaseous iodine following a LOCA or a refueling accident.

Objective

To specify requirements to ensure the proper function of the system.

Specification

A. ~~Whenever either unit's Reactor Coolant System temperature and pressure is greater than 350°F and 450 psig, respectively,~~ Two auxiliary ventilation exhaust filter trains shall be operable at all times with:

1. Two filter exhaust fans
2. Two HEPA filter and charcoal adsorber assemblies.

B. With one train of the exhaust filter system inoperable for any reason

1. Return the inoperable train to a operable status within 7 days or be in at least Hot Shutdown within the next 6 hours and in Cold Shutdown within the following 48 hours.
2. When one train of the exhaust filter becomes inoperable the operability of the other train shall be demonstrated immediately ~~and daily thereafter~~. The operability of the other train shall be demonstrated by performing Step A.1 of Technical Specification 4.12.

Basis

The purpose of the filter trains located in the auxiliary building is to provide standby capability for removal of particulate and iodine contaminants from the exhaust air of the charging pump cubicles of the auxiliary building, fuel building, decontamination building, safeguards building adjacent to the containments, and the reactor containment (during shutdown) which discharge through the ventilation vent and could require filtering prior to release. During normal plant operation, the exhaust from any one of these areas can be diverted, if required, through the auxiliary building filter trains remotely from the control room. The safeguards building exhaust and the charging pump cubicle exhaust are automatically diverted through the filter trains in the event of a LOCA (diverted on safety injection system signal). The fuel building exhaust and purge exhaust are aligned to continuously pass through the filters during spent fuel handling.

High efficiency particulate absolute (HEPA) filters are installed before the charcoal adsorbers to prevent clogging of the iodine adsorbers. The charcoal adsorbers are installed to reduce the potential release of radioiodine to the environment.

3.23 CONTROL ~~AND RELAY~~ ROOM VENTILATION SUPPLY FILTER TRAINS

APPLICABILITY

Applies to the control ~~and relay~~ room emergency ~~emergency~~ ventilation system.

OBJECTIVE

To specify requirements to ensure the proper function of the control ~~and relay~~ room emergency ventilation system.

SPECIFICATION

A. Both trains of the control ~~and relay~~ room emergency ventilation system shall be operable whenever either unit is above cold shutdown.

B. With one train of the control and relay room emergency ventilation system inoperable for any reason, return the inoperable train to a operable status within 7 days or be in at least Hot Shutdown within the next 6 hours and in Cold Shutdown within the following 48 hours.

BASIS

When the supply of compressed bottled air is depleted, the control room ~~and relay~~ room emergency ventilation system is manually started to continue to maintain the control room pressure at the design positive pressure so that all leakage is outleakage. One train of the control room emergency ventilation consists of one fan powered from an independent emergency power source.

The control ~~and relay~~ room emergency ventilation system is designed to filter the intake air to the control room pressure envelope, which consists of the control room, relay rooms, and emergency switchgear rooms during a LOCA.

High efficiency particulate air (HEPA) filters are installed before the charcoal adsorbers to prevent clogging of the iodine adsorbers. The charcoal adsorbers are installed to reduce the potential intake of radioiodine to the control room. The in-place test results should indicate a system leaktightness of less than 1 percent bypass leakage for the charcoal adsorbers and a HEPA efficiency of at least 99.5 percent removal of DOP particulates. The laboratory carbon sample test results should indicate a radioactive methyl iodide removal efficiency of at least 95 percent for expected accident conditions. The control room dose calculations assume only 90 percent iodine removal efficiency for the air passing through the charcoal filters. Therefore, if the efficiencies of the HEPA filters and charcoal adsorbers are as specified, at the temperatures, flow rates and velocities within the design values of the system, the resulting doses will be less than the allowable levels stated in Criterion 19 of the General Design Criteria for Nuclear Power Plants, Appendix A to 10 CFR Part 50.

If the system is found to be inoperable, there is no immediate threat to the control room, and reactor operation may continue for a limited period of time while repairs are being made. If the system cannot be repaired within the specified time, procedures are initiated to establish conditions for which the filter system is not required.

4.12 AUXILIARY VENTILATION EXHAUST FILTER TRAINS

Applicability

Applies to the testing of safety-related air filtration systems.

Objective

To verify that leakage efficiency and iodine removal efficiency are within acceptable limits.

Specifications

A. Tests and Frequency

1. Each redundant filter train circuit shall be operated every month if it has not already been in operation.
2. At least once per refueling cycle, the operability of the entire safety-related portion of the auxiliary ventilation system shall be demonstrated.
3. Auxiliary ventilation system exhaust fan flow rate through each filter train in the LOCA mode of operation shall be determined initially, after any structural maintenance on the HEPA filter or charcoal adsorber housings, once per refueling cycle, i. e. approximately 18 months, or after partial or complete replacement of the HEPA filters or charcoal adsorbers.

   The procedure for determining the air flow rate shall be in accordance with Section 9 of the ACGIH Industrial Ventilation document and Section 8 of ANSI N510-1975.
4. A visual inspection of the filter train and associated components shall be conducted before each in-place air flow distribution test, DOP test, or activated charcoal adsorber leak test in accordance with the intent of section 5 of ANSI N510-1975.

5. An air distribution test across the prefilter bank shall be performed initially and after any major modification, major repair, or maintenance of the air cleaning system affecting the filter bank flow distribution.

   The air distribution test shall be performed with an anemometer located at the upstream side and at the center of each prefilter cell.

6. In-place cold DOP tests for HEPA filter banks shall be performed:

   a. Initially,

   b. At least once per refueling cycle, i.e., approximately every eighteen months,

   c. Following painting, fire, or chemical release in any ventilation zone communicating with the system,

   d. After each complete or partial replacement of the HEPA filter cells, and

   e. After any structural maintenance on the filter housing.

   The procedure for in-place cold DOP tests shall be in accordance with ANSI N510-1975, Section 10.5 or 11.4. The flow rate during the in-place cold DOP tests shall be 36,000 CFM ±10 percent. The flow rate shall be determined by recording the flow meter reading in the control room.

7. In-place halogenated hydrocarbon leakage tests for the charcoal adsorber bank shall be performed:

   a. Initially,

   b. At least once per refueling cycle, i.e., approximately every eighteen months,

   c. Following painting, fire, or chemical release in any ventilation zone communicating with the system,

d. After each complete or partial replacement of charcoal adsorber trays, and

e. After any structural maintenance on the filter housing.

The procedure for in-place halogenated hydrocarbon leakage tests shall be in accordance with ANSI-N510-1975, Section 12.5. The flow rate during the in-place halogenated hydrocarbon leakage tests shall be 36,000 CFM ±10 percent. The flow rate shall be determined by recording the flow meter reading in the control room.

8. Laboratory analysis on in-place charcoal samples shall be performed:

a. Initially, whenever a new batch of charcoal is used to fill adsorbers trays,

b. At least once per refueling cycle, i.e., approximately every eighteen months,

c. After 720 hours of system operation, and

d. Following painting, fire, or chemical release in any ventilation zone communicating with the system or after any structural maintenance on the HEPA filter or charcoal adsorber housings.

The procedure for iodine removal efficiency tests shall follow ASTM D3803. The test conditions shall be in accordance with those listed in TS 4.12.B.7.

9. The pressure drop across the HEPA filter and adsorber banks shall be checked:

a. Initially,

b. At least once per refueling cycle thereafter for systems maintained in a standby status and after 720 hours of system operation, and

c. After each complete or partial replacement of filters or adsorbers.

B. Acceptance Criteria

1. The minimum period of air flow through the filters shall be 15 minutes per month.
2. The system operability test of Specification 4.12.A.2 shall demonstrate automatic start-up, shutdown and flow path alignment.
3. The air flow rate determined in Specifications 4.12.A.3 shall be:
   a. 36,000 cfm± 10 percent with system in the LOCA mode of operation.
   b. The ventilation system shall be adjusted until the above limit is met.
4. Air distribution test across the prefilter-bank shall show uniformity of air velocity within ± 20 percent of average velocity. The ventilation system shall be adjusted until the limit is met.
5. In-place cold DOP tests on HEPA filters shall show greater than or equal to 99.5 percent DOP removal. Leakage sources shall be identified, repaired, and retested. Any HEPA filters found defective shall be replaced.
6. In-place halogenated hydrocarbon leakage tests on charcoal adsorber banks shall show greater than or equal to 99 percent halogenated hyrodcarbon removal. Leakage sources shall be identified, repaired, and retested.
7. Laboratory analysis on in-place charcoal samples shall show at least 96 percent methyl iodide removal at 0.125 sec. residence time, 1.75±0.25 mg/m^3 inlet methyl iodide concentration, relative humidity equal to ~~80±3~~ 95±2 percent, and air temperature equal to 30±0.5°C.

a. Laboratory analysis of charcoal adsorbers shall be available within 31 days of sampling.

b. If the test results are unacceptable, all the adsorbent in the affected filter shall be replaced with new adsorbent qualified in accordance with Table 5.1 of ANSI N509-1976.

8. The pressure drop across filter cells and adsorbers shall not exceed 7.0 inches W. G. If this condition cannot be met, new filter cells shall be installed.

Basis

Ventilation system filter components are not subject to rapid deterioration, having lifetimes of many years, even under continuous flow conditions. The tests outlined above provide assurance of filter reliability and will ensure timely detection of conditions which could cause filter degradation.

A pressure drop across the combined HEPA filters and charcoal adsorbers of less than 7 inches of water at the system design flow rate will indicate that the filters and adsorbers are not clogged by excessive amounts of foreign matter. Operation of the filtration system for a minimum of 15 minutes a month prevents moisture buildup in the filters and adsorbers.

The frequency of tests and sample analysis of the degradable components of the system, i.e., the HEPA filter and charcoal adsorbers, is based on actual hours of operation to ensure that they perform as evaluated. System flow rates and air distribution do not change unless the ventilation system is radically altered.

If painting, fire, or chemical release occurs such that the HEPA filter or charcoal adsorber could become contaminated from the fumes, chemical, or foreign material, the same tests and sample analysis are performed as required for operational use.

The in-place test results should indicate a system leak tightness of less than 1 percent bypass leakage for the charcoal adsorbers and a HEPA efficiency of at least 99.5 percent removal of DOP particulates. The heat release from operating ECCS equipment limits the relative humidity of the exhaust air to less than 80 percent even when outdoor air is assumed to be 100 percent relative humidity and all ECCS leakage evaporates into the exhaust air stream. The laboratory carbon sample tests are required to indicate a radioactive methyl iodide removal efficiency of at least 96 percent at a relative humidity equal to ~~80±3~~ 95±2 percent. The offsite dose calculations for LOCA and fuel handling accidents assume 90 percent and 70 percent, respectively, iodine removal efficiency for the air passing through the charcoal filters. Therefore, the efficiencies of the HEPA filters and charcoal adsorbers are demonstrated to be as specified, at flow rates, temperatures, velocities, and relative humidities which are less than the design values of the system, the resulting doses will be less than 10 CFR 100 guidelines for the accidents analyzed. The demonstration of bypass 1% and demonstration of 96 percent methyl iodide removal efficiency will assure the required capability of the filters is met or exceeded.

4.20 CONTROL ROOM AIR FILTRATION SYSTEM

APPLICABILITY

Applies to the testing of safety-related air filtration systems of the control room and relay room.

OBJECTIVE

To verify that leakage efficiency and iodine removal efficiency are within acceptable limits.

SPECIFICATION

A. Tests and Frequency

1. The control room air filtration system flow rate test shall be performed:
   a. Initially,
   b. At least once per refueling cycle, i.e., approximately every eighteen months,
   c. Following painting, fire, or chemical release in any ventilation zone communicating with the system during system operation,
   d. After each complete or partial replacement of the HEPA filter or charcoal adsorbers and
   e. After any structural maintenance the HEPA filter or charcoal adsorber housings.

f. After any major modification or repair of the air cleaning system.

2. The procedure for determining the air flow rate shall be in accordance with Section 9 of the ACGIH Industrial Ventilation document and Section 8 of ANSI N510-1975. A visual inspection of the filter train and its associated components shall be conducted before each in-place airflow distribution test, DOP test, or activated charcoal adsorber leak test in accordance with the intent of Section 5 of ANSI N510-1975.

3. In-place cold DOP tests for HEPA filter banks shall be performed:

   a. Initially,

   b. At least once per refueling cycle, i.e., approximately every eighteen months,

   c. Following painting, fire, or chemical release in any ventilation zone communicating with the system during system operation,

   d. After each complete or partial replacement of the HEPA filter cells, and

   e. After any structural maintenance of the filter housing.

4. The procedure for in-place cold DOP tests shall be in accordance with ANSI N510-1975, Section 10.5 or 11.4. The flow rate during this test shall be that value determined under Section 4.20.A.1 and shall be within the range specified in Section 4.20.B.1.

5. In-place halogenated hydrocarbon leakage tests for the charcoal adsorber bank shall be performed:

   a. Initially,

   b. At least once per refueling cycle, i.e., approximately every eighteen months,

c. Following painting, fire, or chemical release in any ventilation zone communicating with the system during system operation,

d. After each complete or partial replacement of charcoal adsorbers trays, and

e. After any structural maintenance on the filter housing.

6. The procedure for in-place halogenated hydrocarbon leakage tests shall be in accordance with ANSI N510-1975 Section 12.5. The flow rate during this test shall be that value determined under Section 4.20.A.1 and shall be within the range specified in Section 4.20.B.1.

7. Laboratory analysis on charcoal samples shall be performed:

a. Initially, whenever a new batch of charcoal is used to fill adsorber trays,

b. At least once per refueling cycle, i.e., approximately every eighteen months,

c. After 720 hours of system operation, and

d. Following painting, fire, or chemical release in any ventilation zone communicating with the system during system operation.

8. The procedure for iodine removal efficiency tests shall follow ASTM D3803. The test conditions shall be in accordance with those listed in TS 4.20.B.4.

9. The pressure drop across the HEPA filter and adsorber banks shall be checked:

a. Initially,

b. At least once per refueling cycle, i.e., approximately every eighteen months, and

c. After each complete or partial replacement of filters or adsorbers

10. Each filter train circuit shall be operated every month. Filter Train Operation shall be initiated manually from the control room.

B. Acceptance Criteria

1. Fan flow tube test shall show a flow rate through any single filter train of between 750 and 1100 cfm.

2. In-place cold DOP tests on HEPA filters shall show greater than or equal to 99.5 percent DOP removal. Leaking sources shall be identified, repaired and retested. Any HEPA filter found defective shall be replaced.

3. In-place halogenated hydrocarbon leakage tests on charcoal adsorber banks shall show greater than or equal to 99 percent halogenated hydrocarbon removal. Leakage sources shall be identified, repaired and retested.

4. Laboratory analysis on in-place charcoal samples shall show at least 96 percent methyl iodide removal, at 0.125 sec residence time, with 1.75±0.25 mg/m^3 inlet methyl iodide concentration, relative humidity equal to 95±2 percent, and air temperature equal to 30±0.5°C. The laboratory analysis shall be available within 31 days of sampling. If the test results are unacceptable, all adsorbent in the filter shall be replaced with new adsorbent qualified in accordance with Table 5.1 of ANSI N509-1976.

5. The pressure drop across filter cells and adsorbers shall not exceed 5.0 inches W. G at design flow rate. If this condition cannot be met, new filter cells shall be installed.

6. The minimum period of air flow through the filter shall be 15 minutes per month.

BASIS

Ventilation system filter components are not subject to rapid deterioration, having lifetimes of many years. The tests outlined above provide assurance of filter reliability and will ensure timely detection of conditions which could cause filter degradation.

A pressure drop across the combined HEPA filters and charcoal adsorbers of less than 5 inches of water will indicate that the filters and adsorbers are not clogged by excessive amounts of foreign matter. Operation of the filtration system for a minimum of 15 minutes a month prevents moisture buildup in the filters and adsorbers.

The frequency of tests and sample analysis are necessary to show that the HEPA filters and charcoal adsorbers can perform as evaluated.

If painting, fire, or chemical release occurs such that the HEPA filter or charcoal adsorber could become contaminated from fumes, chemicals, or foreign material, the same tests and sample analysis are performed as required for operational use.