Attachment 2 to AEP:NRC:0959

Proposed Revised

Technical Specification Pages

PLANT SYSTEMS

3/4.7.6 ESF VENTILATION SYSTEM

LIMITING CONDITION FOR OPERATION

3.7.6.1 Two independent ESF ventilation system exhaust air filter trains shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

With one ESF ventilation system exhaust air filter train inoperable, restore the inoperable train to OPERABLE status within 7 days or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

4.7.6.1 Each ESF ventilation system exhaust air filter train shall be demonstrated OPERABLE:

a. At least once per 31 days on a STAGGERED TEST BASIS by initiating, from the control room, flow through the HEPA filter and charcoal adsorber train and verifying that the train operates for at least 15 minutes.

b. At least once per 18 months or (1) after any structural maintenance on the HEPA filter or charcoal adsorber housings, or (2) following painting, fire or chemical release in any ventilation zone communicating with the system, by:

    1. Deleted.

    2. Verifying that the charcoal adsorbers remove $\geq$ 99% of a halogenated hydrocarbon refrigerant test gas when they are tested in-place in accordance with ANSI N510-1980 while operating the ventilation system at a flow rate of 25,000 cfm $\pm$ 10%.

    3. Verifying that the HEPA filter banks remove $\geq$ 99% of the DOP when they are tested in-place in accordance with ANSI N510-1980 while operating the ventilation system at a flow rate of 25,000 cfm $\pm$ 10%.

[illegible]

SURVEILLANCE REQUIREMENTS (Continued)

4. Verifying within 31 days after removal that a laboratory analysis of a carbon sample from either at least one test canister or at least two carbon samples removed from one of the charcoal adsorbers demonstrates a removal efficiency of ≥ 90% for radioactive methyl iodide when the sample is tested in accordance with ANSI N510-1980 (130°C, 95% R.H.). The carbon samples not obtained from test canisters shall be prepared by either:

    a) Emptying one entire 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, or

    b) Emptying a longitudinal sample from an 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.

    Subsequent to reinstalling the adsorber tray used for obtaining the carbon sample, the system shall be demonstrated OPERABLE by also verifying that the charcoal adsorbers remove ≥ 99% of a halogenated hydrocarbon refrigerant test gas when they are tested in-place in accordance with ANSI N510-1980 while operating the ventilation system at a flow rate of 25,000 cfm ± 10%.

5. Verifying a system flow rate of 25,000 cfm ± 10% during system operation when tested in accordance with ANSI N510-1980.

c. After every 720 hours of charcoal adsorber operation by either:

1. Verifying within 31 days after removal that a laboratory analysis of a carbon sample obtained from a test canister demonstrates a removal efficiency of ≥ 90% for radioactive methyl iodide when the sample is tested in accordance with ANSI N510-1980 (130°C, 95% R.H.); or

2. Verifying within 31 days after removal that laboratory analyses of at least two carbon samples demonstrate a removal efficiency of ≥ 90% for radioactive methyl iodide when the samples are tested in accordance with ANSI N510-1980 (130°C, 95% R.H.) and the samples are prepared by either:

    a) Emptying one entire 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, or

SURVEILLANCE REQUIREMENTS (Continued)

b) Emptying a longitudinal sample from an 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.

Subsequent to reinstalling the adsorber tray used for obtaining the carbon sample, the system shall be demonstrated OPERABLE by also verifying that the charcoal adsorbers remove ≥ 99% of a halogenated hydrocarbon refrigerant test gas when they are tested in-place in accordance with ANSI N510-1980 while operating the ventilation system at a flow rate of 25,000 cfm ± 10%.

d. At least once per 18 months by:

1. 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 25,000 cfm ± 10%.

2. Deleted.

3. Verifying that the standby fan starts automatically on a Containment Pressure--High-High Signal and directs its exhaust flow through the HEPA filters and charcoal adsorber banks on a Containment Pressure--High-High Signal.*

e. After each complete or partial replacement of a HEPA filter bank by verifying that the HEPA filter banks remove ≥ 99% of the DOP when they are tested in-place in accordance with ANSI N510-1980 while operating the ventilation system at a flow rate of 25,000 cfm ± 10%.

f. After each complete or partial replacement of a charcoal adsorber bank by verifying that the charcoal adsorbers remove ≥ 99% of a halogenated hydrocarbon refrigerant test gas when they are tested in-place in accordance with ANSI N510-1980 while operating the ventilation system at a flow rate of 25,000 cfm ± 10%.

* The provisions of Specification 4.0.6 are applicable.

REFUELING OPERATIONS

STORAGE POOL VENTILATION SYSTEM**

LIMITING CONDITION FOR OPERATION

3.9.12 The spent fuel storage pool exhaust ventilation system shall be OPERABLE.

APPLICABILITY: Whenever irradiated fuel is in the storage pool.

ACTION:

a. With no fuel storage pool exhaust ventilation system OPERABLE, suspend all operations involving movement of fuel within the storage pool or crane operation with loads over the storage pool+ until at least one spent fuel storage pool exhaust ventilation system is restored to OPERABLE status.*

b. The provisions of Specifications 3.0.3 and 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.9.12 The above required fuel storage pool ventilation system shall be demonstrated OPERABLE:

a. At least once per 31 days by initiating flow through the HEPA filter and charcoal adsorber train and verifying that the train operates for at least 15 minutes.

b. At least once per 18 months or (1) after any structural maintenance on the HEPA filter or charcoal adsorber housings, or (2) following painting, fire or chemical release in any ventilation zone communicating with the system, by:

   1. Deleted.

   2. Verifying that the charcoal adsorbers remove $\geq$ 99% of a halogenated hydrocarbon refrigerant test gas when they are tested in-place in accordance with ANSI N510-1980 while operating the exhaust ventilation system at a flow rate of 30,000 cfm $\pm$ 10%.

* The crane bay roll-up door and the drumming room roll-up door may be opened under administrative control during movement of fuel within the storage pool or crane operation with loads over the storage pool.

** Shared system with D. C. COOK - UNIT 2.

\+ This does not include the main load block. For purposes of this specification, a deenergized main load block need not be considered a load.

3. Verifying that the HEPA filter banks remove ≥ 99% of the DOP when they are tested in-place in accordance with ANSI N510-1980 while operating the exhaust ventilation system at a flow rate of 30,000 cfm ± 10%.

4. Verifying within 31 days after removal that a laboratory analysis of a carbon sample from either at least one test canister or at least two carbon samples removed from one of the charcoal adsorbers demonstrates a removal efficiency of ≥ 90% for radioactive methyl iodide when the sample is tested in accordance with ANSI N510-1980 (130°C, 95% R.H.). The carbon samples not obtained from test canisters shall be prepared by either:

   (a) Emptying one entire 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, or

   (b) Emptying a longitudinal sample from an 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.

   Subsequent to reinstalling the adsorber tray used for obtaining the carbon sample, the system shall be demonstrated OPERABLE by also verifying that the charcoal adsorbers remove ≥ 99% of a halogenated hydrocarbon refrigerant test gas when they are tested in-place in accordance with ANSI N510-1980 while operating the ventilation system at a flow rate of 30,000 cfm ± 10%.

5. Verifying a system flow rate of 30,000 cfm ± 10% during system operation when tested in accordance with ANSI N510-1980.

c. After every 720 hours of charcoal adsorber operation by either:

1. Verifying within 31 days after removal that a laboratory analysis of a carbon sample obtained from a test canister demonstrates a removal efficiency of ≥ 90% for radioactive methyl iodide when the sample is tested in accordance with ANSI N510-1980 (130°C, 95% R.H.); or

2. Verifying within 31 days after removal that laboratory analyses of at least two carbon samples demonstrate a removal efficiency of ≥ 90% for radioactive methyl iodide when the samples are tested in accordance with ANSI N510-1980 (130°C, 95% R.H.) and the samples are prepared by either:

    a) Emptying one entire 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, or

    b) Emptying a longitudinal sample from an 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.

    Subsequent to reinstalling the adsorber tray used for obtaining the carbon sample, the system shall be demonstrated OPERABLE by also verifying that the charcoal adsorbers remove ≥ 99% of a halogenated hydrocarbon refrigerant test gas when they are tested in-place in accordance with ANSI N510-1980 while operating the ventilation system at a flow rate of 30,000 cfm ± 10%.

d. At least once per 18 months by:

1. Verifying that the pressure drop across the combined HEPA filters and charcoal adsorber banks is ≤ 6 inches Water Gauge while operating the exhaust ventilation system at a flow rate of 30,000 cfm ± 10%.

2. Deleted.

3. Verifying that on a high-radiation signal, the system automatically directs its exhaust flow through the charcoal adsorber banks and automatically shuts down the storage pool ventilation system supply fans.

4. Verifying that the exhaust ventilation system maintains the spent fuel storage pool area at a negative pressure of ≥ 1/8 inches Water Gauge relative to the outside atmosphere during system operation.

[illegible]

SURVEILLANCE REQUIREMENTS (Continued)

e. After each complete or partial replacement of a HEPA filter bank by verifying that the HEPA filter banks remove $\geq$ 99% of the DOP when they are tested in-place in accordance with ANSI N510-1980 while operating the ventilation system at a flow rate of 30,000 cfm $\pm$ 10%.

f. After each complete or partial replacement of a charcoal adsorber bank by verifying that the charcoal adsorbers remove $\geq$ 99% of a halogenated hydrocarbon refrigerant test gas when they are tested in-place in accordance with ANSI N510-1980 while operating the ventilation system at a flow rate of 30,000 cfm $\pm$ 10%.

3/4.7.5 CONTROL ROOM EMERGENCY VENTILATION SYSTEM

The OPERABILITY of the control room emergency ventilation system ensures that 1) the ambient air temperature does not exceed the allowable temperature for continuous duty rating for the equipment and instrumentation cooled by this system and 2) the control room will remain habitable for operations personnel during and following all credible accident conditions. The OPERABILITY of this system in conjunction with control room design provisions is based on limiting the radiation exposure to personnel occupying the control room to 5 rem or less whole body, or its equivalent. This limitation is consistent with the requirements of General Design Criterion 19 of Appendix "A", 10 CFR 50.

3/4.7.6 ESF VENTILATION SYSTEM

The OPERABILITY of the ESF ventilation system ensures that adequate cooling is provided for ECCS equipment and that radioactive materials leaking from the ECCS equipment within the pump rooms following a LOCA are filtered prior to reaching the environment. The operation of this system and the resultant effect on offsite dosage calculations were assumed in the accident analyses.

The 1980 version of ANSI N510 is used as a testing guide. This standard, however, is intended to be rigorously applied only to systems which, unlike the ESF ventilation system, are designed to ANSI N509 standards. For the specific case of the air-aerosol mixing uniformity test required by ANSI N510 as a prerequisite to in-place leak testing of charcoal and HEPA filters, the air-aerosol uniform mixing test acceptance criteria were not rigorously met. For this reason, a statistical correction factor will be applied to applicable surveillance test results where required.

3/4.7.7 SEALED SOURCE CONTAMINATION

The limitations on sealed source removable contamination ensure that the total body or individual organ irradiation does not exceed allowable limits in the event of ingestion or inhalation of the probable leakage from the source material. The limitations on removable contamination for sources requiring leak testing, including alpha emitters, are based on 10 CFR 70.39(c) limits for plutonium. Quantities of interest to this specification which are exempt from the leakage testing are consistent with the criteria of 10 CFR Parts 30.11-20 and 70.19. Leakage from sources excluded from the requirements of this specification is not likely to represent more than one maximum permissible body burden for total body irradiation if the source material is inhaled or ingested.

3/4.9.10 AND 3/4.9.11 WATER LEVEL - REACTOR VESSEL AND STORAGE POOL

The restrictions on minimum water level ensure that sufficient water depth is available to remove 99% of the assumed 10% iodine gap activity released from the rupture of an irradiated fuel assembly. The minimum water depth is consistent with the assumptions of the accident analysis. Water level above the vessel flange in MODE 6 will vary as the reactor vessel head and the system internals are removed. The 23 feet of water are required before any subsequent movement of fuel assemblies or control rods.

3/4.9.12 STORAGE POOL VENTILATION SYSTEM

The limitations on the storage pool ventilation system ensure that all radioactive material released from an irradiated fuel assembly will be filtered through the HEPA filters and charcoal adsorber prior to discharge to the atmosphere. The OPERABILITY of this system and the resulting iodine removal capacity are consistent with the assumptions of the accident analyses.

The 1980 version of ANSI N510 is used as a testing guide. This standard, however, is intended to be rigorously applied only to systems which, unlike the storage pool ventilation system, are designed to ANSI N509 standards. For the specific case of the air-aerosol mixing uniformity test required by ANSI N510 as a prerequisite to in-place leak testing of charcoal and HEPA filters, the air-aerosol uniform mixing test acceptance criteria were not rigorously met. For this reason, a statistical correction factor will be applied to applicable surveillance test results where required.

In order to maintain the minimum negative pressure required by Technical Specifications (1/8 inch W.G.) during movement of fuel within the storage pool or during crane operation with loads over the pool, the crane bay roll-up door and the drumming room roll-up door, located on the 609-foot elevation of the auxiliary building, must be closed. However, they may be opened during these operations under administrative control. If the crane bay door needs to be opened during fuel movement, an example of an administrative control might be to station an individual at the door who would be in communication with personnel in the spent fuel pool area and could open the door when passage was completed or in the event of an emergency. For the drumming room door, an example of an administrative control might be to require the door to be reclosed after normal ingress and egress of personnel or material, or to station an individual at the door if the door needs to remain open for an extended period of time.

Should the doors become blocked or stuck open while under administrative control, Technical Specification requirements will not be considered to be violated provided the Action Statement requirements of Specification 3.9.12 are expeditiously followed, i.e., movement of fuel within the storage pool or crane operation with loads over the pool is expeditiously suspended.

3/4.9.13 SPENT FUEL CASK MOVEMENT

The limitations of this specification ensure that, during insertion or removal of spent fuel casks from the spent fuel pool, fuel cask movement will be constrained to the path and lift height assumed in the Cask Drop Protection System safety analysis. Restricting the spent fuel cask movement within these requirements provides protection for the spent fuel pool and stored fuel from the effects of a fuel cask drop accident.

3/4.9.14 SPENT FUEL CASK DROP PROTECTION SYSTEM

The limitations on the use of spent fuel casks weighing in excess of 110 tons (nominal) provide assurance that the spent fuel pool would not be damaged by a dropped fuel cask since this weight is consistent with the assumptions used in the safety analysis for the performance of the Cask Drop Protection System.

3/4.7.6 ESF VENTILATION SYSTEM

LIMITING CONDITION FOR OPERATION

3.7.6.1 Two independent ESF ventilation system exhaust air filter trains shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

With one ESF ventilation system exhaust air filter train inoperable, restore the inoperable train to OPERABLE status within 7 days or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

4.7.6.1 Each ESF ventilation system exhaust air filter train shall be demonstrated OPERABLE:

a. At least once per 31 days on a STAGGERED TEST BASIS by initiating, from the control room, flow through the HEPA filter and charcoal adsorber train and verifying that the train operates for at least 15 minutes.

b. At least once per 18 months or (1) after any structural maintenance on the HEPA filter or charcoal adsorber housings, or (2) following painting, fire or chemical release in any ventilation zone communicating with the system, by:

   1. Deleted.

   2. Verifying that the charcoal adsorbers remove $\geq$ 99% of a halogenated hydrocarbon refrigerant test gas when they are tested in-place in accordance with ANSI N510-1980 while operating the ventilation system at a flow rate of 25,000 cfm $\pm$ 10%.

   3. Verifying that the HEPA filter banks remove $\geq$ 99% of the DOP when they are tested in-place in accordance with ANSI N510-1980 while operating the ventilation system at a flow rate of 25,000 cfm $\pm$ 10%.

[illegible]

4. Verifying within 31 days after removal that a laboratory analysis of a carbon sample from either at least one test canister or at least two carbon samples removed from one of the charcoal adsorbers demonstrates a removal efficiency of ≥ 90% for radioactive methyl iodide when the sample is tested in accordance with ANSI N510-1980 (130°C, 95% R.H.). The carbon samples not obtained from test canisters shall be prepared by either:

   a) Emptying one entire 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, or

   b) Emptying a longitudinal sample from an 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.

   Subsequent to reinstalling the adsorber tray used for obtaining the carbon sample, the system shall be demonstrated OPERABLE by also verifying that the charcoal adsorbers remove ≥ 99% of a halogenated hydrocarbon refrigerant test gas when they are tested in-place in accordance with ANSI N510-1980 while operating the ventilation system at a flow rate of 25,000 cfm ± 10%.

5. Verifying a system flow rate of 25,000 cfm ± 10% during system operation when tested in accordance with ANSI N510-1980.

c. After every 720 hours of charcoal adsorber operation by either:

1. Verifying within 31 days after removal that a laboratory analysis of a carbon sample obtained from a test canister demonstrates a removal efficiency of ≥ 90% for radioactive methyl iodide when the sample is tested in accordance with ANSI N510-1980 (130°C, 95% R.H.); or

2. Verifying within 31 days after removal that laboratory analyses of at least two carbon samples demonstrate a removal efficiency of ≥ 90% for radioactive methyl iodide when the samples are tested in accordance with ANSI N510-1980 (130°C, 95% R.H.) and the samples are prepared by either:

   a) Emptying one entire 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, or

b) Emptying a longitudinal sample from an 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.

Subsequent to reinstalling the adsorber tray used for obtaining the carbon sample, the system shall be demonstrated OPERABLE by also verifying that the charcoal adsorbers remove ≥ 99% of a halogenated hydrocarbon refrigerant test gas when they are tested in-place in accordance with ANSI N510-1980 while operating the ventilation system at a flow rate of 25,000 cfm ± 10%.

d. At least once per 18 months by:

1. 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 25,000 cfm ± 10%.

2. Deleted.

3. Verifying that the standby fan starts automatically on a Containment Pressure--High-High Signal and directs its exhaust flow through the HEPA filters and charcoal adsorber banks on a Containment Pressure--High-High Signal.

e. After each complete or partial replacement of a HEPA filter bank by verifying that the HEPA filter banks remove ≥ 99% of the DOP when they are tested in-place in accordance with ANSI N510-1980 while operating the ventilation system at a flow rate of 25,000 cfm ± 10%.

f. After each complete or partial replacement of a charcoal adsorber bank by verifying that the charcoal adsorbers remove ≥ 99% of a halogenated hydrocarbon refrigerant test gas when they are tested in-place in accordance with ANSI N510-1980 while operating the ventilation system at a flow rate of 25,000 cfm ± 10%.

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REFUELING OPERATIONS

STORAGE POOL VENTILATION SYSTEM**

LIMITING CONDITION FOR OPERATION

3.9.12 The spent fuel storage pool exhaust ventilation system shall be OPERABLE.

APPLICABILITY: Whenever irradiated fuel is in the storage pool.

ACTION:

a. With no fuel storage pool exhaust ventilation system OPERABLE, suspend all operations involving movement of fuel within the storage pool or crane operation with loads over the storage pool+ until at least one spent fuel storage pool exhaust ventilation system is restored to OPERABLE status.*

b. The provisions of Specifications 3.0.3 and 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.9.12 The above required fuel storage pool ventilation system shall be demonstrated OPERABLE:

a. At least once per 31 days by initiating flow through the HEPA filter and charcoal adsorber train and verifying that the train operates for at least 15 minutes.

b. At least once per 18 months or (1) after any structural maintenance on the HEPA filter or charcoal adsorber housings, or (2) following painting, fire or chemical release in any ventilation zone communicating with the system, by:

   1. Deleted.

   2. Verifying that the charcoal adsorbers remove $\geq$ 99% of a halogenated hydrocarbon refrigerant test gas when they are tested in-place in accordance with ANSI N510-1980 while operating the exhaust ventilation system at a flow rate of 30,000 cfm $\pm$ 10%.

* The crane bay roll-up door and the drumming room roll-up door may be opened under administrative control during movement of fuel within the storage pool or crane operation with loads over the storage pool.

** Shared system with D. C. COOK - UNIT 1.

\+ This does not include the main load block. For purposes of this specification, a deenergized main load block need not be considered a load.

SURVEILLANCE REQUIREMENTS (Continued)

3. Verifying that the HEPA filter banks remove $\geq$ 99% of the DOP when they are tested in-place in accordance with ANSI N510-1980 while operating the exhaust ventilation system at a flow rate of 30,000 cfm $\pm$ 10%.

4. Verifying within 31 days after removal that a laboratory analysis of a carbon sample from either at least one test canister or at least two carbon samples removed from one of the charcoal adsorbers demonstrates a removal efficiency of $\geq$ 90% for radioactive methyl iodide when the sample is tested in accordance with ANSI N510-1980 (130°C, 95% R.H.). The carbon samples not obtained from test canisters shall be prepared by either:

   (a) Emptying one entire 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, or

   (b) Emptying a longitudinal sample from an 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.

   Subsequent to reinstalling the adsorber tray used for obtaining the carbon sample, the system shall be demonstrated OPERABLE by also verifying that the charcoal adsorbers remove $\geq$ 99% of a halogenated hydrocarbon refrigerant test gas when they are tested in-place in accordance with ANSI N510-1980 while operating the ventilation system at a flow rate of 30,000 cfm $\pm$ 10%.

5. Verifying a system flow rate of 30,000 cfm $\pm$ 10% during system operation when tested in accordance with ANSI N510-1980.

c. After every 720 hours of charcoal adsorber operation by either:

1. Verifying within 31 days after removal that a laboratory analysis of a carbon sample obtained from a test canister demonstrates a removal efficiency of $\geq$ 90% for radioactive methyl iodide when the sample is tested in accordance with ANSI N510-1980 (130°C, 95% R.H.); or

2. Verifying within 31 days after removal that laboratory analyses of at least two carbon samples demonstrate a removal efficiency of ≥ 90% for radioactive methyl iodide when the samples are tested in accordance with ANSI N510-1980 (130°C, 95% R.H.) and the samples are prepared by either:

   a) Emptying one entire 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, or

   b) Emptying a longitudinal sample from an 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.

   Subsequent to reinstalling the adsorber tray used for obtaining the carbon sample, the system shall be demonstrated OPERABLE by also verifying that the charcoal adsorbers remove ≥ 99% of a halogenated hydrocarbon refrigerant test gas when they are tested in-place in accordance with ANSI N510-1980 while operating the ventilation system at a flow rate of 30,000 cfm ± 10%.

d. At least once per 18 months by:

   1. Verifying that the pressure drop across the combined HEPA filters and charcoal adsorber banks is ≤ 6 inches Water Gauge while operating the exhaust ventilation system at a flow rate of 30,000 cfm ± 10%.

   2. Deleted.

   3. Verifying that on a high-radiation signal, the system automatically directs its exhaust flow through the charcoal adsorber banks and automatically shuts down the storage pool ventilation system supply fans.

   4. Verifying that the exhaust ventilation system maintains the spent fuel storage pool area at a negative pressure of ≥ 1/8 inches Water Gauge relative to the outside atmosphere during system operation.

SURVEILLANCE REQUIREMENTS (Continued)

e. After each complete or partial replacement of a HEPA filter bank by verifying that the HEPA filter banks remove $\geq$ 99% of the DOP when they are tested in-place in accordance with ANSI N510-1980 while operating the ventilation system at a flow rate of 30,000 cfm $\pm$ 10%.

f. After each complete or partial replacement of a charcoal adsorber bank by verifying that the charcoal adsorbers remove $\geq$ 99% of a halogenated hydrocarbon refrigerant test gas when they are tested in-place in accordance with ANSI N510-1980 while operating the ventilation system at a flow rate of 30,000 cfm $\pm$ 10%.

3/4.7.6 ESF VENTILATION SYSTEM

The OPERABILITY of the ESF ventilation system ensures that adequate cooling is provided for ECCS equipment and that radioactive materials leaking from the ECCS equipment within the pump rooms following a LOCA are filtered prior to reaching the environment. The operation of this system and the resultant effect on offsite dosage calculations were assumed in the accident analyses.

The 1980 version of ANSI N510 is used as a testing guide. This standard, however, is intended to be rigorously applied only to systems which, unlike the ESF ventilation system, are designed to ANSI N509 standards. For the specific case of the air-aerosol mixing uniformity test required by ANSI N510 as a prerequisite to in-place leak testing of charcoal and HEPA filters, the air-aerosol uniform mixing test acceptance criteria were not rigorously met. For this reason, a statistical correction factor will be applied to applicable surveillance test results where required.

3/4.7.7 HYDRAULIC SNUBBERS

All snubbers are required OPERABLE to ensure that the structural integrity of the reactor coolant system and all other safety related systems is maintained during and following a seismic or other event initiating dynamic loads. Snubbers excluded from this inspection program are those installed on nonsafety-related systems and then only if their failure, or failure of the system on which they are installed, would have no adverse effect on any safety-related system.

The visual inspection frequency is based upon maintaining a constant level of snubber protection to systems. Therefore, the required inspection interval varies inversely with the observed snubber failures and is determined by the number of inoperable snubbers found during an inspection. Inspections performed before that interval has elapsed may be used as a new reference point to determine the next inspection. However, the results of such early inspections performed before the original required time interval has elapsed (nominal time less 25%) may not be used to lengthen the required inspection interval. Any inspection whose results required a shorter inspection interval will override the previous schedule.

When the cause of the rejection of a snubber is clearly established and remedied for that snubber and for any other snubbers that may be generically susceptible, and verified by inservice functional testing, that snubber may be exempted from being counted as inoperable. Generically susceptible snubbers are those which are of a specific make or model and have the same design features directly related to rejection of the snubber by visual inspection, or are similarly located or exposed to the same environmental conditions such as temperature, radiation, and vibration.

When a snubber is found inoperable, an engineering evaluation is performed, in addition to the determination of the snubber mode of failure, in order to determine if any safety-related component or system has been adversely affected by the inoperability of the snubber. The engineering evaluation shall determine whether or not the snubber mode of failure has imparted a significant effect or degradation on the supported component or system.

To provide assurance of snubber functional reliability, a representative sample of the installed snubbers will be functionally tested during plant shutdowns at 18-month intervals. Observed failures of these sample snubbers shall require functional testing of additional units.

The service life of a snubber is evaluated via manufacturer's input and information through consideration of the snubber service conditions and associated installation and maintenance records (newly installed snubber, seal replaced, spring replaced, in high radiation area, in high temperature area, etc...). The requirement to monitor the snubber service life is included to insure that the snubbers periodically undergo a performance evaluation in view of their age and operating conditions. These records will provide statistical bases for future consideration of snubber service life. The requirements for the maintenance of records and the snubber service life review are not intended to affect plant operation.

3/4.7.8 SEALED SOURCE CONTAMINATION

The limitations on removable contamination for sources requiring leak testing, including alpha emitters, are based on 10 CFR 70.39(c) limits for plutonium. These limitations ensure that leakage from byproduct, source, and special nuclear material sources will not exceed allowable intake values.

3/4.7.9 FIRE SUPPRESSION SYSTEMS

The OPERABILITY of the fire suppression systems ensures that adequate fire suppression capability is available to confine and extinguish fires occurring in any portion of the facility where safety related equipment is located. The fire suppression system consists of the water system, spray and/or sprinklers, CO_2, Halon and fire hose stations. The collective capability of the fire suppression systems is adequate to minimize potential damage to safety related equipment and is a major element in the facility fire protection program.

In the event that one or more of the required low pressure CO_2 systems are isolated for personnel protection, to permit entry for routine tours, maintenance, construction or surveillance testing, the fire detection system(s) required by specification 3.3.3.8 shall be verified to be operable and a Roving Fire Watch Patrol established in the affected areas not occupied by workers. The Roving Fire Watch Patrol(s) shall consist of one or more persons knowledgeable of the location and operation of the fire fighting equipment and good fire protection/personnel safety practices such as maintenance of access and egress routes and personnel accountability measures. The functions of the Roving Fire Watch Patrol can be fulfilled by personnel involved in

3/4.9.9 CONTAINMENT PURGE AND EXHAUST ISOLATION SYSTEM

The OPERABILITY of this system ensures that the containment vent and purge penetrations will be automatically isolated upon detection of high radiation levels within the containment. The OPERABILITY of this system is required to restrict the release of radioactive material from the containment atmosphere to the environment.

3/4.9.10 AND 3/4.9.11 WATER LEVEL - REACTOR VESSEL AND STORAGE POOL

The restrictions on minimum water level ensure that sufficient water depth is available to remove 99% of the assumed 10% iodine gap activity released from the rupture of an irradiated fuel assembly. The minimum water depth is consistent with the assumptions of the accident analysis. Water level above the vessel flange in MODE 6 will vary as the reactor vessel head and the system internals are removed. The 23 feet of water are required before any subsequent movement of fuel assemblies or control rods.

3/4.9.12 STORAGE POOL VENTILATION SYSTEM

The limitations on the storage pool ventilation system ensure that all radioactive material released from an irradiated fuel assembly will be filtered through the HEPA filters and charcoal adsorber prior to discharge to the atmosphere. The OPERABILITY of this system and the resulting iodine removal capacity are consistent with the assumptions of the accident analyses.

The 1980 version of ANSI N510 is used as a testing guide. This standard, however, is intended to be rigorously applied only to systems which, unlike the storage pool ventilation system, are designed to ANSI N509 standards. For the specific case of the air-aerosol mixing uniformity test required by ANSI N510 as a prerequisite to in-place leak testing of charcoal and HEPA filters, the air-aerosol uniform mixing test acceptance criteria were not rigorously met. For this reason, a statistical correction factor will be applied to applicable surveillance test results where required.

In order to maintain the minimum negative pressure required by Technical Specifications (1/8 inch W.G.) during movement of fuel within the storage pool or during crane operation with loads over the pool, the crane bay roll-up door and the drumming room roll-up door, located on the 609-foot elevation of the auxiliary building, must be closed. However, they may be opened during these operations under administrative control. If the crane bay door needs to be opened during fuel movement, an example of an administrative control might be to station an individual at the door who would be in communication with personnel in the spent fuel pool area and could open the door when passage was completed or in the event of an emergency. For the drumming room door, an example of an administrative control might be to require the door to be reclosed after normal ingress and egress of personnel or material, or to station an individual at the door if the door needs to remain open for an extended period of time.

Should the doors become blocked or stuck open while under administrative control, Technical Specification requirements will not be considered to be violated provided the Action Statement requirements of Specification 3.9.12 are expeditiously followed, i.e., movement of fuel within the storage pool or crane operation with loads over the pool is expeditiously suspended.

3/4.9.13 SPENT FUEL CASK MOVEMENT

The limitations of this specification ensure that, during insertion or removal of spent fuel casks from the spent fuel pool, fuel cask movement will be constrained to the path and lift height assumed in the Cask Drop Protection System safety analysis. Restricting the spent fuel cask movement within these requirements provides protection for the spent fuel pool and stored fuel from the effects of a fuel cask drop accident.

3/4.9.14 SPENT FUEL CASK DROP PROTECTION SYSTEM

The limitations on the use of spent fuel casks weighing in excess of 110 tons (nominal) provide assurance that the spent fuel pool would not be damaged by a dropped fuel cask since this weight is consistent with the assumptions used in the safety analysis for the performance of the Cask Drop Protection System.

Attachment 3 to AEP:NRC:0959

Letter from Mr. John R. Hunt
Dated August 7, 1985

UCLEAR ONTAINMENT YSTEMS, INC.
NCS 4555 GROVES ROAD • NO. 41/42 • COLUMBUS, OHIO 43232 • 614-864-7613

August 7, 1985

Mr. Jeff St. Amand
D.C. Cook Nuclear Plant
P.O. Box 458
Bridgman, Michigan 49106

Dear Jeff,

Regarding the results of your air-aerosol mixing test on 1-AES-1 (ESF Fan) which I witnessed on July 26, 1985, I have the following comments:

1) In my opinion, you have optimized the location of the injection port and technique of injection for this system. Addition of baffling or other attempts to enhance the air-aerosol mixing would be fruitless.

2) Your test results show conclusively that each area in the sampling plane upstream of the HEPA filter bank is being adequately challenged. While certain individual recordings differ from the mean concentration by somewhat more than ±20%, the intent, though not the letter of ANSI N510-80 is certainly being met.

3) In my opinion, a more thorough and exacting air-aerosol test could not have been performed on the subject system. The deviations which your data show are undoubtedly the result of a great many factors, including deviations inherent in the test method itself.

4) ANSI N510-80 does not offer adequate guidance in this area. Theoretically, if a system were proper designed to ANSI N509(-76,-80), the system would by definition" (though not by rigorous supporting engineering criteria) meet the acceptance values specified in ANSI N510. Since an error analysis of ANSI N510 to test the method itself has not been performed, the effects of certain deviations have not been quantified.

Since 1-AES-1 is certainly not an ANSI N509 system, and since ANSI N510-80 is meant to be applied as a guideline with respect to non-ANSI N509 systems, I would have no qualms applying ANSI N510 (-75 or -80) in this spirit.

5) Applying a correction factor to your single point upstream DOP sample concentration in a conservative direction (ie; effectively decreasing the upstream concentration value used in your final leak calculation) based upon your air-aerosol data will most certainly result in a very conservative test.

If you have any questions, please let me know, I would be happy to help you in any way I can.

Sincerely yours,

John R. Hunt

John R. Hunt
Nuclear Containment Systems, Inc.

Attachment 4 to AEP:NRC:0959

Methodology for Developing

Air-Aerosol Mixing Uniformity

Test Correction Factors

Correction Factor Methodology

The correction factor for each filter unit is derived from data obtained from performance of an air-aerosol mixing uniformity test similar to that recommended by Section 9 of ANSI N510-1980. (Because the ventilation units are not of ANSI N509 design, literal compliance with all the ANSI N510 Section 9 requirements could not be achieved).

DOP concentration was measured in a sample plane located in the ductwork upstream of the HEPA filter section, using a penetrometer. The sample plane was divided into a number of equal areas identical to the number and arrangement of the individual HEPA filters. The concentration measurement was made in the center of each area. For every measurement taken in the sample plane, an additional measurement was taken at the normal upstream sample point used in performing T/S required leak testing for the HEPA filters and charcoal adsorbers.

The measurement sets were repeated three times, and the average value for each location calculated. The standard error of each of the two means was then determined, in accordance with Step 5 of ANSI N510, Section 11.4 and the 95% confidence level for each determined as in Step 6 of ANSI N510 Section 11.4. From this data, a correction factor was determined which is the correction necessary to achieve equality between the most limiting values of the 95% confidence levels for each of the two means. This factor is obtained by dividing the lower-limit 95% confidence level concentration at the upstream sample matrix into the upper-limit 95% confidence level concentration at the normal upstream single sample point. This factor is then multiplied by the penetration determined using in-place leak testing. If the correction factor for a particular ventilation unit was determined to be less than 1.0, 1.0 was used.

Consider the following example:

Figure 1 illustrates a filter system not constructed to the criteria of ANSI-N509. The testing method described above has been utilized and measurements taken in sampling plane A-A, as well as at the normal upstream sample point, give the following data:

X/Y where:

X = % concentration in sampling Plane A-A.
Y = % concentration at normal upstream sample point.

Note: Data presented in matrix format for clarity as illustrated below:

Section A-A Point Designations

1	2	3	4	5	6
7	8	9	10	11	12
13	14	15	16	17	18
19	20	21	22	23	24

Trial #1

38/36	39/35	38/36	37/42	24/36	19/35
32/36	38/39	30/34	34/34	30/35	24/38
23/34	28/35	29/34	29/37	29/36	28/36
25/36	25/40	26/35	26/34	24/34	22/32

Trial #2

41/39	40/38	41/37	40/40	29/37	22/36
32/35	39/35	28/40	33/41	27/34	22/36
22/37	30/34	24/36	28/38	30/40	25/35
25/37	26/36	26/34	24/37	24/32	21/33

Trial #3

39/42	46/37	44/33	40/40	27/36	21/36
35/39	39/38	27/39	32/36	27/37	24/35
25/35	28/40	29/34	29/34	27/36	27/33
26/34	26/36	28/33	26/37	25/35	23/34

Average Values For 3 Trials

39.3/39.0	41.7/36.7	41.0/35.3	39.0/40.7	26.7/36.3	20.7/35.7
33.0/36.7	38.7/37.3	28.3/37.7	33.0/37.0	28.0/35.3	23.3/36.3
23.3/35.3	28.7/36.3	27.3/34.7	28.7/36.3	28.7/37.3	26.7/34.7
25.3/35.7	25.7/37.3	26.7/34.0	25.3/36.0	24.3/33.7	22.0/33.0

Calculating The Average Values Gives:

Average Value for points in sample matrix = $\bar{X}$ = 29.39

Average Value for normal upstream sample pt. = $\bar{Y}$ = 36.18

Next find the standard error of both samples based on the average values for 3 trials:

$$S\bar{x} = \left[\frac{\Sigma_1^n (Xi - \bar{X})^2}{n\ (n-1)}\right]^{\frac{1}{2}} \quad \text{and} \quad S\bar{y} = \left[\frac{\Sigma_1^n (Yi - \bar{Y})^2}{n\ (n-1)}\right]^{\frac{1}{2}}$$

Xi	Xi - $\overline{X}$	$(Xi - \overline{X})^2$	Yi	Yi - $\overline{Y}$	$(Yi - \overline{Y})^2$
39.3	9.91	98.21	39.0	2.82	7.95
41.7	12.31	151.54	36.7	0.52	0.27
41.0	11.61	134.79	35.3	-0.88	0.77
39.0	9.61	92.35	40.7	4.52	20.43
26.7	-2.69	7.24	36.3	0.12	0.01
20.7	-8.69	75.52	35.7	-0.48	0.23
33.0	3.61	13.03	36.7	0.52	0.27
38.7	9.31	86.68	37.3	1.12	1.25
28.3	-1.09	1.19	37.7	1.52	2.31
33.0	3.61	13.03	37.0	0.82	0.67
28.0	-1.39	1.93	35.3	-0.88	0.77
23.3	-6.09	37.09	36.3	0.12	0.01
23.3	-6.09	37.09	35.3	-0.88	0.77
28.7	-0.69	0.48	36.3	0.12	0.01
27.3	-2.09	4.37	34.7	-1.48	2.19
28.7	-0.69	0.48	36.3	0.12	0.01
28.7	-0.69	0.48	37.3	1.12	1.25
26.7	-2.69	7.24	34.7	-1.48	2.19
25.3	-4.09	16.73	35.7	-0.48	0.23
25.7	-3.69	13.62	37.3	1.12	1.25
26.7	-2.69	7.24	34.0	-2.18	4.75
25.3	-4.09	16.73	36.0	-0.18	0.03
24.3	-5.09	25.91	33.7	-2.48	6.15
22.0	-7.39	54.61	33.0	-3.18	10.11
		Σ = 897.58			Σ = 68.88

$$S\overline{x} = \left[\frac{897.58}{24(23)}\right]^{1/2} = \underline{1.28} \quad \text{and} \quad S\overline{y} = \left[\frac{63.88}{24(23)}\right]^{1/2} = \underline{0.34}$$

Next, calculate the 95% confidence levels based upon the t distribution, as shown in step 6 of ANSI N510, section 11.4:

$$P_{95} = X \pm t\,S\overline{x} \quad \text{and} \quad P_{95} = Y \pm t\,S\overline{y}$$

$$= 29.39 \pm (2.0)\ 1.28 \qquad\qquad = 36.18 \pm (2.0)\ 0.34$$

$$P_{95} = 31.95 \text{ and } 26.83 \qquad\qquad P_{95} = 36.86 \text{ and } 35.50$$

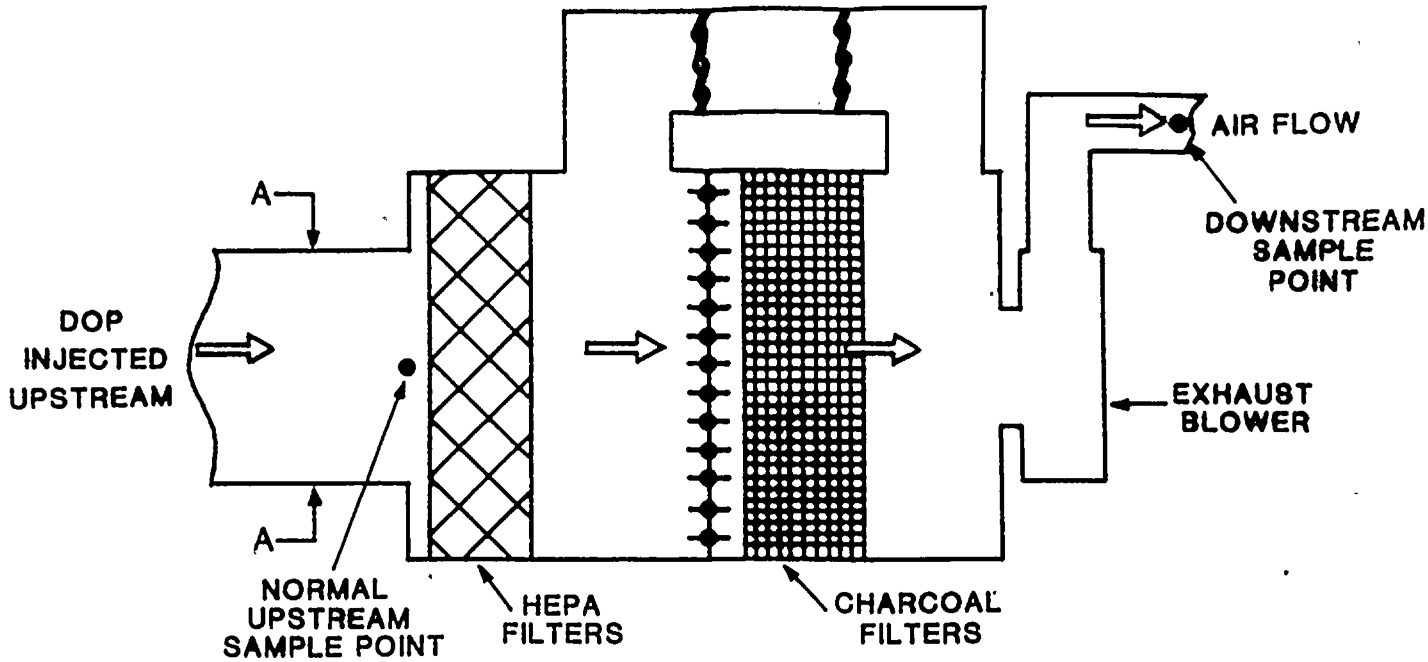
The most limiting relationship between the 95% confidence values is when X is at a minimum and Y is at a maximum. The correction factor, C_f, in this example is thus:

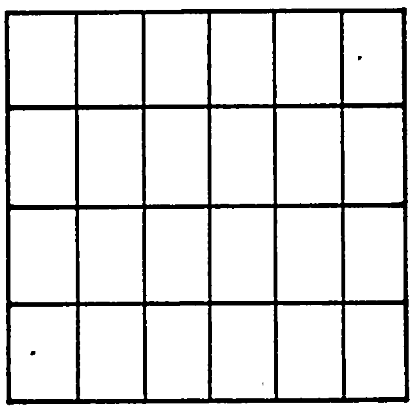
$$C_f = \frac{36.86}{26.83} = 1.37$$

The correction factor is used in the penetration calculation in the following manner:

$$P = 100 \frac{C_d}{C_u} (C_f)$$

Where: P = Penetration, %
C_d = Downstream tracer concentration
C_u = Upstream tracer concentration





ALL AREAS EQUAL SIZE

SECTION A-A
SAMPLING PLANE

SAMPLES TAKEN
IN CENTER
OF EACH AREA

FIGURE 1

[illegible]