ATTACHMENT 2 TO AEP:NRC:0856 O

PROPOSED CHANGES TO THE

DONALD C. COOK NUCLEAR PLANT

UNIT NOS. 1 AND 2

TECHNICAL SPECIFICATIONS

INSTRUMENTATION

CHLORINE DETECTION SYSTEM

LIMITING CONDITION FOR OPERATION

3.3.3.11 The chlorine detection system, with its alarm setpoint adjusted to actuate at a chlorine concentration of less than or equal to 5 ppm, shall be OPERABLE.

APPLICABILITY: All MODES.

ACTION:

a. With the chlorine detection system of either unit inoperable, within 1 hour initiate and maintain operation of both the Unit 1 and Unit 2 control room emergency ventilation systems in the isolation mode of operation, as defined in the Bases.

b. The provisions of Specifications 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.3.3.11 The chlorine detection system shall be demonstrated OPERABLE by performance of a CHANNEL FUNCTIONAL TEST at least once per 31 days and a CHANNEL CALIBRATION at least once per 18 months.

PLANT SYSTEMS

3/4.7.5 CONTROL ROOM EMERGENCY VENTILATION SYSTEM

LIMITING CONDITION FOR OPERATION

3.7.5.1 The control room emergency ventilation system shall be OPERABLE with:

a. Two independent heating and cooling systems,

b. Two independent pressurization fans,

c. One charcoal adsorber and HEPA filter train, and

d. The control room pressure boundary.

APPLICABILITY: All MODES.

ACTION: MODES 1, 2, 3, and 4:

a. With one heating and cooling system inoperable, restore the inoperable system 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.

b. With one pressurization fan inoperable, restore the inoperable fan 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.

c. With the filter train inoperable, restore the filter train to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

d. With the control room pressure boundary inoperable, restore the control room pressure boundary to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

MODES 5 and 6:

e. With any of the following: (1) both heating and cooling systems; (2) both pressurization fans; (3) the filter train; (4) the control room pressure boundary; inoperable, suspend all operations involving CORE ALTERATIONS or positive reactivity changes.

SURVEILLANCE REQUIREMENTS

4.7.5.1 The control room emergency ventilation system shall be demonstrated OPERABLE:

a. At least once per 12 hours by verifying that the control room air temperature is $\leq 120^{\circ}F$.

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

c. 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. 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 6000 cfm $\pm$ 10%.

2. 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 6000 cfm $\pm$ 10%.

3. 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 $\geq$ 95% for radioactive methyl iodide when the sample is tested in accordance with ANSI N510-1980 ($130^{\circ}C$, 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 6000 cfm $\pm$ 10%.

4. Verifying a system flow rate of 6000 cfm $\pm$ 10% during system operation in the recirculation/cleanup mode, when tested in accordance with ANSI N510-1980.

d. 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 $\geq$ 95% 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 a laboratory analysis of at least two carbon samples demonstrates a removal efficiency of $\geq$ 95% 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 $\geq$ 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 6000 cfm $\pm$ 10%.

SURVEILLANCE REQUIREMENTS (Continued)

e. 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 (W.G.) while operating the ventilation system at a flow rate of 6000 cfm ± 10%.

2. a) Verifying that on a Safety Injection Signal from Unit 1, the system automatically initiates operation in the recirculation/cleanup mode.

b) Verifying that on a Safety Injection Signal from Unit 2, the system automatically initiates operation in the recirculation/cleanup mode.

3. Verifying that the system maintains the control room at a positive pressure of ≥ 1/16 inch W.G. relative to the outside atmosphere at a system flow rate of 6000 cfm ± 10% while operating in the recirculation/cleanup mode.

4. Verifying that the system maintains the machine room and the P250 computer room at a positive pressure with respect to the outside atmosphere, in conjunction with testing required by Specification 4.7.5.1.e.3.

5. Verifying that the combination of filtered makeup and unfiltered inleakage is within limits, as defined in the Bases, which will maintain the control room habitable under radiological accident conditions, in conjunction with testing required by Specification 4.7.5.1.e.3.

f. 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 6000 cfm ± 10%.

g. 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 6000 cfm ± 10%.

3/4.3.3.9 RADIOACTIVE LIQUID EFFLUENT INSTRUMENTATION

The radioactive liquid effluent instrumentation is provided to monitor and control, as applicable, the releases of radioactive materials in liquid effluents during actual or potential releases. The alarm/trip setpoints for these instruments shall be calculated in accordance with NRC approved methods in the ODCM to ensure that the alarm/trip will occur prior to exceeding the limits of 10 CFR Part 20. The OPERABILITY and use of this instrumentation is consistent with the requirements of General Design Criteria specified in Section 11.3 of the Final Safety Analysis Report for the Donald C. Cook Nuclear Plant.

3/4.3.3.10 RADIOACTIVE GASEOUS EFFLUENT INSTRUMENTATION

The radioactive gaseous effluent instrumentation is provided to monitor and control, as applicable, the releases of radioactive materials in gaseous effluents during actual or potential releases. The alarm/trip setpoints for these instruments shall be calculated in accordance with NRC approved methods in the ODCM to ensure that the alarm/trip will occur prior to exceeding the limits of 10 CFR Part 20. This instrumentation also includes provisions for monitoring the concentrations of potentially explosive gas mixtures in the waste gas holdup system. The OPERABILITY and use of this instrumentation is consistent with the requirements of General Design Criteria specified in Section 11.3 of the Final Safety Analysis Report for the Donald C. Cook Nuclear Plant.

3/4.3.3.11 CHLORINE DETECTION SYSTEM

The OPERABILITY of the detection system ensures that sufficient capability is available to promptly detect and initiate protective action in the event of an accidental chlorine release. In the event chlorine is detected, the control room ventilation system would be manually placed in the isolation mode of operation. This is accomplished by closing isolation dampers on the normal air intake and the toilet room exhaust. The pressurization fans are not run, to minimize the amount of contaminated outdoor air which enters the control room. The emergency air intake damper cannot be closed from the control room beyond the setting for the recirculation/cleanup mode. Thus, the recirculation damper is maintained closed so that contaminated air entering via the emergency intake passes through the charcoal adsorbers prior to entering the control room.

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 Criteria 19 of Appendix "A", 10 CFR 50.

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 control room ventilation systems, 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 unless future air-aerosol mixing tests justify the adequacy of filter leak testing methods.

In the event chlorine gas is detected, or if the chlorine detector of either unit is inoperable, the control room ventilation system is placed in the isolation mode of operation. This is accomplished by closing isolation dampers on the normal air intake and the toilet room exhaust. The pressurization fans are not run, to minimize the amount of contaminated outdoor air which enters the control room. The emergency air intake damper cannot be closed from the control room beyond the setting for the recirculation/cleanup mode. Thus, the recirculation damper is maintained closed so that contaminated air entering via the emergency intake passes through the charcoal adsorbers prior to entering the control room.

In the event of a radiological accident, such as a LOCA, the control room ventilation system would be aligned automatically in the recirculation/cleanup mode of operation. This occurs automatically in both units in the event of a safety injection signal from either unit. Upon system actuation the normal air intake and toilet room exhaust are automatically closed via isolation dampers. Both of the redundant pressurization fans start, drawing outdoor makeup air for pressurization purposes through the emergency intake damper. This damper is preset to a position sufficient to allow the required pressurization, while limiting outdoor air intake to an amount which will ensure control room habitability, as described below. The operators are instructed to shut off one of the redundant fans after assuring they both started. This is to assure that iodine residence time requirements are met, so as to provide filter efficiencies consistent with those assumed in the accident analyses.

Figure 1, and its accompanying Table 1, provide a graphic representation of the control room ventilation system under normal, radiological, and toxic gas conditions.

In the recirculation/cleanup mode, the ventilation system is sized to provide pressurization of $\geq$ 1/16 inches W.G. relative to the outside atmosphere. The machine room and P250 computer room are intended to be at pressures which are positive with respect to the outside atmosphere, but which may be less positive than the control room. The lower pressure requirement is because these rooms would not be expected to be entered or exited as often as the control room during an accident. Pressure in the P250 computer room would always be slightly higher than the machine room because of the small pressure drop associated with air passage through the transfer openings. Therefore, a positive pressure measurement in the machine room will ensure a positive pressure in the computer room.

Technical Specifications require verification that the combination of filtered and unfiltered inleakage is within limits which will maintain the control room habitable under radiological accident conditions. Acceptable combinations of inleakage are those that limit doses to control room personnel to 5 rem whole-body, 30 rem thyroid, or 30 rem to the skin under an assumed accident duration of 30 days. These combinations are derived from Figures 1 and 2. Dose lines on these figures may be extrapolated linearly to accommodate larger values of filtered or unfiltered inleakage. For purposes of using these figures, filtered air inleakage is taken to be that air which is brought in through the filter unit to provide makeup for pressurization purposes. Unfiltered makeup air is defined as the sum of air which is measured to leak past the normal air intake isolation damper, when it is in the closed position, and a nominal 10 cfm which accounts for opening and closing of the control room doors during the course of an accident.

To use the whole body and skin dose curves, the total makeup air flow rate is obtained by summing the filtered and unfiltered values obtained as described above, and verifying that the 30-day dose resulting from this total is below the limits shown. For the thyroid dose, a point on Figure 3 is found which corresponds to the appropriate filtered and unfiltered leakage combination. The 30-day dose associated with this point must be below the 30 rem thyroid dose limit.

FIGURE 1: **CONTROL ROOM VENTILATION SYSTEM**

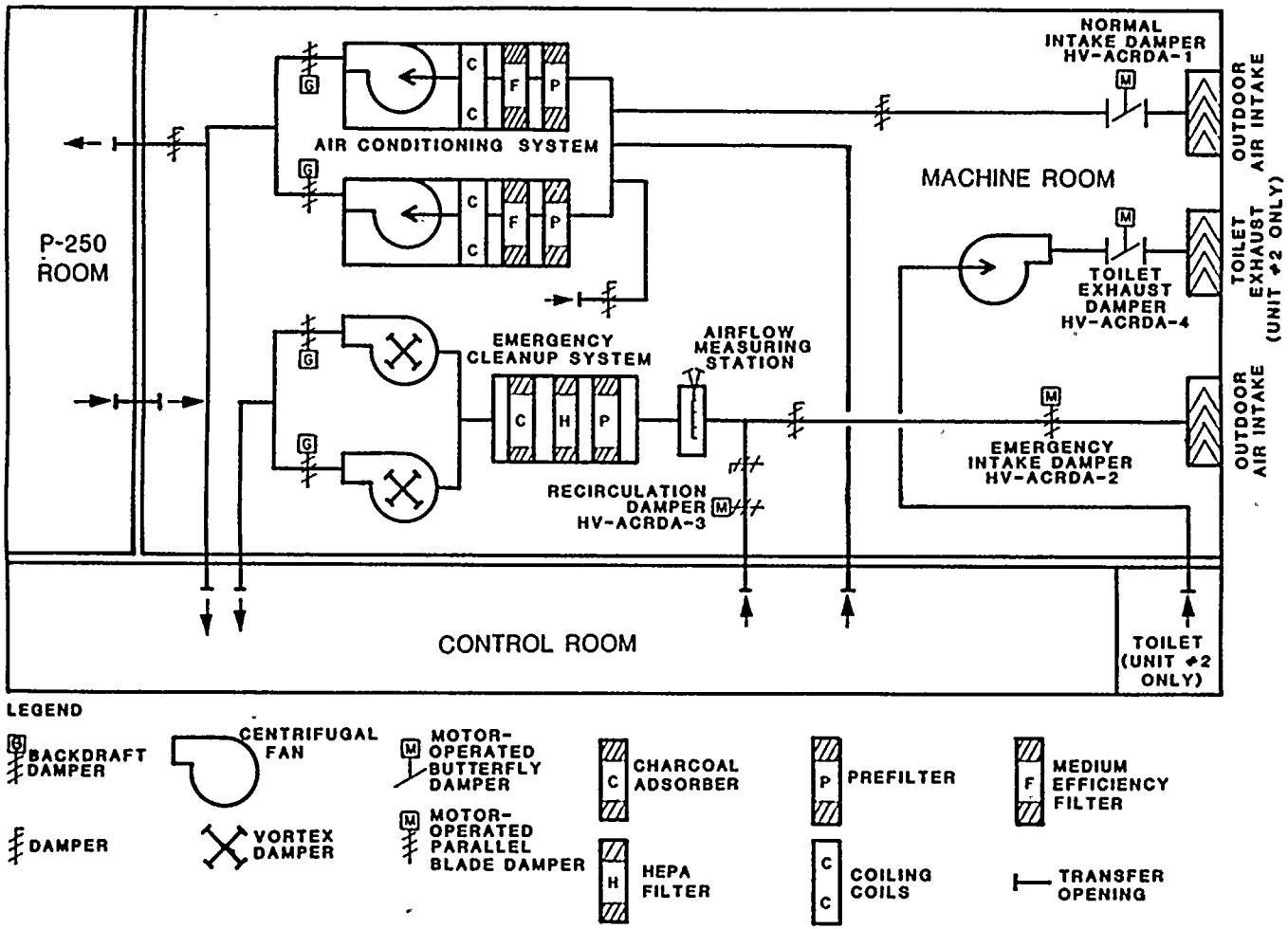


Table 1: Control Room Ventilation Equipment Operation

Normal Operation:

Equipment	Condition
Damper ACRDA-1	Open
Damper ACRDA-2	Open to recirculation/cleanup setting
Damper ACRDA-3	Closed
Damper ACRDA-4	Closed or open
Pressurization Fans	Not running

Toxic Gas (Isolation):

Equipment	Condition
Damper ACRDA-1	Closed
Damper ACRDA-2	Open to recirculation/cleaup setting
Damper ACRDA-3	Closed
Damper ACRDA-4	Closed
Pressurization Fans	Not running

Radiological (Recirculation/Cleanup)

Equipment	Condition
Damper ACRDA-1	Closed
Damper ACRDA-2	Open to recirculation/cleanup setting
Damper ACRDA-3	Open
Damper ACRDA-4	Closed
Recirculation Fans	1 running

FIGURE 2: **CONTROL ROOM BETA SKIN AND GAMMA BODY DOSE**

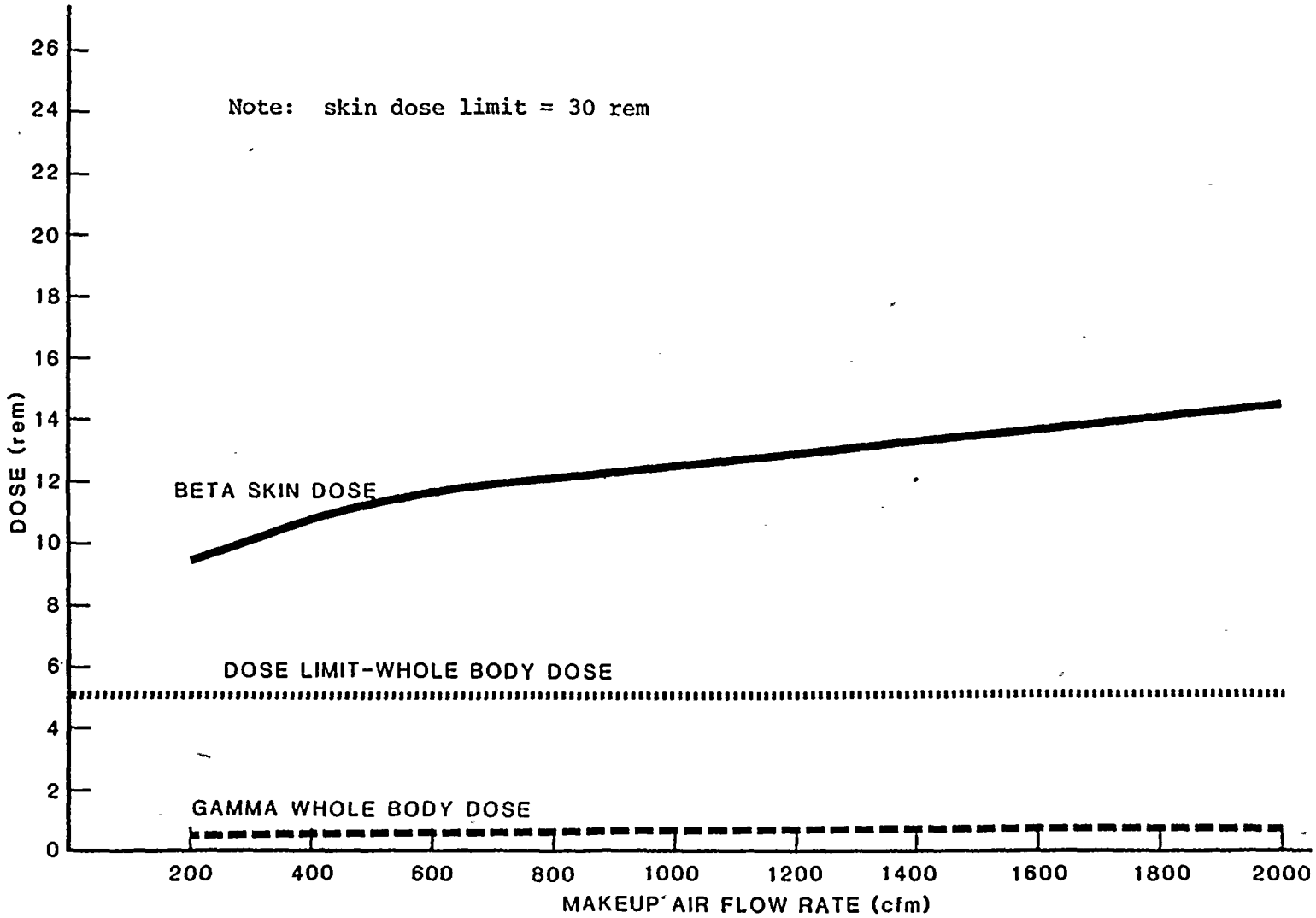
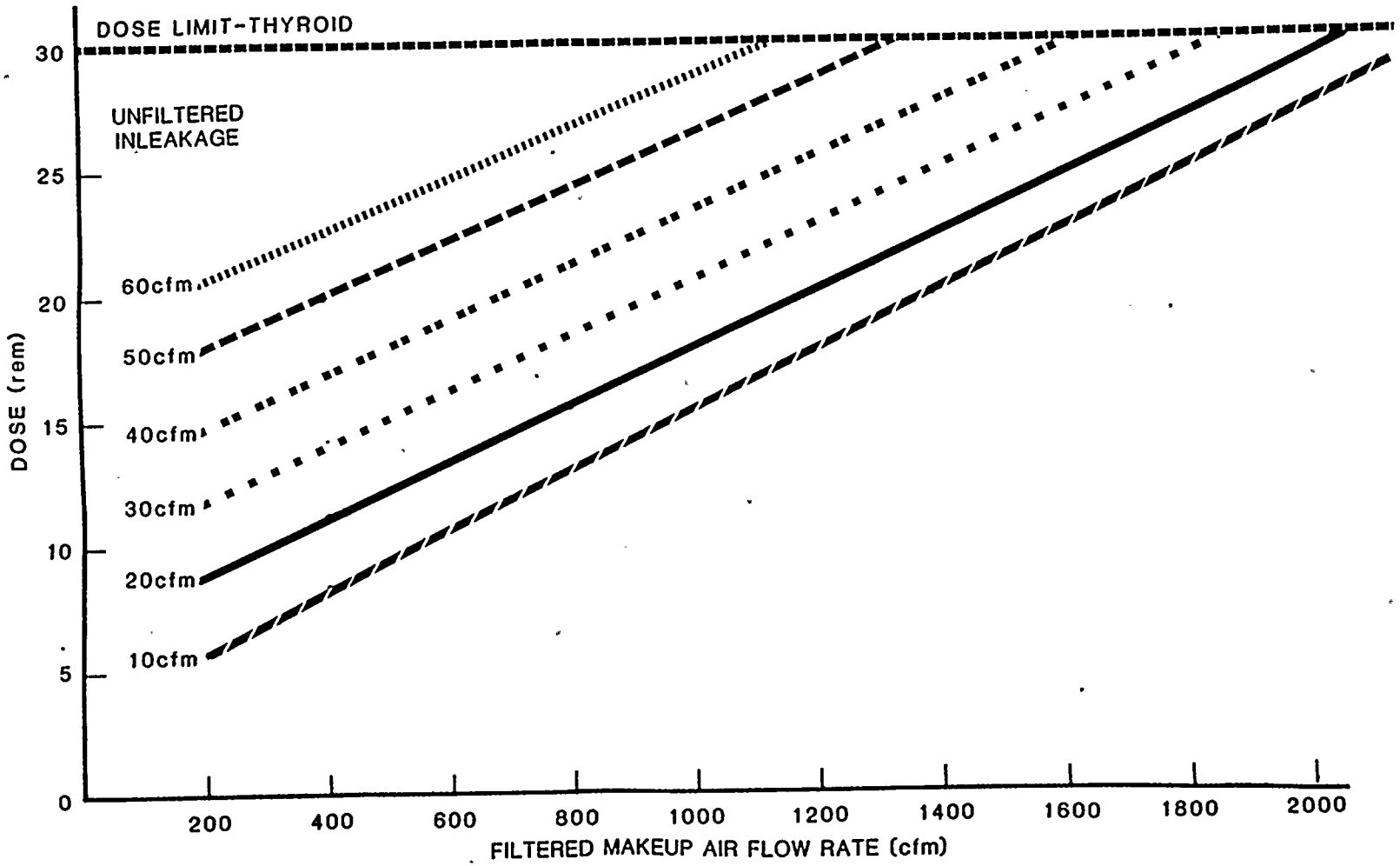


FIGURE 3: **CONTROL ROOM THYROID DOSE**



3/4.7.6 ESF VENTILATION SYSTEM

The OPERABILITY of the ESF ventilation system ensures that radioactive materials leaking from the ECCS equipment within the pump room following a LOCA are filtered prior to reaching the environment. The operation of this system and the resultant effect on offsite dosage calculation was assumed in the accident analyses.

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, is 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.

INSTRUMENTATION

CHLORINE DETECTION SYSTEM

LIMITING CONDITION FOR OPERATION

3.3.3.11 The chlorine detection system, with its alarm setpoint adjusted to actuate at a chlorine concentration of less than or equal to 5 ppm, shall be OPERABLE.

APPLICABILITY: All MODES.

ACTION:

a. With the chlorine detection system of either unit inoperable, within 1 hour initiate and maintain operation of both the Unit 1 and Unit 2 control room emergency ventilation systems in the isolation mode of operation, as defined in the Bases.

b. The provisions of Specifications 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.3.3.11 The chlorine detection system shall be demonstrated OPERABLE by performance of a CHANNEL FUNCTIONAL TEST at least once per 31 days and a CHANNEL CALIBRATION at least once per 18 months.

PLANT SYSTEMS

3/4.7.5 CONTROL ROOM EMERGENCY VENTILATION SYSTEM

LIMITING CONDITION FOR OPERATION

3.7.5.1 The control room emergency ventilation system shall be OPERABLE with:

a. Two independent heating and cooling systems,

b. Two independent pressurization fans,

c. One charcoal adsorber and HEPA filter train, and

d. The control room pressure boundary.

APPLICABILITY: All MODES.

ACTION: MODES 1, 2, 3, and 4:

a. With one heating and cooling system inoperable, restore the inoperable system 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.

b. With one pressurization fan inoperable, restore the inoperable fan 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.

c. With the filter train inoperable, restore the filter train to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

d. With the control room pressure boundary inoperable, restore the control room pressure boundary to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

MODES 5 and 6:

e. With any of the following: (1) both heating and cooling systems; (2) both pressurization fans; (3) the filter train; (4) the control room pressure boundary; inoperable, suspend all operations involving CORE ALTERATIONS or positive reactivity changes.

SURVEILLANCE REQUIREMENTS

4.7.5.1 The control room emergency ventilation system shall be demonstrated OPERABLE:

a. At least once per 12 hours by verifying that the control room air temperature is $\leq 120^{\circ}F$.

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

c. 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. 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 6000 cfm $\pm$ 10%.

2. 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 6000 cfm $\pm$ 10%.

3. 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 $\geq$ 95% for radioactive methyl iodide when the sample is tested in accordance with ANSI N510-1980 ($130^{\circ}C$, 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 6000 cfm $\pm$ 10%.

4. Verifying a system flow rate of 6000 cfm $\pm$ 10% during system operation in the recirculation/cleanup mode, when tested in accordance with ANSI N510-1980.

d. 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 $\geq$ 95% 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 a laboratory analysis of at least two carbon samples demonstrates a removal efficiency of $\geq$ 95% 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 $\geq$ 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 6000 cfm $\pm$ 10%.

e. 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 (W.G.) while operating the ventilation system at a flow rate of 6000 cfm ± 10%.

2. a) Verifying that on a Safety Injection Signal from Unit 1, the system automatically initiates operation in the recirculation/cleanup mode.

   b) Verifying that on a Safety Injection Signal from Unit 2, the system automatically initiates operation in the recirculation/cleanup mode.

3. Verifying that the system maintains the control room at a positive pressure of ≥ 1/16 inch W.G. relative to the outside atmosphere at a system flow rate of 6000 cfm ± 10% while operating in the recirculation/cleanup mode.

4. Verifying that the system maintains the machine room and the P250 computer room at a positive pressure with respect to the outside atmosphere, in conjunction with testing required by Specification 4.7.5.1.e.3.

5. Verifying that the combination of filtered makeup and unfiltered inleakage is within limits, as defined in the Bases, which will maintain the control room habitable under radiological accident conditions, in conjunction with testing required by Specification 4.7.5.1.e.3.

f. 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 6000 cfm ± 10%.

g. 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 6000 cfm ± 10%.

3/4.3.3.8 FIRE DETECTION INSTRUMENTATION

OPERABILITY of the fire detection instrumentation ensures that adequate warning capability is available for the prompt detection of fires. This capability is required in order to detect and locate fires in their early stages. Prompt detection of fires will reduce the potential for damage to safety-related equipment and is an integral element in the overall facility fire protection program.

In the event that a portion of the fire detection instrumentation is inoperable, the establishment of frequent fire patrols in the affected areas is required to provide detection capability until the inoperable instrumentation is restored to OPERABILITY. Use of containment temperature monitoring is allowed once per hour if containment fire detection is inoperable.

3/4.3.3.9 RADIOACTIVE LIQUID EFFLUENT INSTRUMENTATION

The radioactive liquid effluent instrumentation is provided to monitor and control, as applicable, the releases of radioactive materials in liquid effluent during actual or potential releases. The alarm/trip setpoints for these instruments shall be calculated in accordance with NRC approved methods in the ODCM to ensure that the alarm/trip will occur prior to exceeding the limits of 10 CFR Part 20. The OPERABILITY and use of this instrumentation is consistent with the requirements of General Design Criteria specified in Section 11.3 of the Final Safety Analysis Report for the Donald C. Cook Nuclear Plant.

3/4.3.3.10 RADIOACTIVE GASEOUS EFFLUENT INSTRUMENTATION

The radioactive gaseous effluent instrumentation is provided to monitor and control, as applicable, the releases of radioactive materials in gaseous effluents during actual or potential releases. The alarm/trip setpoints for these instruments shall be calculated in accordance with NRC approved methods in the ODCM to ensure that the alarm/trip will occur prior to exceeding the limits of 10 CFR Part 20. This instrumentation also includes provisions for monitoring the concentrations of potentially explosive gas mixtures in the waste gas holdup system. The OPERABILITY and use of this instrumentation is consistent with the requirements of General Design Criteria specified in Section 11.3 of the Final Safety Analysis Report for the Donald C. Cook Nuclear Plant.

3/4.3.3.11 CHLORINE DETECTION SYSTEM

The OPERABILITY of the detection system ensures that sufficient capability is available to promptly detect and initiate protective action in the event of an accidental chlorine release. In the event chlorine is detected, the control

room ventilation system would be manually placed in the isolation mode of operation. This is accomplished by closing isolation dampers on the normal air intake and the toilet room exhaust. The pressurization fans are not run, to minimize the amount of contaminated outdoor air which enters the control room. The emergency air intake damper cannot be closed from the control room beyond the setting for the recirculation/cleanup mode. Thus, the recirculation damper is maintained closed so that contaminated air entering via the emergency intake passes through the charcoal adsorbers prior to entering the control room.

3/4.3.4 TURBINE OVERSPEED PROTECTION

This specification is provided to ensure that the turbine overspeed protection instrumentation and the turbine speed control valves are OPERABLE and will protect the turbine from excessive overspeed. Protection from turbine excessive overspeed is required since excessive overspeed of the turbine could generate potentially damaging missiles which could impact and damage safety related components, equipment or structures.

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 control room ventilation systems, 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, unless future air-aerosol mixing tests justify the adequacy of filter leak testing methods.

In the event chlorine gas is detected, or if the chlorine detector of either unit is inoperable, the control room ventilation system is placed in the isolation mode of operation. This is accomplished by closing isolation dampers on the normal air intake and the toilet room exhaust. The pressurization fans are not run, to minimize the amount of contaminated outdoor air which enters the control room. The emergency air intake damper cannot be closed from the control room beyond the setting for the recirculation/cleanup mode. Thus, the recirculation damper is maintained closed so that contaminated air entering via the emergency intake passes through the charcoal adsorbers prior to entering the control room.

In the event of a radiological accident, such as a LOCA, the control room ventilation system would be aligned automatically in the recirculation/cleanup mode of operation. This occurs automatically in both units in the event of a safety injection signal from either unit. Upon system actuation the normal air intake and toilet room exhaust are automatically closed via isolation dampers. Both of the redundant pressurization fans start, drawing outdoor makeup air for pressurization purposes through the emergency intake damper. This damper is preset to a position sufficient to allow the required pressurization while limiting outdoor air intake to an amount which will ensure control room habitability, as described below. The operators are instructed to shut off one of the redundant fans after assuring they both started. This is to assure that iodine residence time requirements are met, so as to provide filter efficiencies consistent with those assumed in the accident analyses.

In the recirculation/cleanup mode, the ventilation system is sized to provide pressurization of $\geq$ 1/16 inches W.G. relative to the outside atmosphere. The machine room and P250 computer room are intended to be at pressures which are positive with respect to the outside atmosphere, but which may be less positive than the control room. The lower pressure requirement is because these rooms would not be expected to be entered or exited as often as the control room during an accident. Pressure in the P250 computer room would always be slightly higher than the machine room because of the small pressure drop associated with air passage through the transfer openings. Therefore, a positive pressure measurement in the machine room will ensure a positive pressure in the computer room.

Figure 1, and its accompanying Table 1, provide a graphic representation of the control room ventilation system under normal, radiological, and toxic gas conditions.

Technical Specifications require verification that the combination of filtered and unfiltered inleakage is within limits which will maintain the control room habitable under radiological accident conditions. Acceptable combinations of inleakage are those that limit doses to control room personnel to 5 rem whole-body, 30 rem thyroid, or 30 rem to the skin under an assumed accident duration of 30 days. These combinations are derived from Figures 1 and 2. Dose lines of these figures may be extrapolated linearly to accommodate larger values of filtered or unfiltered inleakage. In these figures, filtered air inleakage is taken to be that air which is brought in through the filter unit to provide makeup for pressurization purposes. Unfiltered makeup air is defined as the sum of air which is measured to leak past the normal air intake isolation damper, when it is in the closed position, and a nominal 10 cfm which accounts for opening and closing of the control room doors during the course of an accident.

To use the whole-body and skin dose curves, the total makeup air flow rate is obtained by summing the filtered and unfiltered values obtained as described above, and verifying that the 30-day dose resulting from this total is below the limits shown. For the thyroid dose, a point on Figure 3 is found which corresponds to the appropriate filtered and unfiltered in-leakage combination. The 30-day dose associated with this point must be below the 30 rem thyroid dose limit.

FIGURE 1: CONTROL ROOM VENTILATION SYSTEM

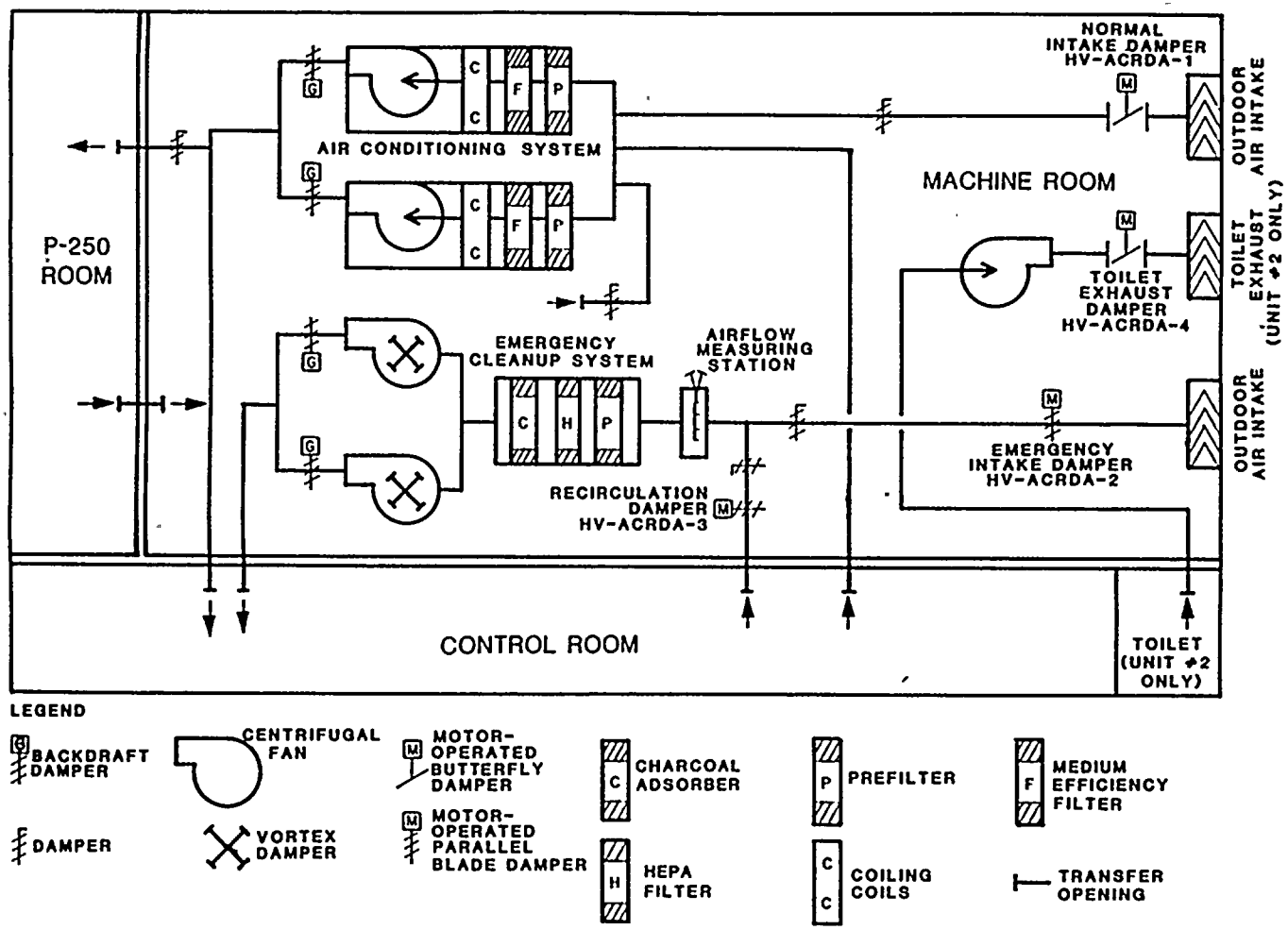


Table 1: Control Room Ventilation Equipment Operation

Normal Operation:

Equipment	Condition
Damper ACRDA-1	Open
Damper ACRDA-2	Open to recirculation/cleanup setting
Damper ACRDA-3	Closed
Damper ACRDA-4	Closed or open
Pressurization Fans	Not running

Toxic Gas (Isolation):

Equipment	Condition
Damper ACRDA-1	Closed
Damper ACRDA-2	Open to recirculation/cleaup setting
Damper ACRDA-3	Closed
Damper ACRDA-4	Closed
Pressurization Fans	Not running

Radiological (Recirculation/Cleanup)

Equipment	Condition
Damper ACRDA-1	Closed
Damper ACRDA-2	Open to recirculation/cleanup setting
Damper ACRDA-3	Open
Damper ACRDA-4	Closed
Recirculation Fans	1 running

FIGURE 2: **CONTROL ROOM BETA SKIN AND GAMMA BODY DOSE**

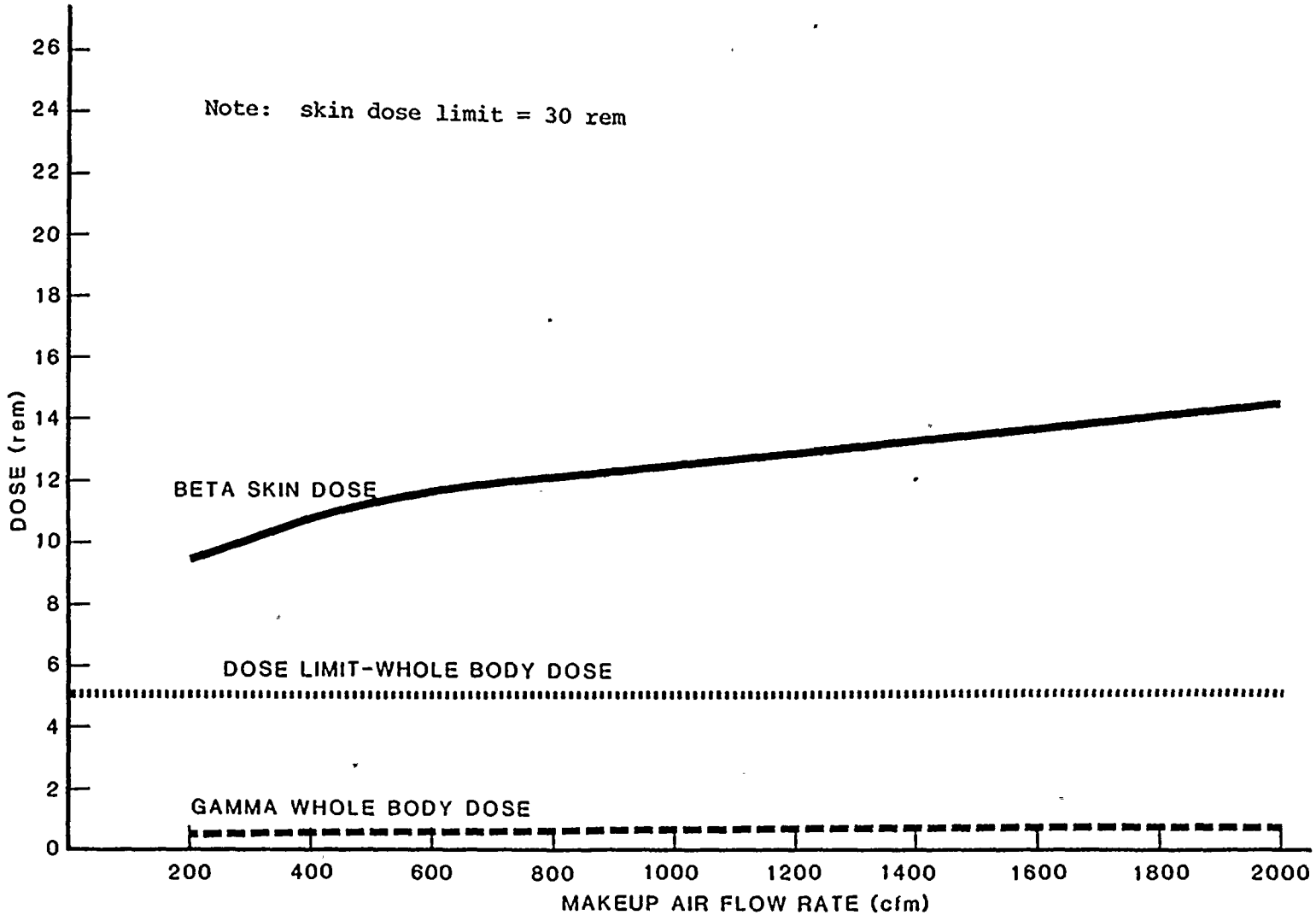
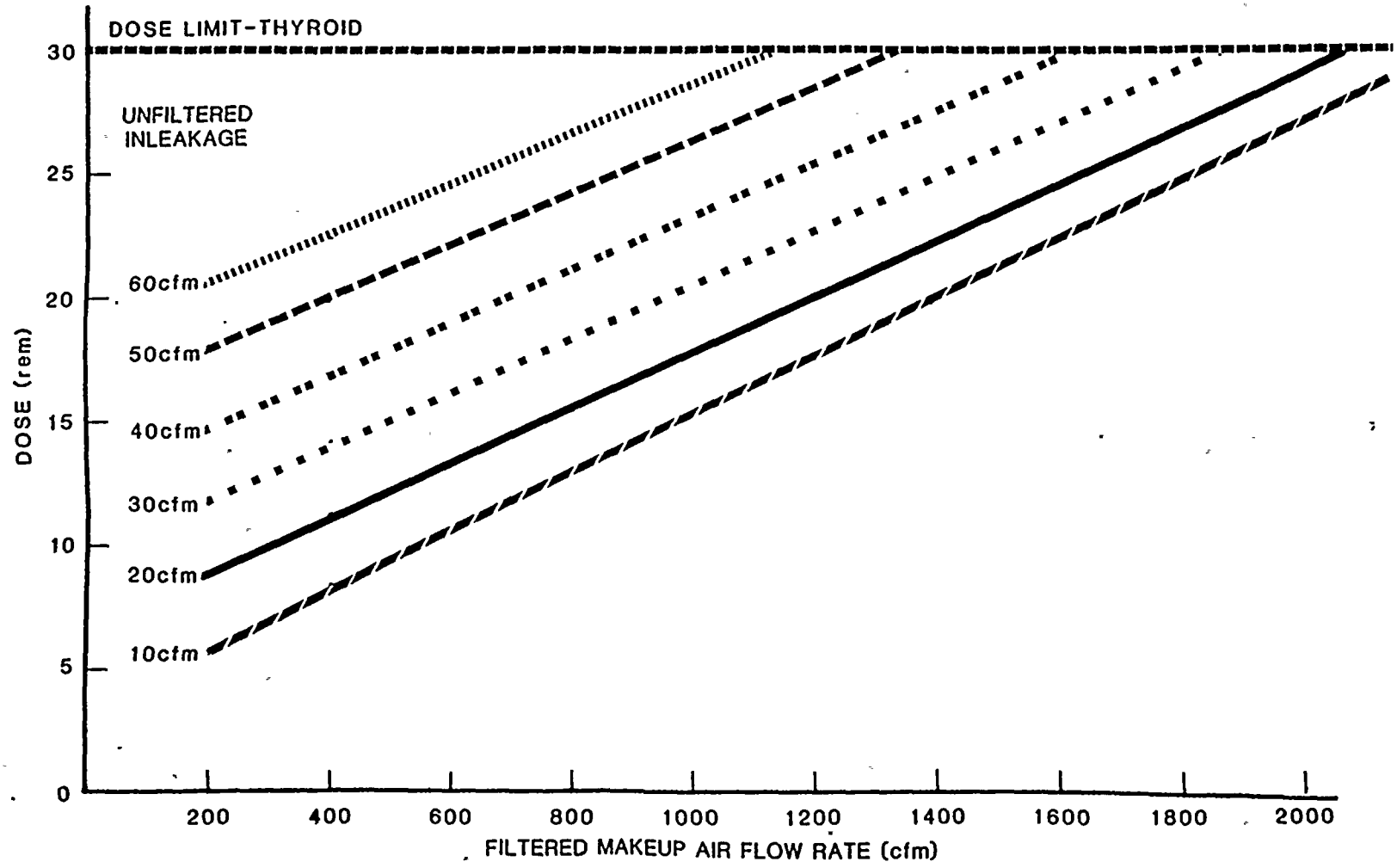


FIGURE 3: **CONTROL ROOM THYROID DOSE**



ATTACHMENT 3 TO AEP:NRC:08560

WESTINGHOUSE ELECTRIC CORPORATION CONTROL ROOM

HABITABILITY ANALYSIS

ATTACHMENT 3 TO AEP:NRC:08560

WESTINGHOUSE ELECTRIC CORPORATION CONTROL ROOM HABITABILITY ANALYSIS

Westinghouse Electric Corporation
Water Reactor Divisions

Box 355
Pittsburgh Pennsylvania 15230-0355

AEP-85-629

May 16, 1985

NS-OPLS-OPL-85-235

Ref 1: Telecon 3/18/85
J. Feinstein (AEP)
K. Rubin (W),
L. Tomasic (W)

Ref 2: LER Submittal 85-007
3/25/85

Mr. M. P. Alexich, Vice President &
Director, Nuclear Operations
American Electric Power Service Corporation
One Riverside Plaza
Columbus, Ohio 43216

AMERICAN ELECTRIC POWER SERVICE CORPORATION
D. C. COOK UNITS 1 AND 2
CONTROL ROOM DOSE EVALUATION

Dear Mr. Alexich:

In response to the referenced request from American Electric Power Service Corporation (Ref. 1), Westinghouse has reviewed the AEP control room dose calculations, documented in Ref. 2, and we find the methodology and the resulting doses to be conservative. This conclusion is based upon a comparison of the methodology and results of the AEP dose calculations to the methodology and results of analyses performed by Westinghouse.

Parametric values for the major calculational parameters used by Westinghouse are provided in Table 1. Dose conversion factors are provided in Table 2. The resulting doses are summarized in Table 3 and presented graphically in Figures 1 and 2.

All of the calculated doses are within the guidelines of GDC-19 and SRP 6.4. Hence, no protective clothing or eye protection will be required.

Very truly yours,

A. P. Suda

A. P. Suda, Manager
Great Lakes Area
Projects Department

KB/anj

cc: M. P. Alexich, 1L/1A
W. G. Smith, 1L/1A
J. G. Feinstein, 1L/1A
V. Vanderburg, 1L/1A
R. W. Jurgensen, 1L/1A
R. Shoemaker, 1L/1A
B. Svensson, 1L/1A

TABLE 1

PARAMETERS USED IN EVALUATING THE CONTROL ROOM DOSES DUE TO A LOCA FOR THE D. C. COOK NUCLEAR PLANT

General

Core power level, MWt	3391
Full-power operation, effective full-power days (EFPD) (Based on a three-region equilibrium cycle core at end of life)	900

Source Term

The core iodine and noble gas inventories are based upon a standard Westinghouse 3565 MWt core and have been adjusted downward to reflect a power level of 3391 MWt.

Fifty percent of the core iodine is assumed to be uniformly distributed in the lower containment at time zero (TID-14844/Regulatory Guide 1.4).

I-131	4.7×10^7 curies
I-132	6.9×10^7
I-133	9.5×10^7
I-134	1.1×10^8
I-135	8.9×10^7

Iodine Plate-out Factor	0.5

Iodine species

Elemental	0.91
Organic	0.04
Particulate	0.05

100 percent of the core noble gas is released to containment.

Kr-85m	2.6×10^7 curies
Kr-85	6.3×10^5
Kr-87	4.7×10^7
Kr-88	6.7×10^7

TABLE 1
(2 of 4)

PARAMETERS USED IN EVALUATING THE CONTROL ROOM DOSES DUE TO A LOCA FOR THE D. C. COOK NUCLEAR PLANT

Xe-131m	6.7×10^5
Xe-133m	2.8×10^7
Xe-133	1.8×10^8
Xe-135m	3.8×10^7
Xe-135	4.0×10^7
Xe-138	1.5×10^8

Activity Release Parameters	
Free volume of containment, ft^3	1.23×10^6
Volume of upper containment, ft^3	7.47×10^5
Volume of lower containment, ft^3	3.65×10^5
Volume of ice beds	1.22×10^5
Containment leak rate	
0-24 hr, percent/day	0.25
>24 hr.	0.125
Control, HVAC and Computer Rooms	
Free volume, ft^3	62,356
Unfiltered infiltration rate, ft^3/min	10 to 60
Filtered intake rate, ft^3/min	200 to 800
Internal recirculation rate, ft^3/min	5400
Iodine removal efficiency for charcoal adsorber (elemental and methyl), percent	95
HEPA filter efficiency for particulates, percent	99

TABLE 1
(3 of 4)

PARAMETERS USED IN EVALUATING THE CONTROL ROOM DOSES
DUE TO A LOCA FOR THE D. C. COOK NUCLEAR PLANT

Containment Spray Parameters

Sprayed volume (upper containment), ft^3	7.47×10^5
Spray fall height, ft	~50
Elemental iodine spray, lambda, hr^{-1}	10
Elemental iodine DF (includes the combined effects of sprays and the ice condenser)	200
Particulate iodine spray lambda, hr^{-1}	4.8
Particulate iodine DF	~100

Ice Condenser Parameters

Elemental iodine removal efficiency

0-10 min.	0
10-20 min.	0.3
>20 min.	0

Flow rates, cfm

0-10 min. (average)	416,000 (from lower to upper containment)
>10 min.	41,800 (recirculated between lower and upper containment)

Miscellaneous Parameters

Atmospheric dispersion factors at the control room air intake, sec/m^3

The 0-24 hour x/Q of 8.26×10^{-4} is adjusted for wind speed, wind direction and occupancy according to the following table:

	Wind Speed	Direction	Occupancy	Overall Factor
0-8 hr.	1	1	1	1
8-24 hr.	.67	.88	1	.59
1-4 days	.5	.75	.6	.23
4-30 days	.33	.5	.4	.066

TABLE 1
(4 of 4)

PARAMETERS USED IN EVALUATING THE CONTROL ROOM DOSES
DUE TO A LOCA FOR THE D. C. COOK NUCLEAR PLANT

The overall x/Q factors are as follows:

0- 8 hr	8.26×10^{-4} sec/m^3
8- 24	4.87×10^{-4}
24- 96	1.9×10^{-4}
96-720	5.45×10^{-5}
Breathing rate, m^3/sec	3.47×10^{-4}
Dose conversion factors	See Table 2
Finite cloud gamma dose reduction factor*	28

*K. G. Murphy, K. M. Campe, "Nuclear Power Plant Control Room Ventilation System Design for Meeting GDC 19," 13th AEC Air Cleaning Conference.

TABLE 2

DOSE CONVERSION FACTORS USED IN ACCIDENT ANALYSIS*

Nuclide	Total Body $\frac{\text{rem-m}^3}{\text{Ci-s}}$	Beta Skin $\frac{\text{rem-m}^3}{\text{Ci-s}}$	Thyroid (rem/Ci)
I-131	NA	NA	1.49E+6
I-132	NA	NA	1.43E+4
I-133	NA	NA	2.69E+5
I-134	NA	NA	3.73E+3
I-135	NA	NA	5.60E+4
Kr-85m	3.71E-2	4.63E-2	NA
Kr-85	5.11E-4	4.25E-2	NA
Kr-87	1.88E-1	3.09E-1	NA
Kr-88	4.67E-1	7.52E-2	NA
Xe-131m	2.91E-3	1.51E-2	NA
Xe-133m	7.97E-3	3.15E-2	NA
Xe-133	9.33E-3	9.70E-3	NA
Xe-135m	9.91E-2	2.25E-2	NA
Xe-135	5.75E-2	5.90E-2	NA
Xe-138	2.80E-1	1.31E-1	NA

*"Calculation of Annual Doses to Man from Routine Releases of Reactor Effluents for the Purpose of Evaluating Compliance with 10 CFR Part 20 Appendix I," USNRC Regulatory Guide 1.109, Rev. 1, October 1977.

TABLE 3

30-DAY DOSES TO CONTROL ROOM PERSONNEL
DUE TO A DESIGN BASIS LOCA

Thyroid Doses - Rem*

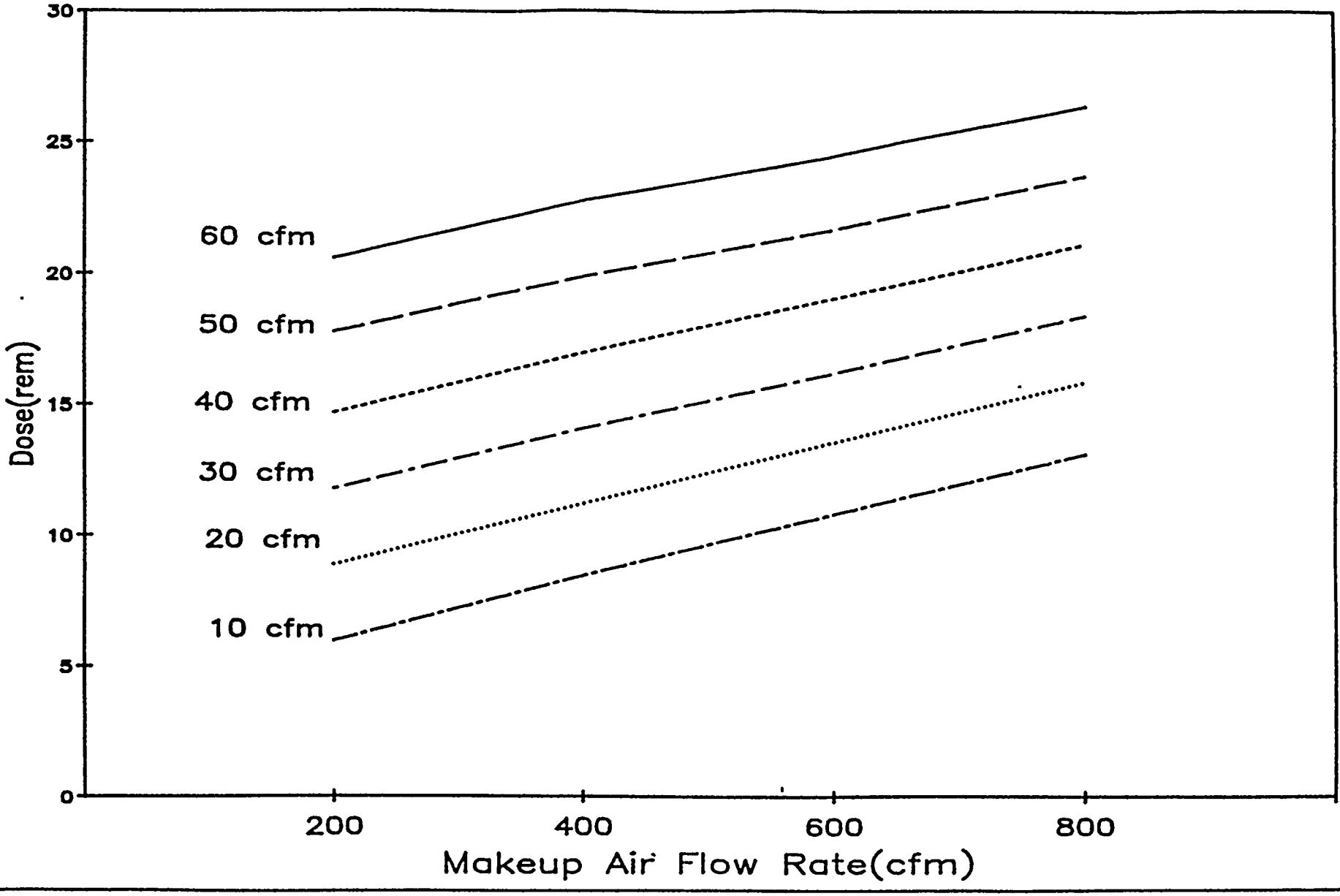
Unfiltered Inleakage - CFM	Filtered Makeup - CFM		
	200	400	800
10	5.9	8.5	13.1
20	8.9	11.3	15.8
30	11.8	14.2	18.4
40	14.7	17.0	21.1
50	17.8	19.9	23.8
60	20.6	22.7	26.4

Beta Skin and Gamma Body Doses - Rem

Makeup Air Flow Rate - CFM	β Skin*	γ Body	γ Body Adjusted for Finite Cloud**
200	9.5	11.7	.42
300	10.4	13.4	.48
400	10.9	14.5	.52
500	11.3	15.3	.55
600	11.7	16.0	.57
700	11.9	16.5	.59
800	12.1	16.9	.60

*Dose Guideline = 30 Rem
**Dose Guideline = 5 Rem

FIGURE 1
Control Room Thyroid Dose



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