ATTACHMENT B

PROPOSED CHANGES TO THE TECHNICAL SPECIFICATIONS

FOR OPERATING LICENSE NPF-11 AND NPF-18

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LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS

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3/4.7 PLANT SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

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 subsystem by:

GUIDANCE IN

1. Verifying that the subsystem satisfies the in-place testing acceptance criteria and uses the test procedures of Regulatory Positions C.5.a, C.5.c and C.5.d of Regulatory Guide 1.52, Revision 2, March 1978, and the system flow rate is 4000 cfm ± 10%.

of Less than 0.05% penetration

2. Verifying within 31 days after removal that a laboratory analysis of a representative carbon sample obtained in accordance with Regulatory Position C.6.b of Regulatory Guide 1.52, Revision 2, March 1978, meets the laboratory testing criteria of Regulatory Position C.6.a of Regulatory Guide 1.52, Revision 2, March 1978.

3. Verifying a subsystem flow rate of 4000 cfm ± 10% during system operation when tested in accordance with ANSI N510-1975.

INSERT A

c. After every 720 hours of charcoal adsorber operation by verifying within 31 days after removal that a laboratory analysis of a representative carbon sample obtained in accordance with Regulatory Position C.6.b of Regulatory Guide 1.52, Revision 2, March 1978, meets the laboratory testing criteria of Regulatory Position C.6.a of Regulatory Guide 1.52, Revision 2, March 1978.

d. At least once per 18 months by:

1. Verifying that the pressure drop across the combined HEPA filters and charcoal adsorber banks is less than or equal to 8 inches Water Gauge while operating the filter train at a flow rate of 4000 cfm ± 10%.

2. Verifying that the filter train starts and isolation dampers open on each of the following test signals:

   a. Reactor Building exhaust plenum radiation - high,

   b. Drywell pressure - high,

   c. Reactor vessel water level - low low, level 2, and

   d. Fuel pool vent exhaust radiation - high.

3. Verifying that the heaters dissipate 23 ± 2.0 kw when tested in accordance with ANSI N510-1975. This reading shall include the appropriate correction for variations from 480 volts at the bus.

SURVEILLANCE REQUIREMENTS (Continued)

e. After each complete or partial replacement of a HEPA filter bank by verifying that the HEPA filter banks remove greater than or equal to 99% of the DOP when they are tested in-place in accordance with ANSI N510-1975 while operating the system at a flow rate of 4000 cfm ± 10%.

f. After each complete or partial replacement of a charcoal adsorber bank by verifying that the charcoal adsorbers remove greater than or equal to 99% of a halogenated hydrocarbon refrigerant test gas when they are tested in-place in accordance with ANSI N510-1975 while operating the system at a flow rate of 4000 cfm ± 10%.

REPLACE WITH INSERT B

3/4.7.2 CONTROL ROOM AND AUXILIARY ELECTRIC EQUIPMENT ROOM EMERGENCY FILTRATION SYSTEM

LIMITING CONDITION FOR OPERATION

3.7.2 Two independent control room and auxiliary electric equipment room emergency filtration system trains shall be OPERABLE.#

APPLICABILITY: All OPERATIONAL CONDITIONS and *.

ACTION:

a. With one emergency filtration system train inoperable, restore the inoperable train to OPERABLE status within 7 days or:

1. In OPERATIONAL CONDITIONS 1, 2, 3, be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

2. In OPERATIONAL CONDITION 4, 5 or *, initiate and maintain operation of the OPERABLE emergency filtration system in the pressurization mode of operation.

b. With both emergency filtration system trains inoperable, in OPERATIONAL CONDITION 4, 5 or *, suspend CORE ALTERATIONS, handling of irradiated fuel in the secondary containment and operations with a potential for draining the reactor vessel.

c. The provisions of Specification 3.0.3 are not applicable in Operational Condition *.

SURVEILLANCE REQUIREMENTS

4.7.2 Each control room and auxiliary electric equipment room emergency filtration system 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 filters and charcoal adsorbers and verifying that the train operates for at least 10 hours with the heaters OPERABLE.

*When irradiated fuel is being handled in the secondary containment.

#The normal or emergency power source may be inoperable in OPERATIONAL CONDITION 4, 5 or *.

SURVEILLANCE REQUIREMENTS (Continued)

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 train by:

1. Verifying that the train satisfies the in-place testing acceptance criteria [OF LESS THAN 1.0% PENETRATION] and uses the test procedures [guidance in] of Regulatory Positions C.5.a, C.5.c and C.5.d of Regulatory Guide 1.52, Revision 2, March 1978, and the train flow rate is 4000 cfm ± 10%.

2. Verifying within 31 days after removal that a laboratory analysis of a representative carbon sample obtained in accordance with Regulatory Position C.6.b of Regulatory Guide 1.52, Revision 2, March 1978, meets the laboratory testing criteria of Regulatory Position C.6.a of Regulatory Guide 1.52, Revision 2, March 1978. [INSERT C]

3. Verifying a train flow rate of 4000 cfm ± 10% during subsystem operation when tested in accordance with ANSI N510-1975.

c. After every 720** hours of charcoal adsorber operation by verifying within 31 days after removal that a laboratory analysis of a representative carbon sample obtained in accordance with Regulatory Positon C.6.b of Regulatory Guide 1.52, Revision 2, March 1978, meets the laboratory testing criteria of Regulatory Position C.6.a of Regulatory Guide 1.52, Revision 2, March 1978. [INSERT C]

d. At least once per 18 months by:

1. Verifying that the pressure drop across the combined HEPA filters and charcoal adsorber banks is less than 8 inches Water Gauge while operating the train at a flow rate of 4000 cfm ± 10%.

##This surveillance shall include the recirculating charcoal filter, "odor eater," in the normal control room supply filter train using ANSI N510-1975 as a guide to verify ≥ 70% efficiency in removing freon test gas.

**Except that recirculating charcoal filter samples shall be removed and analyzed at least once per 18 months.

2. Verifying that on each of the below pressurization mode actuation test signals, the emergency train automatically switches to the pressurization mode of operation and the control room is maintained at a positive pressure of 1/8 inch W.G. relative to the adjacent areas during emergency train operation at a flow rate less than or equal to 4000 cfm:

   a) Outside air smoke detection, and

   b) Air intake radiation monitors.

3. Verifying that the heaters dissipate 20 ± 2.0 Kw when tested in accordance with ANSI N510-1975. This reading shall include the appropriate correction for variations from 480 volts at the bus.

e. After each complete or partial replacement of a HEPA filter bank by verifying that the HEPA filter banks remove greater than or equal to 99% of the DOP when they are tested in-place in accordance with ANSI N510-1975 while operating the system at a flow rate of 4000 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 N510-1975 while operating the system at a flow rate of 4000 cfm ± 10%.

REPLACE WITH INSERT D

This surveillance shall include the recirculating charcoal filter, "odor eater," in the normal control room supply filter train using ANSI N510-1975 as a guide to verify ≥ 70% efficiency in removing freon test gas.

3/4.7 PLANT SYSTEMS

BASES

3/4.7.1 CORE STANDBY COOLING SYSTEM - EQUIPMENT COOLING WATER SYSTEMS

The OPERABILITY of the core standby cooling system - equipment cooling water systems and the ultimate heat sink ensure that sufficient cooling capacity is available for continued operation of safety-related equipment during normal and accident conditions. The redundant cooling capacity of these systems, assuming a single failure, is consistent with the assumptions used in the accident conditions within acceptable limits.

3/4.7.2 CONTROL ROOM AND AUXILIARY ELECTRIC EQUIPMENT ROOM EMERGENCY FILTRATION SYSTEM

The OPERABILITY of the control room and auxiliary electric equipment room emergency filtration system ensures that the rooms will remain habitable for operations personnel during and following all design basis accident conditions. The OPERABILITY of this system in conjunction with room design provisions is based on limiting the radiation exposure to personnel occupying the rooms 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 Part 50. Cumulative operation of the system with the heaters OPERABLE for 10 hours over a 31 day period is sufficient to reduce the buildup of moisture on the adsorbers and HEPA filters.

3/4.7.3 REACTOR CORE ISOLATION COOLING SYSTEM

The reactor core isolation cooling (RCIC) system is provided to assure adequate core cooling in the event of reactor isolation from its primary heat sink and the loss of feedwater flow to the reactor vessel without requiring actuation of any of the Emergency Core Cooling System equipment. The RCIC system is conservatively required to be OPERABLE whenever reactor pressure exceeds 150 psig even though the LPCI mode of the the residual heat removal (RHR) system provides adequate core cooling up to 350 psig.

The RCIC system specifications are applicable during OPERATIONAL CONDITIONS 1, 2 and 3 when reactor vessel pressure exceeds 150 psig because RCIC is the primary non-ECCS source of core cooling when the reactor is pressurized.

With the RCIC system inoperable, adequate core cooling is assured by the OPERABILITY of the HPCS system and justifies the specified 14 day out-of-service period.

The surveillance requirements provide adequate assurance that RCICS will be OPERABLE when required. Although all active components are testable and full flow can be demonstrated by recirculation during reactor operation, a complete functional test requires reactor shutdown. Initial startup test program data may be used to determine equivalent turbine/pump capabilities between test flow path and the vessel injection flow path. The pump discharge piping is maintained full to prevent water hammer damage and to start cooling at the earliest possible moment.

INSERT A

ASTM D 3803-79, for a methyl iodide penetration of less than 0.5% when tested at a temperature of 30°C and a relative humidity of 70%.

INSERT B

e. After each complete or partial replacement of a HEPA filter bank by verifying that the HEPA filter banks have a DOP penetration of less than 0.05% when they are tested in-place in accordance with ANSI N510-1975 while operating the system at a flow rate of 4000 CFR ± 10%.

f. After each complete or partial replacement of a charcoal adsorption bank by verifying that the charcoal adsorption beds have a halogenated hydrocarbon refrigerant test gas penetration of less than 0.05% when they are tested in-place in accordance with ANSI N510-1975 while operating the system at a flow rate of 4000 CFR ± 10%.

INSERT C

ASTM D 3803-79, for a methyl iodide penetration of less than 10.0% when tested at a temperature of 30°C and a relative humidity of 70%.

INSERT D

e. After each complete or partial replacement of a HEPA filter bank by verifying that the HEPA filter banks have a DOP penetration of less than 1.0% when they are tested in-place in accordance with ANSI N510-1975 while operating the system at a flow rate of 4000 CFR ± 10%.

f. After each complete or partial replacement of a charcoal adsorption bank by verifying that the charcoal adsorption beds have a halogenated hydrocarbon refrigerant test gas penetration of less than 1.0% when they are tested in-place in accordance with ANSI N510-1975 while operating the system at a flow rate of 4000 CFR ± 10%.

LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS

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BASES

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3/4.7 PLANT SYSTEMS

3/4.8 ELECTRICAL POWER SYSTEMS

3/4.9 REFUELING OPERATIONS

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 subsystem by:

GUIDANCE IN

1. Verifying that the subsystem satisfies the in-place testing acceptance criteria and uses the test procedures of Regulatory Positions C.5.a, C.5.c and C.5.d of Regulatory Guide 1.52, Revision 2, March 1978, and the system flow rate is 4000 cfm ± 10%.

OF LESS than 0.05 % penetration

2. Verifying within 31 days after removal that a laboratory analysis of a representative carbon sample obtained in accordance with Regulatory Position C.6.b of Regulatory Guide 1.52, Revision 2, March 1978, meets the laboratory testing criteria of Regulatory Position C.6.a of Regulatory Guide 1.52, Revision 2, March 1978.

3. Verifying a subsystem flow rate of 4000 cfm + 10% during system operation when tested in accordance with ANSI N510-1975.

INSERT A

c. After every 720 hours of charcoal adsorber operation by verifying within 31 days after removal that a laboratory analysis of a representative carbon sample obtained in accordance with Regulatory Position C.6.b of Regulatory Guide 1.52, Revision 2, March 1978, meets the laboratory testing criteria of Regulatory Position C.6.a of Regulatory Guide 1.52, Revision 2, March 1978.

d. At least once per 18 months by:

1. Verifying that the pressure drop across the combined HEPA filters and charcoal adsorber banks is less than or equal to 8 inches water gauge while operating the filter train at a flow rate of 4000 cfm ± 10%.

2. Verifying that the filter train starts and isolation dampers open on each of the following test signals:

   a. Reactor Building exhaust plenum radiation - high,

   b. Drywell pressure - high,

   c. Reactor vessel water level - low low, level 2, and

   d. Fuel pool vent exhaust radiation - high.

3. Verifying that the heaters dissipate 23 ± 2.0 kW when tested in accordance with ANSI N510-1975. This reading shall include the appropriate correction for variations from 480 volts at the bus.

SURVEILLANCE REQUIREMENTS (Continued)

e. After each complete or partial replacement of a HEPA filter bank by verifying that the HEPA filter banks remove greater than or equal to 99% of the DOP when they are tested in-place in accordance with ANSI N510-1975 while operating the system at a flow rate of 4000 cfm ± 10%.

f. After each complete or partial replacement of a charcoal adsorber bank by verifying that the charcoal adsorbers remove greater than or equal to 99% of a halogenated hydrocarbon refrigerant test gas when they are tested in-place in accordance with ANSI N510-1975 while operating the system at a flow rate of 4000 cfm ± 10%.

REPLACE WITH INSERT B

3/4.7.2 CONTROL ROOM AND AUXILIARY ELECTRIC EQUIPMENT ROOM EMERGENCY FILTRATION SYSTEM

LIMITING CONDITION FOR OPERATION

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APPLICABILITY: All OPERATIONAL CONDITIONS and *.

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a. With one emergency filtration system train inoperable, restore the inoperable train to OPERABLE status within 7 days or:

   1. In OPERATIONAL CONDITIONS 1, 2, 3, be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

   2. In OPERATIONAL CONDITION 4, 5 or *, initiate and maintain operation of the OPERABLE emergency filtration system in the pressurization mode of operation.

b. With both emergency filtration system trains inoperable, in OPERATIONAL CONDITION 4, 5 or *, suspend CORE ALTERATIONS, handling of irradiated fuel in the secondary containment and operations with a potential for draining the reactor vessel.

c. The provisions of Specification 3.0.3 are not applicable in Operational Condition *.

SURVEILLANCE REQUIREMENTS

4.7.2 Each control room and auxiliary electric equipment room emergency filtration system 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 filters and charcoal adsorbers and verifying that the train operates for at least 10 hours with the heaters OPERABLE.

---

*When irradiated fuel is being handled in the secondary containment.

#The normal or emergency power source may be inoperable in OPERATIONAL CONDITION 4, 5 or *.

SURVEILLANCE REQUIREMENTS (Continued)

of Less Than 1.0% PENETRATION

GUIDANCE IN

INSERT C

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 train by:

1. Verifying that the train satisfies the in-place testing acceptance criteria and uses the test procedures of Regulatory Positions C.5.a, C.5.c and C.5.d of Regulatory Guide 1.52, Revision 2, March 1978, and the train flow rate is 4000 cfm ± 10%.

2. Verifying within 31 days after removal that a laboratory analysis of a representative carbon sample obtained in accordance with Regulatory Position C.6.b of Regulatory Guide 1.52, Revision 2, March 1978, meets the laboratory testing criteria of Regulatory Position C.6.a of Regulatory Guide 1.52, Revision 2, March 1978.

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##This surveillance shall include the recirculating charcoal filter, "odor eater," in the normal control room supply filter train using ANSI N510-1975 as a guide to verify ≥ 70% efficiency in removing freon test gas.

**Except that recirculating charcoal filter samples shall be removed and analyzed at least once per 18 months.

SURVEILLANCE REQUIREMENTS (Continued)

2. Verifying that on each of the below pressurization mode actuation test signals, the emergency train automatically switches to the pressurization mode of operation and the control room is maintained at a positive pressure of 1/8 inch W.G. relative to the adjacent areas during emergency train operation at a flow rate less than or equal to 4000 cfm:

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BASES

3/4.7.1 CORE STANDBY COOLING SYSTEM - EQUIPMENT COOLING WATER SYSTEMS

The OPERABILITY of the core standby cooling system - equipment cooling water systems and the ultimate heat sink ensure that sufficient cooling capacity is available for continued operation of safety-related equipment during normal and accident conditions. The redundant cooling capacity of these systems, assuming a single failure, is consistent with the assumptions used in the accident conditions within acceptable limits.

3/4.7.2 CONTROL ROOM AND AUXILIARY ELECTRIC EQUIPMENT ROOM EMERGENCY FILTRATION SYSTEM

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INSERT A

ASTM D 3803-79, for a methyl iodide penetration of less than 0.5% when tested at a temperature of 30°C and a relative humidity of 70%.

INSERT B

e. After each complete or partial replacement of a HEPA filter bank by verifying that the HEPA filter banks have a DOP penetration of less than 0.05% when they are tested in-place in accordance with ANSI N510-1975 while operating the system at a flow rate of 4000 CFR ± 10%.

f. After each complete or partial replacement of a charcoal adsorption bank by verifying that the charcoal adsorption beds have a halogenated hydrocarbon refrigerant test gas penetration of less than 0.05% when they are tested in-place in accordance with ANSI N510-1975 while operating the system at a flow rate of 4000 CFR ± 10%.

INSERT C

ASTM D 3803-79, for a methyl iodide penetration of less than 10.0% when tested at a temperature of 30°C and a relative humidity of 70%.

INSERT D

e. After each complete or partial replacement of a HEPA filter bank by verifying that the HEPA filter banks have a DOP penetration of less than 1.0% when they are tested in-place in accordance with ANSI N510-1975 while operating the system at a flow rate of 4000 CFR ± 10%.

f. After each complete or partial replacement of a charcoal adsorption bank by verifying that the charcoal adsorption beds have a halogenated hydrocarbon refrigerant test gas penetration of less than 1.0% when they are tested in-place in accordance with ANSI N510-1975 while operating the system at a flow rate of 4000 CFR ± 10%.

ATTACHMENT C

SIGNIFICANT HAZARDS CONSIDERATION

Commonwealth Edison has evaluated the proposed Technical Specification Amendment and determined that it does not represent a significant hazards consideration. Based on the criteria for defining a significant hazards consideration established in 10 CFR 50.92, operation of LaSalle County Station Units 1 and 2 in accordance with the proposed amendment, will not:

1) Involve a significant increase in the probability or consequences of an accident previously evaluated because:

   The proposed amendments to the testing criteria for the VG and VC charcoal adsorption beds revises the acceptance criteria for methyl iodide penetration and specifies the laboratory testing method. The proposed Technical Specification penetration acceptance criterion is less conservative than the existing values. This reduction in conservatism will be addressed by station procedures which will increase the testing frequency as the penetration values increase (See Table 1 attached). The laboratory testing method that the station currently uses is ASTM D 3803-79. This test is not referenced in the applicable regulatory documents to which the station is committed (Regulatory Guide 1.52, Revision 2 and ANSI N510-1975). However, this test is referenced in ANSI N510-1980 and is the current industry standard.

   References to the "control room and auxiliary electric equipment room emergency filtration system" are being revised to the "control room emergency filtration system because the emergency filter system is part of the VC system. This revision is not removing any equipment only clarifying the nomenclature of an existing piece of equipment.

   Analysis has shown that the control room recirculating charcoal filter is not required to maintain the control room environment under accident conditions. Therefore, removal of the references to this filter from the Technical Specifications will not increase the probability or consequences of a previously evaluated event.

2. Create the possibility of a new or different kind of accident from any accident previously evaluated because:

   The VG and VC systems are intended to mitigate the consequences of an accident and cannot, by themselves, initiate an accident. No new accidents are postulated to occur as a result of this proposal.

3) Involve a significant reduction in the margin of safety because:

The proposed amendment explicitly states the acceptance criteria used for VG and VC system HEPA and charcoal bed in-place testing. These values were derived from the referenced document and do not represent a change to the Technical Specifications. Addition of the acceptance criteria values will help to ensure that the requirements of the Technical Specifications and all governing documents are met, therefore, the margin of safety is unaffected.

The relaxation of the laboratory analysis acceptance criteria will decrease the margin of safety slightly. However, since the assumed analytical values for the charcoal bed efficiencies will still result in a dose well below the limits established in 10 CFR 50, Appendix A, GDC 19, the decrease in the margin of safety will be offset in part by the establishment of proceduralized controls. These controls will establish acceptance criterion (action levels) conservative to the proposed Technical Specification values. While the relaxed Technical Specification acceptance criteria will allow more operational flexibility, the action levels establish requirements for increased testing frequencies and actions which will help ensure that the Technical Specification and the analytical limits are not exceeded.

The removal of references to the AEER emergency filtration system from the Technical Specifications will not reduce the margin of safety because this is only an editorial change. The control room recirculating charcoal filter is not addressed in the Technical Specification bases and has been shown by analysis to be unnecessary to ensure control room habitability under accident conditions, therefore, removal of references to this equipment from the Technical Specifications does not reduce the margin of safety.

Guidance has been provided in "Final Procedures and Standards on No Significant Hazards Considerations", Final Rule, 51 FR 774, for the application of standards to license change requests for determination of the existence of significant hazards considerations. This proposed amendment most closely resembles Example I.C.2.e.vi of the examples which do not involve a significant hazards consideration, "a change which either may result in some increases to the probability or consequences of a previously analyzed accident or may reduce in some way a safety margin, but where the results of the change are clearly within all acceptable criteria with respect to the system or component specified in the Standard Review Plan, e.g., a change resulting from the application of a small refinement of a previously used calculational model or design method. This proposed amendment does <u>not</u> involve a signifcant relaxation of the criteria used to establish safety limits, a significant relaxation of the bases for the limiting safety system settings or a significant relaxation of the bases for the limiting conditions for operations. Therefore, based on the guidance provided in the Federal Register and the criteria established in 10CFR50.92(e), the proposed change does not constitute a significant hazards consideration.

ATTACHMENT D

REFERENCES

a. 10 CFR 50, Appendix A, General Design Criteria for Nuclear Power Plants, Criteria 19 - Control Room.

b. USAEC-RDT Standard RDT M 16-1T, October 1973, "Gas-Phase Absorbents for Trapping Radioactive Iodine and Iodine Compounds."

c. ANSI/ASME N510-1975, "Testing of Nuclear Air-Cleaning Systems".

d. ANSI ASME N509 1976, "Nuclear Power Air Cleaning Units and Components".

e. NRC Regulatory Guide 1.52, Revision 2, March 1978, "Design, Testing, and Maintenance Criteria for Post Accident Engineered-Safety-Feature Atmosphere Cleanup System Air Filtration and Adsorption Units of Light-Water-Cooled Nuclear Power Plants".

f. ASTM D 3803-79, "Standard Test Methods for Radio-iodine Testing of Nuclear-Grade Gas-Phase Absorbents".

g. ANSI/ASME N510-1980 (Revision of N510-1975), "Testing of Nuclear Air-Cleaning Systems".

h. Generic Letter 83-13, dated March 2, 1983, "Clarification of Surveillance Requirements for HEPA Filters and Charcoal Absorber Units in Standard Technical Specifications on ESF Cleanup Systems".

i. NRC Information Notice 87-32, dated July 10, 1987, "Deficiencies in the Testing of Nuclear-Grade Activated Charcoal".

j. Dr. J. Benton, S&L HVAC Project Engineer, letter to M.L. Reed dated June 21, 1989, "Commonwealth Edison Company LaSalle County Station, Units 1 and 2 - System Code VC, VE, VG and VQ, WIN 1060".

k. G.J. Diederich letter to Director of Nuclear Reactor Regulation, dated June 26, 1989, transmitting Licensee Event Report #89-019-00, Docket No. 50-373, "Charcoal Laboratory Sample Results Out-of-Tolerance".

l. L.R. Gregor, NRC Chief Reactor Programs Branch, letter to Mr. Cordell Reed, Commonwealth Edison dated June 30, 1989, transmitting Inspection Report 50-373/89014 (DRSS); 50-374/89014 (DRSS).

m. T.J. Kovach letter to A.B. Davis, NRC Regional Administrator, dated July 31, 1989, "LaSalle Counth Station Units 1 and 2, Response to Inspection Report Nos. 50-373/89014 and 50-374/89014.

n. M.L. Reed letter to G.J. Diederich dated, October 16, 1989 "LaSalle County Station Units 1 and 2."

REFERENCE n.

INTRODUCTION

A review of the La Salle County Station (LSCS) Technical Specifications, Test Procedures, and Updated Final Safety Analysis Report (UFSAR) has identified the need to revise these documents for internal consistency. Radiological analyses, which are based on some of the identified parameters being changed in the Technical Specification and UFSAR, would also require revision.

This report summarizes the principal assumptions used to recalculate the design-basis post accident radiological doses in the plant's main control room and at the offsite points of interest, namely, the Exclusion Area Boundary (EAB) and Low Population Zone (LPZ). The resulting doses are then compared to the licensing acceptance criteria of 10CFR50 (Appendix A, Criterion 19) and 10 CFR100.

RADIOLOGICAL DOSE MODELING

The calculation of postaccident radiological doses requires a number of separate steps, each of which is governed by plant or site parameters. Each will be discussed separately.

Briefly, the dose assessment process consists of

1. Identifying the design-basis accident and core release of radionuclides (that is, identifying the "Source Term").

2. Quantifying the removal of radionuclides in the primary containment by mechanisms such as plate-out, spray removal, and suppression pool scrubbing.

3. Quantifying the release from the primary containment.

4. Quantifying the movement (and removal) of radioactivity in the secondary containment (reactor building) and the release to the environment.

5. Estimating atmospheric dispersion to the sites of interest.

6. For control rooms, model the movement (and removal) of radioactivity by the control room ventilation system.

7. For offsite locations, estimate local concentrations.

8. Given the radionuclide concentrations, calculate the resulting doses over the time periods of interest

9. Compare the resulting doses with appropriate regulatory acceptance criteria.

PRINCIPAL ASSUMPTIONS

Source Term

The design-basis accident selected for this assessment is the loss-of-coolant accident (LOCA) quantified in Regulatory Guide 1.3 (Reference 1). The radionuclide releases given in this reference are used in the subsequent dose assessments.

Removal of Radionuclides Within Containment

Standard Review Plan 6.5.5 (Reference 2) permits removal of 90% of the elemental and particulate forms of iodine by scrubbing in BWR Mark II design suppression pools. This credit (a "decontamination factor," DF of 10) is taken in the present assessment.

Release of Radioactivity from Primary Containment

Two principle pathways for release of radioactivity from the primary containment have been identified and will be addressed. Others will be discussed and disposed of.

Leakage from Primary Containment. Radioactivity in the primary containment is presumed to leak through multiple pathways to the reactor building (secondary containment) at the primary containment Technical Specification leak rate of 0.635% per day (Reference 3). This leak rate is assumed to persist throughout the course of the accident.

Leakage through MSIV's. Radioactivity is also presumed to leak from primary containment through the main steam isolation valves (MSIV). The Technical Specification leak rate for the MSIV's is a total of 100 scfh for 4 lines (or 25 scfh per line) (Reference 4). Following the accident scenario of the LSCS Safety Evaluation Report (SER) prepared by the Nuclear Regulatory Commission (NRC), the MSIV leakage scenarios proceeds as follows: One line leaks at 25 scfh for 20 minutes prior to initiation of the MSIV leakage control system (MSIV-LCS). Thereafter all four lines leak at 25 scfh each, but this leakage is picked up by the MSIV-LCS and returned to the reactor building (see Reference 5). The MSIV-LCS is assumed to be made operational 20 minutes after the onset of the LOCA (Reference 6).

In the present assessment, the leakage through the MSIV's is not released unencumbered to the environment. Credit for elemental iodine plate-out in the steam line is taken. A maximum of 100 is taken for this effect. The plate-out model was taken from NUREG/CR-0009 (Reference 7) and was previously used in the Dresden and Quad Cities Control Room Habitability assessments. (References 8 and 9).

Before the MSIV-LCS is started, MSIV leakage moves through long lengths (more than 100 feet) of large diameter pipe (22" diameter) before approaching a release point such as turbine gland seals or the main condenser. At the low leak rates (25 scfh) considered, ample opportunity exists for iodine removal. Further, iodine reaching the condenser has a large, cool wet surface area on which to plate-out. Leakage from the turbine gland seals may then plate out in the turbine building or be exhausted by the ventilation system. In short, ample opportunity for iodine removal in the MSIV leakage pathway exists. Credit was taken only for steam line plate-out.

Leakage through Other Piping Systems Bypassing Secondary Containment. The possibility of leakage through specific piping systems, other than the MSIV's has been addressed. These pathways and the reason for them not to be considered viable leakage pathways are given in the FSAR (Reference 10).

Leakage through CRD Hydraulic Lines. General Electric and the NRC have generically identified another possible leakage pathway that may not have been previously considered. That pathway is via the Control Rod Drive (CRD) hydraulic lines under certain circumstances (Reference 11). This pathway is being reviewed for LSCS to determine if it is significant to control room habitability.

RELEASE TO THE ENVIRONMENT

Radioactivity in the reactor building is exhausted through the Standby Gas Treatment System (SGTS) to a 113 meter tall stack. Although the normal reactor building ventilation system maintains this building at -0.25 inch WG, this system is presumed to be non-operational at the time of SGTS initiation. The SGTS then draws the building pressure down to -0.25 inch WG in 5 minutes as required by Technical Specification (Reference 12).

In the 5 minutes prior to having a fully operational SGTS, radioactivity released to the reactor building is immediately assumed to be released, unfiltered, through the building walls at ground level.

The SGTS filter unit contains an 8-inch thick nuclear grade carbon filter (Reference 13) designed in accordance with Regulatory Guide 1.52 (Reference 14). When operational, it is assumed that the SGTS removes iodine with 99% efficiency as shown in Table 1. This assigned removal efficiency is consistent with the Specifications of Table 2 in Regulatory Guide 1.52.

Releases from MSIV leakage in the 20 minutes prior to operation of the MSIV-LCS are assumed to be unfiltered and at ground level. After the MSIV-LCS is operational, this leakage is exhausted by the SGTS.

Conservatively, no credit is taken for the mixing or holdup of radionuclides in the reactor building.

ATMOSPHERIC DISPERSION

Atmospheric dispersion factors for offsite dose assessments were taken from Regulatory Guide 1.3 (Reference 1) and were conservatively higher than those in the UFSAR (Reference 15).

Atmospheric dispersion factors for the control room habitability assessments were recalculated from a 5 year meteorology data file for the LSCS site. Atmospheric dispersion factors (X/Q) for ground level releases were calculated using the methodology of the Murphy-Campe paper (Reference 16) Releases from the 115 m tall stack ordinarily would not enter the control room intakes. However, for conservatism, a fumigation condition is assumed to occur bringing the stack release into the building wake, which would then be available for intake to the control room.

CONTROL ROOM DOSE MODELING

In order to calculate the radiological doses in the control room, a model of its HVAC system is necessary. The LSCS HVAC system is shown in Figure 1. Under accident conditions the emergency makeup fan supplies air to the control room at the rate of 1500 cfm. The control room emergency filter unit contains a two-inch thick nuclear grade carbon filter (Reference 17) designed in accordance with Regulatory Guide 1.52 (Reference 14). This filter train is assumed to have an iodine removal efficiency of 90% (See Table 1). This value is conservative as it is less than that allowed by Table 2 of Regulatory Guide 1.52.

Unfiltered air inleakage at various points in the system are also noted on Figure 1. These data are taken from pre-op tests (for ductwork) and manufacturers' data (for dampers). No credit is taken for iodine removal by the recirculation ("odor eater") filter train which contains a two-inch thick nuclear grade carbon bed.

The Murphy-Campe paper (Reference 16) parameters for control room occupancy factors were used in the assessment.

OFFSITE DOSE MODELING

Offsite doses were calculated using the methodology and data of Regulatory Guide 1.3 (Reference 1).

RESULTS

The results of this assessment are given in Table 2. All results are within applicable regulatory criteria.

A detailed calculation supporting these results is available. (Reference 18)

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REFERENCES

1. US Nuclear Regulatory Commission, "Assumptions Used for Evaluating the Potential Radiological Consequences of a Loss of Coolant Accident for Boiling Water Reactors," Regulatory Guide 1.3, Revision 2, June 1974.

2. US Nuclear Regulatory Commission, "Pressure Suppression Pool As A Fission Product Cleanup System," Standard Review Plant 6.5.5, Revision 0, December 1988.

3. La Salle County Station, Technical Specification 3/4.6.1, "Primary Containment," Section 3.6.1.2.a.

4. La Salle County Station, Technical Specification 3/4.6.1, "Primary Containment," Section 3.6.1.2.b.

5. US Nuclear Regulatory Commission, "Safety Evaluation Report related to the Operation of La Salle County Station Units 1 and 2," NUREG-0519, March 1981, Subsection 15.3.2.2.

6. La Salle County Station, Updated Final Safety Analysis Report (UFSAR), Subsection 6.7.1.1.f.1.

7. A. K. Postma, R. R. Sherry and P. S. Tam, "Technological Bases for Models of Spray Washout of Airborne Contaminants in Containment Vessels," NUREG/CR-0009, October 1978.

8. Dresden Control Room Habitability Assessment. Attachment to Letter, E. D. Swartz of Commonwealth Edison To D. G. Eisenhut, USNRC, "Dresden Station, Units 2 and 3, Quad Cities Station, Units 1 and 2, and Zion Station Units 1 and 2, Supplemental Response to NUREG-0737, Item III.D.3.4.

9. Quad Cities Control Room Habitability Assessment. Attachment to Letter, E. D. Swartz of Commonwealth Edison To D. G. Eisenhut, USNRC, "Dresden Station, Units 2 and 3, Quad Cities Station, Units 1 and 2, and Zion Station Units 1 and 2, Supplemental Response to NUREG-0737, Item III.D.3.4.

10. La Salle County, Final Safety Analysis Report, Questions 021.11 and 021.25 and their responses.

11. Letter, J. E. Morrison of General Electric to T. J. Kovach of Commonwealth Edison, "GE PRC 89-15, CRD System Leakage During LOCA, July 13, 1989.

12. LaSalle County Station, Technical Specification 3/4.6.5, "Secondary Containment," Section 4.6.5.1.c.

13. LaSalle County Station, UFSAR, Table 6.5-1.

14. US Nuclear Regulatory Commission, "Design, Testing and Maintenance Criteria for Postaccident Engineered-Safety-Feature Atmospheric Cleanup System Air Filtration and Adsorptio Units of Light-Water-Cooled Nuclear Power Plants," Regulatory Guide 1.52, Revision 2, March 1978.

15. LaSalle County Station, UFSAR, Table 15.6-9.

16. K. G. Murphy and K. M. Campe, "Nuclear Power Plant Control Room Ventilation System Design for Meeting General Criterion 19," 13th AEC Air Cleaning Conference, 1974.

17. La Salle County Station, UFSAR, Table 9.4-1.

18. Sargent & Lundy Calculation 1-CT-2, "Control Room Doses from Inside Atmosphere After LOCA," Revisions 1 and 3, 1989.

Table 1 Charcoal Performance Criteria

(Proposed)

	Standby Gas Treatment System Filter (8-inch bed)		Control Room Emergency Filter (2-inch bed)	
	Efficiency	Penetration	Efficiency	Penetration
Procedural Initial Action Level	$\leq$ 99.825%	$\geq$ 0.175%	$\leq$ 98.0%	$\geq$ 2.0%
Technical Specification LCO Action Level	$\leq$ 99.5%	$\geq$ 0.5%	$\leq$ 90%	$\geq$ 10.0%
Radiological Dose Assessment Basis	99.0%	1%	90%	10%
Applicable Technical Specification	3/4.6.5 (Subsections 4.6.5.3 b, c and f)		3/4.7.2 (Subsections 4.7.2 b, c and f)	

Table 2

RESULTS

1. ATMOSPHERIC DISPERSION FACTOR

Release	X/Q, s/m^3		
	Control Room	EAB (509 m)	LPZ (6400m)
Stack Release			
Fumigation - first 30 minutes	2.65×10^{-4}	1.85×10^{-4}	2.3×10^{-5}
Elevated Release			
30 min - 8 hr	0	1.7×10^{-5}	6.0×10^{-6}
8 hr - 24 hr	0		1.9×10^{-6}
24 hr - 96 hr	0		6.1×10^{-7}
96 hr - 720 hr	0		1.9×10^{-7}
Ground Level Releases			
Reactor Building Exfiltration	2.65×10^{-4}	6.8×10^{-4}	3.9×10^{-5}
MSIV Leakage	2.65×10^{-4}	6.8×10^{-4}	3.9×10^{-5}

Table 2, continued

RESULTS

2. RADIOLOGICAL DOSES IN CONTROL ROOM

Source	Thyroid	Doses, rem Whole Body	Skin
Primary Containment			
- 5 minute exfiltration	3.938	0.021	0.27
- SGTS stack release	.196	0.086	1.03
MSIV Leakage			
- 20 minute initial release	2.161	0.014	0.17
- SGTS stack release	.043	0.024	0.29
Total	6.34	0.145	1.76
10CFR50, Appendix A, GDC19 Limits	30	5	30

Table 2, continued

RESULTS

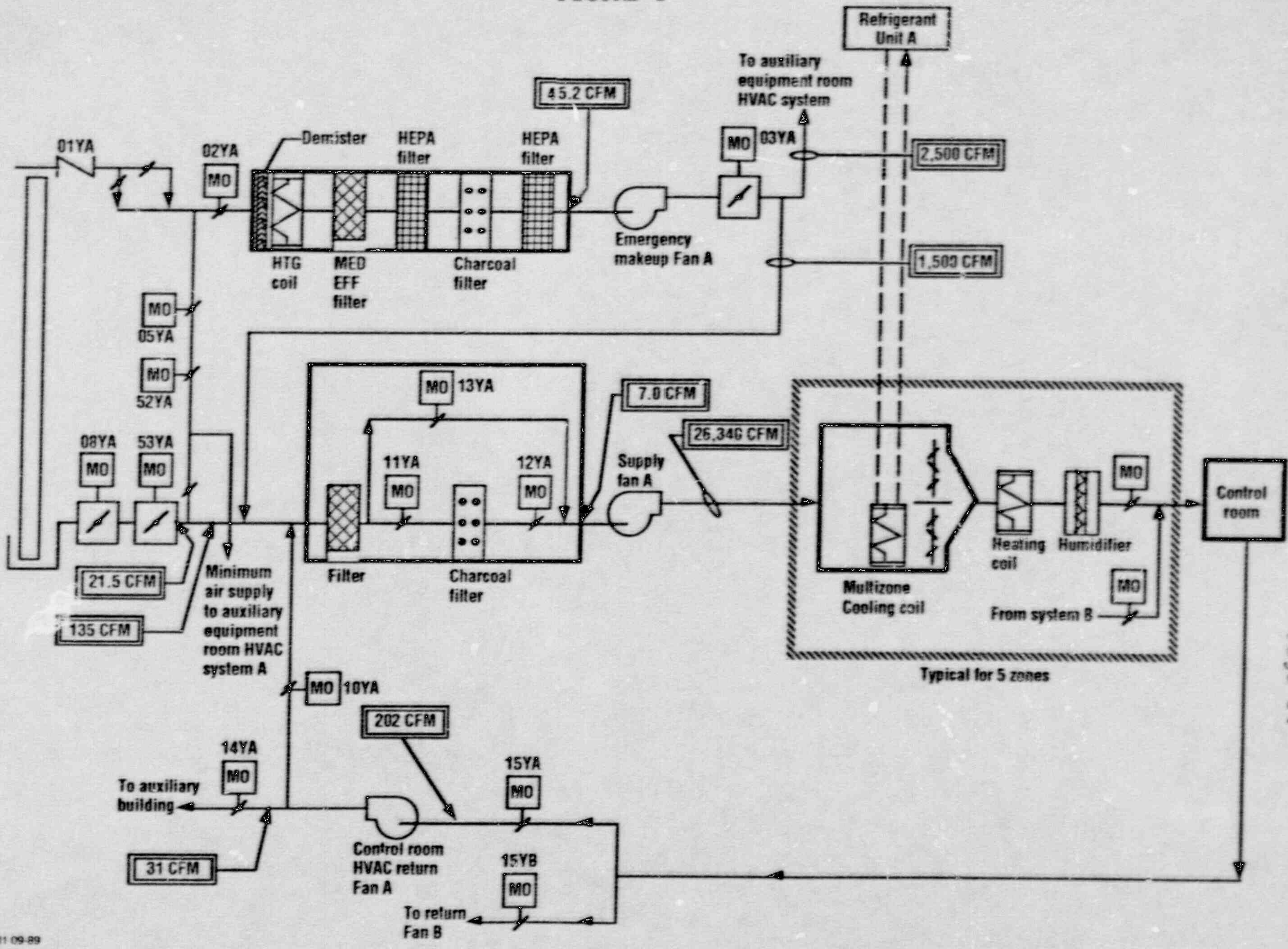
3. OFFSITE DOSES

Source	Exclusion Area Boundary Thyroid	Exclusion Area Boundary Whole Body	Low Population Zone Thyroid	Low Population Zone Whole Body
Primary Containment				
- 5 minute exfiltration	34.8	2.7	1.99	0.15
- SGTS stack release	0.7	2.8	0.59	0.80
MSIV Leakage				
- 20 minute initial release	19.1	1.5	1.10	0.08
- SGTS stack release	0.2	1.1	0.31	0.48
Total	54.8	8.1	4.0	1.5
10 CFR 100 Limits	300	25	300	25

LaSalle

Control Room HVAC (Identical to Train B) Inleakage

FIGURE 1



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