ATTACHMENT "A"

EXISTING SPECIFICATIONS
UNIT 2

3/4.7.5 CONTROL ROOM EMERGENCY AIR CLEANUP SYSTEM*

LIMITING CONDITION FOR OPERATION

3.7.5 Two independent control room emergency air cleanup systems shall be OPERABLE.

APPLICABILITY: ALL MODES or during movement of irradiated fuel assemblies.

ACTION:

Unit 2 or 3 in MODE 1, 2, 3 or 4:

With one control room emergency air cleanup 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.

Units 2 or 3 in MODE 5 or 6; or defueled when moving irradiated fuel assemblies.

a. With one control room emergency air cleanup system inoperable, restore the inoperable system to OPERABLE status within 7 days or initiate and maintain operation of the remaining OPERABLE control room emergency air cleanup system in the recirculation mode.

b. With both control room emergency air cleanup systems inoperable, or with the OPERABLE control room emergency air cleanup system required to be in the recirculation mode by ACTION (a), not capable of being powered by an OPERABLE emergency power source, suspend all operations involving CORE ALTERATIONS or positive reactivity changes; or movement of irradiated fuel assemblies.

c. The provisions of Specification 3.0.3 are not applicable in MODE 6.

d. The provisions of Specification 3.0.4 are not applicable when entering MODES 5, 6, or defueled configuration.

SURVEILLANCE REQUIREMENTS

4.7.5 Each control room emergency air cleanup system shall be demonstrated OPERABLE:

a. At least once per 12 hours by verifying that the control room air temperature is less than or equal to 110°F.

b. At least once per 31 days on a STAGGERED TEST BASIS by imitating, from the control room, flow through the HEPA filters and charcoal adsorbers and verifying that the system operates for at least 10 hours with the heaters on.

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 with the system operating at a flow rate of 35485 cfm ± 10% for the air conditioning unit, and 2050 ± 150 cfm for the ventilation unit and recirculating through the respective HEPA filters and charcoal adsorbers, leakage through the system diverting valves is less than or equal to 1% air conditioning unit and 1% ventilation unit when the system is tested by admitting cold DOP at the respective intake.

*Shared system with San Onofre - Unit 3.

2. Verifying that the cleanup system 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 2050 ± 150 cfm for the ventilation unit and 35,485 cfm ± 10% for the air conditioning unit.

3. 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.

4. Verifying a system flow rate of 2050 ± 150 cfm for the ventilation unit and 35,485 cfm ± 10% for the air conditioning unit during system operation when tested in accordance with ANSI N510-1975.

d. 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.

e. 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 7.0 inches Water Gauge ventilation unit and less than 7.3 inches Water Gauge air conditioning unit while operating the system at a flow rate of 2050 ± 150 cfm for the ventilation unit and 35,485 cfm ± 10% for the air conditioning unit.

2. Verifying that on a control room isolation test signal, the system automatically switches into the emergency mode of operation with flow through the HEPA filters and charcoal adsorber banks.

3. Verifying that on a toxic gas isolation test signal, the system automatically switches into the isolation mode of operation with flow through the HEPA filters and charcoal adsorber banks.

4. Verifying that the system maintains the control room at a positive pressure of greater than or equal to 1/8 inch W.G. relative to the outside atmosphere during system operation in the emergency mode.

5. Verifying that the heaters dissipate 4.8 kw ± 5% when tested in accordance with ANSI N510-1975.

SURVEILLANCE REQUIREMENTS (Continued)

f. After each complete or partial replacement of a HEPA filter bank by verifying that the HEPA filter banks remove greater than or equal to 99.95% of the DOP when they are tested in-place in accordance with ANSI N510-1975 while operating the system at a flow rate of 2050 ± 150 cfm for the ventilation unit and 35,485 cfm ± 10% for the air conditioning unit.

g. After each complete or partial replacement of a charcoal adsorber bank by verifying that the charcoal adsorbers remove greater than or equal to 99.95% 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 2050 ± 150 cfm for the ventilation unit and 35,485 cfm ± 10% for the air conditioning unit.

FEB 18 1987
AMENDMENT NO. 14

3/4.7.5 CONTROL ROOM EMERGENCY AIR CLEANUP SYSTEM

The OPERABILITY of the control room emergency air cleanup 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.

Cumulative operation of the system with the heaters on for at least 10 hours over a 31 day period is sufficient to reduce the buildup of moisture on the adsorbers and HEPA filters.

ATTACHMENT "B"

EXISTING SPECIFICATIONS
UNIT 3

3/4.7.5 CONTROL ROOM EMERGENCY AIR CLEANUP SYSTEM*

LIMITING CONDITION FOR OPERATION

3.7.5 Two independent control room emergency air cleanup systems shall be OPERABLE.

APPLICABILITY: ALL MODES

ACTION:

Unit 2 or 3 in MODES 1, 2, 3 or 4:

With one control room emergency air cleanup 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.

Units 2 and 3 in MODES 5 or 6:

a. With one control room emergency air cleanup system inoperable, restore the inoperable system to OPERABLE status within 7 days or initiate and maintain operation of the remaining OPERABLE control room emergency air cleanup system in the recirculation mode.

b. With both control room emergency air cleanup systems inoperable, or with the OPERABLE control room emergency air cleanup system required to be in the recirculation mode by ACTION (a), not capable of being powered by an OPERABLE emergency power source, suspend all operations involving CORE ALTERATIONS or positive reactivity changes.

c. The provisions of Specification 3.0.3 are not applicable in MODE 6.

SURVEILLANCE REQUIREMENTS

4.7.5 Each control room emergency air cleanup system shall be demonstrated OPERABLE:

a. At least once per 12 hours by verifying that the control room air temperature is less than or equal to 110°F.

b. At least once per 31 days on a STAGGERED TEST BASIS by initating, from the control room, flow through the HEPA filters and charcoal adsorbers and verifying that the system operates for at least 10 hours with the heaters on.

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 with the system operating at a flow rate of 35485 cfm ± 10% for the air conditioning unit, and 2050 ± 150 for the ventilation unit and recirculating through the respect HEPA filters and charcoal adsorbers, leakage through the syste diverting valves is less than or equal to 1% air conditioning unit and 1% ventilation unit when the system is tested by admitting cold DOP at the respective intake.

*Shared system with San Onofre - Unit 2.

SURVEILLANCE REQUIREMENTS (Continued)

2. Verifying that the cleanup system 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 2050 ± 150 cfm for the ventilation unit and 35,485 cfm ± 10% for the air conditioning unit.

3. Verifying within 31 days after removal that a laboratory analysis of a representative carbon sample obtained in accordance with Regulatory Position C.5.b of Regulatory Guide 1.52, Revision 2, March 1978, meets the laboratory testing criteria of Regulatory Position C.5.a of Regulatory Guide 1.52, Revision 2, March 1978.

4. Verifying a system flow rate of 2050 ± 150 cfm for the ventilation unit and 35,485 cfm ± 10% for the air conditioning unit during system operation when tested in accordance with ANSI N510-1975.

d. 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.5.b of Regulatory Guide 1.52, Revision 2, March 1978, meets the laboratory testing criteria of Regulatory Position C.5.a of Regulatory Guide 1.52, Revision 2, March 1978.

e. 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 7.0 inches Water Gauge ventilation unit and less than 7.3 inches Water Gauge air conditioning unit while operating the system at a flow rate of 2050 ± 150 cfm for the ventilation unit and 35,485 cfm ± 10% for the air conditioning unit.

2. Verifying that on a control room isolation test signal, the system automatically switches into the emergency mode of operation with flow through the HEPA filters and charcoal adsorber banks.

3. Verifying that on a toxic gas isolation test signal, the system automatically switches into the isolation mode of operation with flow through the HEPA filters and charcoal adsorber banks.

4. Verifying that the system maintains the control room at a positive pressure of greater than or equal to 1/8 inch W.G. relative to the outside atmosphere during system operation in the emergency mode.

5. Verifying that the heaters dissipate 4.8 kw ± 5% when tested in accordance with ANSI N510-1975.

FEB 18 1983

AMENDMENT NO. 3

SURVEILLANCE REQUIREMENTS (Continued)

f. After each complete or partial replacement of a HEPA filter bank by verifying that the HEPA filter banks remove greater than or equal to 99.95% of the DOP when they are tested in-place in accordance with ANSI N510-1975 while operating the system at a flow rate of 2050 ± 150 cfm for the ventilation unit and 35,485 cfm ± 10% for the air conditioning unit.

g. After each complete or partial replacement of a charcoal adsorber bank by verifying that the charcoal adsorbers remove greater than or equal to 99.95% 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 2050 ± 150 cfm for the ventilation unit and 35,485 cfm ± 10% for the air conditioning unit.

FEB 2 8 1980

AMENDMENT NO. 3

3/4.7.5 CONTROL ROOM EMERGENCY AIR CLEANUP SYSTEM

The OPERABILITY of the control room emergency air cleanup 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.

Cumulative operation of the system with the heaters on for at least 10 hours over a 31-day period is sufficient to reduce the buildup of moisture on the adsorbers and HEPA filters.

NOV 15 1982

NPF-10/15-407

ATTACHMENT "C"

PROPOSED SPECIFICATIONS
UNIT 2

3/4.7.5 CONTROL ROOM EMERGENCY AIR CLEANUP SYSTEM*

LIMITING CONDITION FOR OPERATION

3.7.5 Two independent control room emergency air cleanup systems shall be OPERABLE.

APPLICABILITY: ALL MODES or during movement of irradiated fuel assemblies.

ACTION: Each Unit shall enter applicable ACTIONS separately PCN 407

Unit 2 or 3 in MODE 1, 2, 3 or 4:

With one control room emergency air cleanup 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.

Units 2 or 3 in MODE 5 or 6; or defueled when moving irradiated fuel assemblies.

a. With one control room emergency air cleanup system inoperable, restore the inoperable system to OPERABLE status within 7 days or initiate and maintain operation of the remaining OPERABLE control room emergency air cleanup system in the recirculation mode.

b. With both control room emergency air cleanup systems inoperable, or with the OPERABLE control room emergency air cleanup system required to be in the recirculation mode by ACTION (a), not capable of being powered by an OPERABLE emergency power source, suspend all operations involving CORE ALTERATIONS or positive reactivity changes; or movement of irradiated fuel assemblies.

c. The provisions of Specification 3.0.3 are not applicable in MODE 6.

d. The provisions of Specification 3.0.4 are not applicable when entering MODES 5, 6, or defueled configuration.

SURVEILLANCE REQUIREMENTS

4.7.5 Each control room emergency air cleanup system shall be demonstrated OPERABLE:

a. At least once per 12 hours by verifying that the control room air temperature is less than or equal to 110°F.

b. At least once per 31 days on a STAGGERED TEST BASIS by imitating, from the control room, flow through the HEPA filters and charcoal adsorbers and verifying that the system operates for at least 2 10 hours with the heaters on

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:

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9 35,705 9 35485

1. Verifying that with the system operating at a flow rate of cfm ± 10% for the air conditioning unit, and 2050 ± 150 cfm for the ventilation unit and recirculating through the respective HEPA filters and charcoal adsorbers, leakage through the system diverting valves is less than or equal to 1% air conditioning unit and 1% ventilation unit when the system is tested by admitting cold DOP at the respective intake.

PCN 407

*Shared system with San Onofre - Unit 3.

SURVEILLANCE REQUIREMENTS (Continued)

2. Verifying that the cleanup system 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 2050 ± 150 cfm for the ventilation unit and 35,485 cfm ± 10% for the air conditioning unit. 35,705 | 52

3. 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.

4. Verifying a system flow rate of 2050 ± 150 cfm for the ventilation unit and 35,485 cfm ± 10% for the air conditioning unit during system operation when tested in accordance with ANSI N510-1975. 35,705 | 52

d. 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.

e. 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 7.0 inches Water Gauge ventilation unit and less than 7.3 inches Water Gauge air conditioning unit while operating the system at a flow rate of 2050 ± 150 cfm for the ventilation unit and 35,485 cfm ± 10% for the air conditioning unit. 35,705 | 52

2. Verifying that on a control room isolation test signal, the system automatically switches into the emergency mode of operation with flow through the HEPA filters and charcoal adsorber banks.

3. Verifying that on a toxic gas isolation test signal, the system automatically switches into the isolation mode of operation with flow through the HEPA filters and charcoal adsorber banks.

4. Verifying that the system maintains the control room at a positive pressure of greater than or equal to 1/8 inch W.G. relative to the outside atmosphere during system operation in the emergency mode.

5. Verifying that the heaters dissipate 4.8 kw ± 5% when tested in accordance with ANSI N510-1975. | RAI 040.2

SURVEILLANCE REQUIREMENTS (Continued)

f. After each complete or partial replacement of a HEPA filter bank by verifying that the HEPA filter banks remove greater than or equal to 99.95% of the DOP when they are tested in-place in accordance with ANSI N510-1975 while operating the system at a flow rate of 2050 ± 150 cfm for the ventilation unit and (35,485) 35,705 cfm ± 10% for the air conditioning unit. S1

g. After each complete or partial replacement of a charcoal adsorber bank by verifying that the charcoal adsorbers remove greater than or equal to 99.95% 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 2050 ± 150 cfm for the ventilation unit and (35,485) 35,705 cfm ± 10% for the air conditioning unit. S2

3/4.7.5 CONTROL ROOM EMERGENCY AIR CLEANUP SYSTEM

The CREACUS provides a protected environment from which operators can control the plant following an uncontrolled release of radioactivity, or toxic gas.

The CREACUS consists of two independent, redundant trains that recirculate and filter the control room air. Each train consists of a prefilter, a high efficiency particulate air (HEPA) filter, an activated charcoal adsorber section for removal of gaseous activity (principally iodine), and a fan. A second bank of HEPA filter follows the adsorber section (for emergency air conditioning unit only) and is used to retain carbon fines downstream of carbon adsorber. Each emergency ventilation air supply unit includes prefilter, HEPA filter, charcoal adsorber, and fan. Ductwork, motor-operated dampers, and instrumentation also form part of the system. Air and motor-operated dampers are provided for air volume control and system isolation purposes.

Upon receipt of the actuating signal, normal air supply to the control room is isolated, and the stream of ventilation air is recirculated through the system's filter trains. The prefilters remove any large particles in the air to prevent excessive loading of the HEPA filters and charcoal adsorbers. Continuous operation of each train for at least 15 minutes per month verifies proper system operation.

There are two CREACUS operational modes. Emergency mode is an operational mode when the control room is isolated to prevent operation personnel from the radioactive exposure through the duration of any one of the postulated limiting faults discussed in FSAR, Chapter 15. Isolation mode is an operational mode when control room is isolated to protect operation personnel from toxic gases and smoke.

Actuation of the CREACUS places the system into either of two separate states of the operation, depending on the initiation signal. Actuation of the system to the emergency mode of operation closes the unfiltered-outside-air intake and exhaust dampers and aligns the system for recirculation of control room air through the redundant trains of HEPA and charcoal filters. The emergency mode initiates pressurization of the control room. Outside air is added to the air being recirculated from the control room.

Pressurization of the control room prevents infiltration of infiltered air from the surrounding areas of the building.

The actions taken in the toxic gas isolation mode are the same, except that the signal switches control room ventilation to an isolation mode, preventing outside air from entering the control room.

3/4.7.5 CONTROL ROOM EMERGENCY AIR CLEANUP SYSTEM (continued)

The control room supply and the outside air supply of the normal control room HVAC is monitored by radiation and toxic-gas detectors respectively. One detector output above the setpoint will cause actuation of the emergency mode or isolation mode as required. The actions of the toxic gas isolation mode are more restrictive, and will override the actions of the emergency radiation mode. However, toxic gas and radiation events are not considered to occur concurrently.

A single train will pressurize the control room to at least 0.125 inches water gauge, and provides an air exchange rate in excess of 45% per hour.

Redundant recirculation trains provide the required filtration should an excessive pressure drop develop across the other filter train. Normally open isolation dampers are arranged in series pairs so that the failure of one damper to shut will not result in a breach of isolation. The CREACUS is designed in accordance with Seismic Category 1 requirements.

The CREACUS is designed to maintain the control room environment for 30 days of continuous occupancy after a Design Basis Accident (DBA) without exceeding a 5 rem whole body dose.

Cumulative operation of the system for at least 2 hours over a 31 day period is sufficient to reduce the buildup of moisture on the adsorbers and HEPA filters. 2 hours time frame is based on conservative engineering evaluation which calculated the time required to evaporate the moisture contained in the air trapped inside the CREACUS duct upstream of charcoal beds.

NPF-10/15-4C7

ATTACHMENT "D"

PROPOSED SPECIFICATIONS
UNIT 3

3/4.7.5 CONTROL ROOM EMERGENCY AIR CLEANUP SYSTEM*

LIMITING CONDITION FOR OPERATION

3.7.5 Two independent control room emergency air cleanup systems shall be OPERABLE.

APPLICABILITY: ALL MODES or during movement of irradiated fuel assemblies.

ACTION: Each Unit shall enter applicable ACTIONS separately

Unit 2 or 3 in MODES 1, 2, 3 or 4:

With one control room emergency air cleanup 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.

Units 2 or 3 in MODES 5 or 6; or defueled when moving irradiated fuel assemblies.

a. With one control room emergency air cleanup system inoperable, restore the inoperable system to OPERABLE status within 7 days or initiate and maintain operation of the remaining OPERABLE control room emergency air cleanup system in the recirculation mode.

b. With both control room emergency air cleanup systems inoperable, or with the OPERABLE control room emergency air cleanup system required to be in the recirculation mode by ACTION (a), not capable of being powered by an OPERABLE emergency power source, suspend all operations involving CORE ALTERATIONS or positive reactivity changes, or movement of irradiated fuel assemblies.

c. The provisions of Specification 3.0.3 are not applicable in MODE 6.

d. The provisions of Specification 3.0.4 are not applicable when entering MODES 5, 6, or defueled configuration.

SURVEILLANCE REQUIREMENTS

4.7.5 Each control room emergency air cleanup system shall be demonstrated OPERABLE:

a. At least once per 12 hours by verifying that the control room air temperature is less than or equal to 110°F.

b. 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 system operates for at least 2 ~~10~~ hours (with the heaters on)

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:

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~~1.~~ Verifying that with the system operating at a flow rate of 35485 cfm ± 10% for the air conditioning unit, and 2050 ± 150 cfm for the ventilation unit and recirculating through the respective HEPA filters and charcoal adsorbers, leakage through the system diverting valves is less than or equal to 1% air conditioning unit and 1% ventilation unit when the system is tested by admitting cold DOP at the respective intake.

*Shared system with San Onofre - Unit 2.

SURVEILLANCE REQUIREMENTS (Continued)

2. Verifying that the cleanup system 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 2050 ± 150 cfm for the ventilation unit and ~~35,485~~ 35,705 cfm ± 10% for the air conditioning unit.

3. 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.

4. Verifying a system flow rate of 2050 ± 150 cfm for the ventilation unit and ~~35,485~~ 35,705 cfm ± 10% for the air conditioning unit during system operation when tested in accordance with ANSI N510-1975.

d. 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.

e. 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 7.0 inches Water Gauge ventilation unit and less than 7.3 inches Water Gauge air conditioning unit while operating the system at a flow rate of 2050 ± 150 cfm for the ventilation unit and ~~35,485~~ 35,705 cfm ± 10% for the air conditioning unit.

2. Verifying that on a control room isolation test signal, the system automatically switches into the emergency mode of operation with flow through the HEPA filters and charcoal adsorber banks.

3. Verifying that on a toxic gas isolation test signal, the system automatically switches into the isolation mode of operation with flow through the HEPA filters and charcoal adsorber banks.

4. Verifying that the system maintains the control room at a positive pressure of greater than or equal to 1/8 inch W.G. relative to the outside atmosphere during system operation in the emergency mode.

5. Verifying that the heaters dissipate 4.8 kw ± 5% when tested in accordance with ANSI N510-1975.

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FEB 18 1983

SURVEILLANCE REQUIREMENTS (Continued)

f. After each complete or partial replacement of a HEPA filter bank by verifying that the HEPA filter banks remove greater than or equal to 99.95% of the DOP when they are tested in-place in accordance with ANSI N510-1975 while operating the system at a flow rate of 2050 ± 150 cfm for the ventilation unit and 35,485 cfm ± 10% for the air conditioning unit. 9 35,705 | S1

g. After each complete or partial replacement of a charcoal adsorber bank by verifying that the charcoal adsorbers remove greater than or equal to 99.95% 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 2050 ± 150 cfm for the ventilation unit and 35,485 cfm ± 10% for the air conditioning unit. 9 35,705 | S2

FEB 1 8 1983

3/4.7.5 CONTROL ROOM EMERGENCY AIR CLEANUP SYSTEM

The CREACUS provides a protected environment from which operators can control the plant following an uncontrolled release of radioactivity, or toxic gas.

The CREACUS consists of two independent, redundant trains that recirculate and filter the control room air. Each train consists of a prefilter, a high efficiency particulate air (HEPA) filter, an activated charcoal adsorber section for removal of gaseous activity (principally iodine), and a fan. A second bank of HEPA filter follows the adsorber section (for emergency air conditioning unit only) and is used to retain carbon fines downstream of carbon adsorber. Each emergency ventilation air supply unit includes prefilter, HEPA filter, charcoal adsorber, and fan. Ductwork, motor-operated dampers, and instrumentation also form part of the system. Air and motor-operated dampers are provided for air volume control and system isolation purposes.

Upon receipt of the actuating signal, normal air supply to the control room is isolated, and the stream of ventilation air is recirculated through the system's filter trains. The prefilters remove any large particles in the air to prevent excessive loading of the HEPA filters and charcoal adsorbers. Continuous operation of each train for at least 15 minutes per month verifies proper system operation.

There are two CREACUS operational modes. Emergency mode is an operational mode when the control room is isolated to prevent operation personnel from the radioactive exposure through the duration of any one of the postulated limiting faults discussed in FSAR, Chapter I5. Isolation mode is an operational mode when control room is isolated to protect operation personnel from toxic gases and smoke.

Actuation of the CREACUS places the system into either of two separate states of the operation, depending on the initiation signal. Actuation of the system to the emergency mode of operation closes the unfiltered-outside-air intake and exhaust dampers and aligns the system for recirculation of control room air through the redundant trains of HEPA and charcoal filters. The emergency mode initiates pressurization of the control room. Outside air is added to the air being recirculated from the control room.

Pressurization of the control room prevents infiltration of infiltered air from the surrounding areas of the building.

The actions taken in the toxic gas isolation mode are the same, except that the signal switches control room ventilation to an isolation mode, preventing outside air from entering the control room.

BASES

3/4.7.5 CONTROL ROOM EMERGENCY AIR CLEANUP SYSTEM (continued)

The control room supply and the outside air supply of the normal control room HVAC is monitored by radiation and toxic-gas detectors respectively. One detector output above the setpoint will cause actuation of the emergency mode or isolation mode as required. The actions of the toxic gas isolation mode are more restrictive, and will override the actions of the emergency radiation mode. However, toxic gas and radiation events are not considered to occur concurrently.

A single train will pressurize the control room to at least 0.125 inches water gauge, and provides an air exchange rate in excess of 45% per hour.

Redundant recirculation trains provide the required filtration should an excessive pressure drop develop across the other filter train. Normally open isolation dampers are arranged in series pairs so that the failure of one damper to shut will not result in a breach of isolation. The CREACUS is designed in accordance with Seismic Category 1 requirements.

The CREACUS is designed to maintain the control room environment for 30 days of continuous occupancy after a Design Basis Accident (DBA) without exceeding a 5 rem whole body dose.

Cumulative operation of the system for at least 2 hours ever a 31 day period is sufficient to reduce the buildup of moisture on the adsorbers and HEPA filters. 2 hours time frame is based on conservative engineering evaluation which calculated the time required to evaporate the moisture contained in the air trapped inside the CREACUS duct upstream of charcoal beds. SI

ATTACHMENT "E"

Proposed Under Technical Specifications Improvement Program (TSIP) Specifications (not changed per PCN-407)
UNIT 2

3.7 PLANT SYSTEMS

3.7.11 Control Room Emergency Air Cleanup System (CREACUS)

LCO 3.7.11 Two CREACUS trains shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, 4, 5, and 6,
During movement of irradiated fuel assemblies.

ACTIONS

----------NOTE----------
The provisions of LCO 3.0.4 are not applicable when entering MODES 5, 6, or defueled configuration.

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One CREACUS train inoperable.	A.1	Restore CREACUS train to OPERABLE status.	7 days
B. Required Action and associated Completion Time of Condition A not met in MODE 1, 2, 3, or 4.	B.1 AND B.2	Be in MODE 3. Be in MODE 5.	6 hours 36 hours
C. Required Action and associated Completion Time of Condition A not met in MODES 5 or 6, or during movement of irradiated fuel assemblies.	C.1 OR	Place OPERABLE CREACUS train in emergency radiation protection mode.	Immediately (continued)

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
C. (continued)	C.2.1	Suspend CORE ALTERATIONS.	Immediately
	AND		
	C.2.2	Suspend movement of irradiated fuel assemblies.	Immediately
D. Two CREACUS trains inoperable in MODE 1, 2, 3, or 4.	D.1	Enter LCO 3.0.3.	Immediately
E. Two CREACUS trains inoperable in MODES 5 or 6, or during movement of irradiated fuel assemblies.	E.1	Suspend CORE ALTERATIONS.	Immediately
	AND		
	E.2	Suspend movement of irradiated fuel assemblies.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.11.1	Operate each CREACUS train for ≥ 10 hours with the heaters on.	31 days
SR 3.7.11.2	Perform required CREACUS filter testing in accordance with Ventilation Filter Testing Program (VFTP).	In accordance with the VFTP

(continued)

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.7.11.3	Verify that with the system operating at a flow rate of 35485 cfm ±10% for the air conditioning unit, and 2050 ±150 cfm for the ventilation unit and recirculating through the respective HEPA filters and charcoal adsorbers, leakage through the system diverting valves is less than or equal to 1% air conditioning unit and 1% ventilation unit when the system is tested by admitting cold DOP at the respective intake.	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
SR 3.7.11.4	Verify that the heaters dissipate 4.8 kw ± 5% when tested in accordance with ANSI N510-1975.	18 months
SR 3.7.11.5	Verify each CREACUS train actuates on an actual or simulated actuation signal.	24 months
SR 3.7.11.6	Verify each CREACUS train can maintain a positive pressure of ≥ 0.125 inches water gauge, relative to the atmosphere during the emergency radiation state of the emergency mode of operation.	24 months

B 3.7 PLANT SYSTEMS

B 3.7.11 Control Room Emergency Air Cleanup System (CREACUS)

BASES

BACKGROUND

The CREACUS provides a protected environment from which operators can control the plant following an uncontrolled release of radioactivity.

The CREACUS consists of two independent, redundant trains that recirculate and filter the control room air. Each CREACUS train consists of emergency air conditioning unit, emergency ventilation air supply unit, emergency isolation dampers, and cooling coils and two cabinet coolers per Unit. Each emergency air conditioning unit includes a prefilter, a high efficiency particulate air (HEPA) filter, an activated carbon adsorber section for removal of gaseous activity (principally iodine), and a fan. A second bank of HEPA filters follows the adsorber section to collect carbon fines. Each emergency ventilation air supply unit includes prefilter, HEPA filter, carbon adsorber and fan. Ductwork, motor-operated dampers, and instrumentation also form part of the system. Air and motor-operated dampers are provided for air volume control and system isolation purposes.

Upon receipt of the actuating signal, normal air supply to the control room is isolated, and the stream of ventilation air is recirculated through the system's filter trains. The prefilters remove any large particles in the air to prevent excessive loading of the HEPA filters and charcoal adsorbers. Continuous operation of each train for at least 15 minutes per month verifies proper system operability.

There are two CREACUS operational modes. Emergency mode is an operational mode when the control room is isolated to protect operational personnel from radioactive exposure through the duration of any one of the postulated limiting faults discussed in Chapter 15 UFSAR (Ref. 2). Isolation mode is an operational mode when the control room is isolated to protect operational personnel from toxic gasses and smoke.

Actuation of the CREACUS places the system into either of two separate states of operation, depending on the initiation signal. Actuation of the system to the emergency mode of operation closes the unfiltered-outside-air intake

(continued)

BASES

BACKGROUND (continued)

and unfiltered exhaust dampers, and aligns the system for recirculation of control room air through the redundant trains of HEPA and charcoal filters. The emergency mode initiates pressurization of the control room.

Outside air is added to the air being recirculated from the control room. Pressurization of the control room prevents infiltration of unfiltered air from the surrounding areas of the building.

The control room supply and the outside air supply of the normal control room HVAC are monitored by radiation and toxic-gas detectors respectively. One detector output above the setpoint will cause actuation of the emergency mode or isolation mode as required. The actions of the isolation mode are more restrictive, and will override the actions of the emergency mode of operation. However, toxic gas and radiation events are not considered to occur concurrently.

A single train will pressurize the control room to at least 0.125 inches water gauge, and provides an air exchange rate in excess of 45% per hour. The CREACUS operation in maintaining the control room habitable is discussed in Reference 1.

Redundant recirculation trains provide the required filtration should an excessive pressure drop develop across the other filter train. Normally-open isolation dampers are arranged in series pairs so that one damper's failure to shut will not result in a breach of isolation. The CREACUS is designed in accordance with Seismic Category I requirements.

The CREACUS is designed to maintain the control room environment for 30 days of continuous occupancy after a Design Basis Accident (DBA) without exceeding a 5-rem whole-body dose.

APPLICABLE SAFETY ANALYSES

The CREACUS components are arranged in redundant safety related ventilation trains. The location of components and ducting within the control room envelope ensures an adequate supply of filtered air to all areas requiring access.

(continued)

BASES

APPLICABLE SAFETY ANALYSES (continued)

The CREACUS provides airborne radiological protection for the control room operators, as demonstrated by the control room accident dose analyses for the most limiting design basis loss of coolant accident fission product release presented in the UFSAR, Chapter 15 (Ref. 2).

The analysis of toxic gas releases demonstrates that the toxicity limits are not exceeded in the control room following a toxic chemical release, as presented in Reference 1.

The worst case single active failure of a component of the CREACUS, assuming a loss of offsite power, does not impair the ability of the system to perform its design function.

The CREACUS satisfies Criterion 3 of the NRC Policy Statement.

LCO

Two independent and redundant trains of the CREACUS are required to be OPERABLE to ensure that at least one is available, assuming that a single failure disables the other train. Total system failure could result in a control room operator receiving a dose in excess of 5 rem in the event of a large radioactive release.

The CREACUS is considered OPERABLE when the individual components necessary to control operator exposure are OPERABLE in both trains. A CREACUS train is considered OPERABLE when the associated:

a. Fan is OPERABLE;

b. HEPA filters and charcoal adsorber are not excessively restricting flow, and are capable of performing their filtration functions; and

c. Ductwork, valves, and dampers are OPERABLE, and air circulation can be maintained.

In addition, the control room boundary must be maintained, or administratively controlled, including the integrity of the walls, floors, ceilings, ductwork, and access doors.

(continued)

BASES

APPLICABILITY

In MODES 1, 2, 3, and 4, the CREACUS must be OPERABLE to limit operator exposure during and following a DBA.

In MODES 5 and 6, the CREACUS is required to cope with the release from a rupture of a waste gas tank.

During movement of irradiated fuel assemblies, the CREACUS must be OPERABLE to cope with the release from a fuel handling accident.

ACTIONS

ACTION statements are modified by NOTE "The provisions of LCO 3.0.4 are not applicable when entering MODES 5, 6, or defueled configuration." Therefore, since CREACUS can be inoperable during each individual MODE, it should not be required to have two OPERABLE CREACUS trains before MODE change from defueled from MODE 6 to defueled configuration, and from MODE 4 to MODE 5.

Specification 3.0.4 establishes that entry into an operational mode or other specified condition shall not be made unless the conditions of the LCO are met. Applicability statement "During movement of irradiated fuel assemblies" ensures the OPERABILITY of both CREACUS trains prior to the start of movement of irradiated fuel assemblies.

A.1

With one CREACUS train inoperable, action must be taken to restore OPERABLE status within 7 days. In this Condition, the remaining OPERABLE CREACUS subsystem is adequate to perform control room radiation protection function. However, the overall reliability is reduced because a single failure in the OPERABLE CREACUS train could result in loss of CREACUS function. The 7 day Completion Time is based on the low probability of a DBA occurring during this time period, and the ability of the remaining train to provide the required capability.

BASES

ACTIONS (continued)

B.1 and B.2

If the inoperable CREACUS cannot be restored to OPERABLE status within the required Completion Time in MODE 1, 2, 3, or 4, the unit must be placed in a MODE that minimizes the accident risk. To achieve this status, the unit must be placed in at least MODE 3 within 6 hours, and in MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

C.1, C.2.1, and C.2.2

In MODE 5 or 6, or during movement of irradiated fuel assemblies, if Required Action A.1 cannot be completed within the required Completion Time, the OPERABLE CREACUS train must be immediately placed in the emergency mode of operation. This action ensures that the remaining train is OPERABLE, that no failures preventing automatic actuation will occur, and that any active failure will be readily detected.

An alternative to Required Action C.1 is to immediately suspend activities that could result in a release of radioactivity that might require isolation of the control room. This places the unit in a condition that minimizes the accident risk. This does not preclude the movement of fuel assemblies to a safe position.

D.1

If both CREACUS trains are inoperable in MODE 1, 2, 3, or 4, the CREACUS may not be capable of performing the intended function and the unit is in a condition outside the accident analyses. Therefore, LCO 3.0.3 must be entered immediately.

E.1 and E.2

When in MODES 5 or 6, or during movement of irradiated fuel assemblies with two trains inoperable, action must be taken immediately to suspend activities that could result in a release of radioactivity that might enter the control room.

BASES

ACTIONS (continued)

This places the unit in a condition that minimizes the accident risk. This does not preclude the movement of fuel to a safe position.

SURVEILLANCE REQUIREMENTS

SR 3.7.11.1

Standby systems should be checked periodically to ensure that they function properly. Since the environment and normal operating conditions on this system are not severe, testing each train once every month provides an adequate check on this system.

Systems with heaters must be operated for ≥ 10 continuous hours with the heaters energized. This is sufficient to reduce the buildup of mositure on the adsorbers and HEPA filters. The 31 day Frequency is based on the known reliability of the equipment, and the two train redundancy available.

SR 3.7.11.2

This SR verifies that the required CREACUS testing is performed in accordance with the Ventilation Filter Testing Program (VFTP). The CREACUS filter tests are based on Regulatory Guide 1.52 (Ref. 3). The VFTP includes testing HEPA filter performance, charcoal adsorber efficiency, minimum system flow rate, and the physical properties of the activated charcoal (general use and following specific operations). Specific test frequencies and additional information are discussed in detail in the VFTP.

SR 3.7.11.3

This SR verifies that with the system operating at a flow rate of 35485 cfm ±10% for the air conditioning unit, and 2050 ±150 cfm for the ventilation unit and recirculating through the respective HEPA filters and charcoal adsorbers, leakage through the system diverting valves is less than or equal to 1% air conditioning unit and 1% ventilation unit when the system is tested by admitting cold DOP at the respective intake. The frequency of this

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.7.11.3 (continued)

SR is 18 month 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.

SR 3.7.11.4

This SR verifies that the heaters dissipate 4.8 kw ± 5% when tested in accordance with ANSI N510-1975. The frequency of this SR is 18 months.

SR 3.7.11.5

This SR verifies each CREACUS train starts and operates on an actual or simulated actuation signal. The Frequency of 24 months is consistent with that specified in Reference 3.

SR 3.7.11.6

This SR verifies the integrity of the control room enclosure and the assumed inleakage rates of potentially contaminated air. The control room positive pressure, with respect to potentially contaminated atmosphere, is periodically tested to verify proper function of the CREACUS. During the emergency radiation state of the emergency mode of operation, the CREACUS is designed to pressurize the control room ≥ 0.125 inches water gauge positive pressure with respect to the atmosphere in order to prevent unfiltered inleakage. The CREACUS is designed to maintain this positive pressure with one train.

REFERENCES

1. UFSAR, Section 9.4.
2. UFSAR, Chapter 15.
3. Regulatory Guide 1.52 (Rev. 2).

ATTACHMENT "F"

Proposed Under Technical Specifications Improvement Program (TSIP) Specifications (not changed per PCN-407)
UNIT 3

3.7 PLANT SYSTEMS

3.7.11 Control Room Emergency Air Cleanup System (CREACUS)

LCO 3.7.11 Two CREACUS trains shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, 4, 5, and 6,
During movement of irradiated fuel assemblies.

ACTIONS

----------NOTE----------
The provisions of LCO 3.0.4 are not applicable when entering MODES 5, 6, or defueled configuration.

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One CREACUS train inoperable.	A.1	Restore CREACUS train to OPERABLE status.	7 days
B. Required Action and associated Completion Time of Condition A not met in MODE 1, 2, 3, or 4.	B.1 AND B.2	Be in MODE 3. Be in MODE 5.	6 hours 36 hours
C. Required Action and associated Completion Time of Condition A not met in MODES 5 or 6, or during movement of irradiated fuel assemblies.	C.1 OR	Place OPERABLE CREACUS train in emergency radiation protection mode.	Immediately

(continued)

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
C. (continued)	C.2.1	Suspend CORE ALTERATIONS.	Immediately
	AND		
	C.2.2	Suspend movement of irradiated fuel assemblies.	Immediately
D. Two CREACUS trains inoperable in MODE 1, 2, 3, or 4.	D.1	Enter LCO 3.0.3.	Immediately
E. Two CREACUS trains inoperable in MODES 5 or 6, or during movement of irradiated fuel assemblies.	E.1	Suspend CORE ALTERATIONS.	Immediately
	AND		
	E.2	Suspend movement of irradiated fuel assemblies.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.11.1	Operate each CREACUS train for ≥ 10 hours with the heaters on.	31 days
SR 3.7.11.2	Perform required CREACUS filter testing in accordance with Ventilation Filter Testing Program (VFTP).	In accordance with the VFTP

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.7.11.3	Verify that with the system operating at a flow rate of 35485 cfm ±10% for the air conditioning unit, and 2050 ±150 cfm for the ventilation unit and recirculating through the respective HEPA filters and charcoal adsorbers, leakage through the system diverting valves is less than or equal to 1% air conditioning unit and 1% ventilation unit when the system is tested by admitting cold DOP at the respective intake.	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
SR 3.7.11.4	Verify that the heaters dissipate 4.8 kw ± 5% when tested in accordance with ANSI N510-1975.	18 months
SR 3.7.11.5	Verify each CREACUS train actuates on an actual or simulated actuation signal.	24 months
SR 3.7.11.6	Verify each CREACUS train can maintain a positive pressure of ≥ 0.125 inches water gauge, relative to the atmosphere during the emergency radiation state of the emergency mode of operation.	24 months

B 3.7 PLANT SYSTEMS

B 3.7.11 Control Room Emergency Air Cleanup System (CREACUS)

BASES

BACKGROUND

The CREACUS provides a protected environment from which operators can control the plant following an uncontrolled release of radioactivity.

The CREACUS consists of two independent, redundant trains that recirculate and filter the control room air. Each CREACUS train consists of emergency air conditioning unit, emergency ventilation air supply unit, emergency isolation dampers, and cooling coils and two cabinet coolers per Unit. Each emergency air conditioning unit includes a prefilter, a high efficiency particulate air (HEPA) filter, an activated carbon adsorber section for removal of gaseous activity (principally iodine), and a fan. A second bank of HEPA filters follows the adsorber section to collect carbon fines. Each emergency ventilation air supply unit includes prefilter, HEPA filter, carbon adsorber and fan. Ductwork, motor-operated dampers, and instrumentation also form part of the system. Air and motor-operated dampers are provided for air volume control and system isolation purposes.

Upon receipt of the actuating signal, normal air supply to the control room is isolated, and the stream of ventilation air is recirculated through the system's filter trains. The prefilters remove any large particles in the air to prevent excessive loading of the HEPA filters and charcoal adsorbers. Continuous operation of each train for at least 15 minutes per month verifies proper system operability.

There are two CREACUS operational modes. Emergency mode is an operational mode when the control room is isolated to protect operational personnel from radioactive exposure through the duration of any one of the postulated limiting faults discussed in Chapter 15 UFSAR (Ref. 2). Isolation mode is an operational mode when the control room is isolated to protect operational personnel from toxic gasses and smoke.

Actuation of the CREACUS places the system into either of two separate states of operation, depending on the initiation signal. Actuation of the system to the emergency mode of operation closes the unfiltered-outside-air intake

(continued)

BASES

BACKGROUND (continued)

and unfiltered exhaust dampers, and aligns the system for recirculation of control room air through the redundant trains of HEPA and charcoal filters. The emergency mode initiates pressurization of the control room.

Outside air is added to the air being recirculated from the control room. Pressurization of the control room prevents infiltration of unfiltered air from the surrounding areas of the building.

The control room supply and the outside air supply of the normal control room HVAC are monitored by radiation and toxic-gas detectors respectively. One detector output above the setpoint will cause actuation of the emergency mode or isolation mode as required. The actions of the isolation mode are more restrictive, and will override the actions of the emergency mode of operation. However, toxic gas and radiation events are not considered to occur concurrently.

A single train will pressurize the control room to at least 0.125 inches water gauge, and provides an air exchange rate in excess of 45% per hour. The CREACUS operation in maintaining the control room habitable is discussed in Reference 1.

Redundant recirculation trains provide the required filtration should an excessive pressure drop develop across the other filter train. Normally-open isolation dampers are arranged in series pairs so that one damper's failure to shut will not result in a breach of isolation. The CREACUS is designed in accordance with Seismic Category I requirements.

The CREACUS is designed to maintain the control room environment for 30 days of continuous occupancy after a Design Basis Accident (DBA) without exceeding a 5-rem whole-body dose.

APPLICABLE SAFETY ANALYSES

The CREACUS components are arranged in redundant safety related ventilation trains. The location of components and ducting within the control room envelope ensures an adequate supply of filtered air to all areas requiring access.

(continued)

BASES

APPLICABLE SAFETY ANALYSES (continued)

The CREACUS provides airborne radiological protection for the control room operators, as demonstrated by the control room accident dose analyses for the most limiting design basis loss of coolant accident fission product release presented in the UFSAR, Chapter 15 (Ref. 2).

The analysis of toxic gas releases demonstrates that the toxicity limits are not exceeded in the control room following a toxic chemical release, as presented in Reference 1.

The worst case single active failure of a component of the CREACUS, assuming a loss of offsite power, does not impair the ability of the system to perform its design function.

The CREACUS satisfies Criterion 3 of the NRC Policy Statement.

LCO

Two independent and redundant trains of the CREACUS are required to be OPERABLE to ensure that at least one is available, assuming that a single failure disables the other train. Total system failure could result in a control room operator receiving a dose in excess of 5 rem in the event of a large radioactive release.

The CREACUS is considered OPERABLE when the individual components necessary to control operator exposure are OPERABLE in both trains. A CREACUS train is considered OPERABLE when the associated:

a. Fan is OPERABLE;

b. HEPA filters and charcoal adsorber are not excessively restricting flow, and are capable of performing their filtration functions; and

c. Ductwork, valves, and dampers are OPERABLE, and air circulation can be maintained.

In addition, the control room boundary must be maintained, or administratively controlled, including the integrity of the walls, floors, ceilings, ductwork, and access doors.

(continued)

BASES

APPLICABILITY

In MODES 1, 2, 3, and 4, the CREACUS must be OPERABLE to limit operator exposure during and following a DBA.

In MODES 5 and 6, the CREACUS is required to cope with the release from a rupture of a waste gas tank.

During movement of irradiated fuel assemblies, the CREACUS must be OPERABLE to cope with the release from a fuel handling accident.

ACTIONS

ACTION statements are modified by NOTE "The provisions of LCO 3.0.4 are not applicable when entering MODES 5, 6, or defueled configuration." Therefore, since CREACUS can be inoperable during each individual MODE, it should not be required to have two OPERABLE CREACUS trains before MODE change from defueled from MODE 6 to defueled configuration, and from MODE 4 to MODE 5.

Specification 3.0.4 establishes that entry into an operational mode or other specified condition shall not be made unless the conditions of the LCO are met. Applicability statement "During movement of irradiated fuel assemblies" ensures the OPERABILITY of both CREACUS trains prior to the start of movement of irradiated fuel assemblies.

A.1

With one CREACUS train inoperable, action must be taken to restore OPERABLE status within 7 days. In this Condition, the remaining OPERABLE CREACUS subsystem is adequate to perform control room radiation protection function. However, the overall reliability is reduced because a single failure in the OPERABLE CREACUS train could result in loss of CREACUS function. The 7 day Completion Time is based on the low probability of a DBA occurring during this time period, and the ability of the remaining train to provide the required capability.

(continued)

BASES

ACTIONS (continued)

B.1 and B.2

If the inoperable CREACUS cannot be restored to OPERABLE status within the required Completion Time in MODE 1, 2, 3, or 4, the unit must be placed in a MODE that minimizes the accident risk. To achieve this status, the unit must be placed in at least MODE 3 within 6 hours, and in MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

C.1, C.2.1, and C.2.2

In MODE 5 or 6, or during movement of irradiated fuel assemblies, if Required Action A.1 cannot be completed within the required Completion Time, the OPERABLE CREACUS train must be immediately placed in the emergency mode of operation. This action ensures that the remaining train is OPERABLE, that no failures preventing automatic actuation will occur, and that any active failure will be readily detected.

An alternative to Required Action C.1 is to immediately suspend activities that could result in a release of radioactivity that might require isolation of the control room. This places the unit in a condition that minimizes the accident risk. This does not preclude the movement of fuel assemblies to a safe position.

D.1

If both CREACUS trains are inoperable in MODE 1, 2, 3, or 4, the CREACUS may not be capable of performing the intended function and the unit is in a condition outside the accident analyses. Therefore, LCO 3.0.3 must be entered immediately.

E.1 and E.2

When in MODES 5 or 6, or during movement of irradiated fuel assemblies with two trains inoperable, action must be taken immediately to suspend activities that could result in a release of radioactivity that might enter the control room.

(continued)

BASES

ACTIONS (continued)

This places the unit in a condition that minimizes the accident risk. This does not preclude the movement of fuel to a safe position.

SURVEILLANCE REQUIREMENTS

SR 3.7.11.1

Standby systems should be checked periodically to ensure that they function properly. Since the environment and normal operating conditions on this system are not severe, testing each train once every month provides an adequate check on this system.

Systems with heaters must be operated for ≥ 10 continuous hours with the heaters energized. This is sufficient to reduce the buildup of mositure on the adsorbers and HEPA filters. The 31 day Frequency is based on the known reliability of the equipment, and the two train redundancy available.

SR 3.7.11.2

This SR verifies that the required CREACUS testing is performed in accordance with the Ventilation Filter Testing Program (VFTP). The CREACUS filter tests are based on Regulatory Guide 1.52 (Ref. 3). The VFTP includes testing HEPA filter performance, charcoal adsorber efficiency, minimum system flow rate, and the physical properties of the activated charcoal (general use and following specific operations). Specific test frequencies and additional information are discussed in detail in the VFTP.

SR 3.7.11.3

This SR verifies that with the system operating at a flow rate of 35485 cfm ±10% for the air conditioning unit, and 2050 ±150 cfm for the ventilation unit and recirculating through the respective HEPA filters and charcoal adsorbers,leakage through the system diverting valves is less than or equal to 1% air conditioning unit and 1% ventilation unit when the system is tested by admitting cold DOP at the respective intake. The frequency of this

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.7.11.3 (continued)

SR is 18 month 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.

SR 3.7.11.4

This SR verifies that the heaters dissipate 4.8 kw ± 5% when tested in accordance with ANSI N510-1975. The frequency of this SR is 18 months.

SR 3.7.11.5

This SR verifies each CREACUS train starts and operates on an actual or simulated actuation signal. The Frequency of 24 months is consistent with that specified in Reference 3.

SR 3.7.11.6

This SR verifies the integrity of the control room enclosure and the assumed inleakage rates of potentially contaminated air. The control room positive pressure, with respect to potentially contaminated atmosphere, is periodically tested to verify proper function of the CREACUS. During the emergency radiation state of the emergency mode of operation, the CREACUS is designed to pressurize the control room ≥ 0.125 inches water gauge positive pressure with respect to the atmosphere in order to prevent unfiltered inleakage. The CREACUS is designed to maintain this positive pressure with one train.

REFERENCES

1. UFSAR, Section 9.4.

2. UFSAR, Chapter 15.

3. Regulatory Guide 1.52 (Rev. 2).

ATTACHMENT "G"

Proposed Under Technical Specifications Improvement Program (TSIP) Specifications (changed per PCN-407)
UNIT 2

3.7 PLANT SYSTEMS

3.7.11 Control Room Emergency Air Cleanup System (CREACUS)

LCO 3.7.11 Two CREACUS trains shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, 4, 5, and 6,
During movement of irradiated fuel assemblies.

ACTIONS

----------NOTES----------

1. The provisions of LCO 3.0.4 are not applicable when entering MODES 5, 6, or defueled configuration.
2. ---

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One CREACUS train inoperable.	A.1	Restore CREACUS train to OPERABLE status.	7 days
B. Required Action and associated Completion Time of Condition A not met in MODE 1, 2, 3, or 4.	B.1 AND B.2	Be in MODE 3. Be in MODE 5.	6 hours 36 hours
C. Required Action and associated Completion Time of Condition A not met in MODES 5 or 6, or during movement of irradiated fuel assemblies.	C.1 OR	Place OPERABLE CREACUS train in emergency radiation protection mode.	Immediately

(continued)

Each Unit shall enter applicable ACTIONS separately.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
C. (continued)	C.2.1	Suspend CORE ALTERATIONS.	Immediately
	AND		
	C.2.2	Suspend movement of irradiated fuel assemblies.	Immediately
D. Two CREACUS trains inoperable in MODE 1, 2, 3, or 4.	D.1	Enter LCO 3.0.3.	Immediately
E. Two CREACUS trains inoperable in MODES 5 or 6, or during movement of irradiated fuel assemblies.	E.1	Suspend CORE ALTERATIONS.	Immediately
	AND		
	E.2	Suspend movement of irradiated fuel assemblies.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.11.1	Operate each CREACUS train for ≥ 10 hours ~~with the heaters on~~.	31 days
SR 3.7.11.2	Perform required CREACUS filter testing in accordance with Ventilation Filter Testing Program (VFTP).	In accordance with the VFTP

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.7.11.3	Verify that with the system operating at a flow rate of 35485 cfm ±10% for the air conditioning unit, and 2050 ±150 cfm for the ventilation unit and recirculating through the respective HEPA filters and charcoal adsorbers, leakage through the system diverting valves is less than or equal to 1% air conditioning unit and 1% ventilation unit when the system is tested by admitting cold DOP at the respective intake.	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
SR 3.7.11.4	Verify that the heaters dissipate 4.8 kw ± 5% when tested in accordance with ANSI N510-1975.	18 months
SR 3.7.11.3	Verify each CREACUS train actuates on an actual or simulated actuation signal.	24 months
SR 3.7.11.4	Verify each CREACUS train can maintain a positive pressure of ≥ 0.125 inches water gauge, relative to the atmosphere during the emergency radiation state of the emergency mode of operation.	24 months

B 3.7 PLANT SYSTEMS

B 3.7.11 Control Room Emergency Air Cleanup System (CREACUS)

BASES

BACKGROUND

The CREACUS provides a protected environment from which operators can control the plant following an uncontrolled release of radioactivity.

The CREACUS consists of two independent, redundant trains that recirculate and filter the control room air. Each CREACUS train consists of emergency air conditioning unit, emergency ventilation air supply unit, emergency isolation dampers, and cooling coils and two cabinet coolers per Unit. Each emergency air conditioning unit includes a prefilter, a high efficiency particulate air (HEPA) filter, an activated carbon adsorber section for removal of gaseous activity (principally iodine), and a fan. A second bank of HEPA filters follows the adsorber section to collect carbon fines. Each emergency ventilation air supply unit includes prefilter, HEPA filter, carbon adsorber and fan. Ductwork, motor-operated dampers, and instrumentation also form part of the system. Air and motor-operated dampers are provided for air volume control and system isolation purposes.

Upon receipt of the actuating signal, normal air supply to the control room is isolated, and the stream of ventilation air is recirculated through the system's filter trains. The prefilters remove any large particles in the air to prevent excessive loading of the HEPA filters and charcoal adsorbers. Continuous operation of each train for at least 15 minutes per month verifies proper system operability.

There are two CREACUS operational modes. Emergency mode is an operational mode when the control room is isolated to protect operational personnel from radioactive exposure through the duration of any one of the postulated limiting faults discussed in Chapter 15 UFSAR (Ref. 2). Isolation mode is an operational mode when the control room is isolated to protect operational personnel from toxic gasses and smoke.

Actuation of the CREACUS places the system into either of two separate states of operation, depending on the initiation signal. Actuation of the system to the emergency mode of operation closes the unfiltered-outside-air intake

(continued)

BASES

BACKGROUND (continued)

and unfiltered exhaust dampers, and aligns the system for recirculation of control room air through the redundant trains of HEPA and charcoal filters. The emergency mode initiates pressurization of the control room.

Outside air is added to the air being recirculated from the control room. Pressurization of the control room prevents infiltration of unfiltered air from the surrounding areas of the building.

The control room supply and the outside air supply of the normal control room HVAC are monitored by radiation and toxic-gas detectors respectively. One detector output above the setpoint will cause actuation of the emergency mode or isolation mode as required. The actions of the isolation mode are more restrictive, and will override the actions of the emergency mode of operation. However, toxic gas and radiation events are not considered to occur concurrently.

A single train will pressurize the control room to at least 0.125 inches water gauge, and provides an air exchange rate in excess of 45% per hour. The CREACUS operation in maintaining the control room habitable is discussed in Reference 1.

Redundant recirculation trains provide the required filtration should an excessive pressure drop develop across the other filter train. Normally-open isolation dampers are arranged in series pairs so that one damper's failure to shut will not result in a breach of isolation. The CREACUS is designed in accordance with Seismic Category I requirements.

The CREACUS is designed to maintain the control room environment for 30 days of continuous occupancy after a Design Basis Accident (DBA) without exceeding a 5-rem whole body dose.

APPLICABLE SAFETY ANALYSES

The CREACUS components are arranged in redundant safety related ventilation trains. The location of components and ducting within the control room envelope ensures an adequate supply of filtered air to all areas requiring access.

(continued)

BASES

APPLICABLE SAFETY ANALYSES (continued)

The CREACUS provides airborne radiological protection for the control room operators, as demonstrated by the control room accident dose analyses for the most limiting design basis loss of coolant accident fission product release presented in the UFSAR, Chapter 15 (Ref. 2).

The analysis of toxic gas releases demonstrates that the toxicity limits are not exceeded in the control room following a toxic chemical release, as presented in Reference 1.

The worst case single active failure of a component of the CREACUS, assuming a loss of offsite power, does not impair the ability of the system to perform its design function.

The CREACUS satisfies Criterion 3 of the NRC Policy Statement.

LCO

Two independent and redundant trains of the CREACUS are required to be OPERABLE to ensure that at least one is available, assuming that a single failure disables the other train. Total system failure could result in a control room operator receiving a dose in excess of 5 rem in the event of a large radioactive release.

The CREACUS is considered OPERABLE when the individual components necessary to control operator exposure are OPERABLE in both trains. A CREACUS train is considered OPERABLE when the associated:

a. Fan is OPERABLE;

b. HEPA filters and charcoal adsorber are not excessively restricting flow, and are capable of performing their filtration functions; and

c. Ductwork, valves, and dampers are OPERABLE, and air circulation can be maintained.

In addition, the control room boundary must be maintained, or administratively controlled, including the integrity of the walls, floors, ceilings, ductwork, and access doors.

(continued)

BASES

APPLICABILITY

In MODES 1, 2, 3, and 4, the CREACUS must be OPERABLE to limit operator exposure during and following a DBA.

In MODES 5 and 6, the CREACUS is required to cope with the release from a rupture of a waste gas tank.

During movement of irradiated fuel assemblies, the CREACUS must be OPERABLE to cope with the release from a fuel handling accident.

ACTIONS

ACTION statements are modified by two NOTES. NOTE 1 says: "The provisions of LCO 3.0.4 are not applicable when entering MODES 5, 6, or defueled configuration." Therefore, since CREACUS can be inoperable during each individual MODE, it should not be required to have two OPERABLE CREACUS trains before MODE change from defueled from MODE 6 to defueled configuration, and from MODE 4 to MODE 5.

Specification 3.0.4 establishes that entry into an operational mode or other specified condition shall not be made unless the conditions of the LCO are met. Applicability statement "During movement of irradiated fuel assemblies" ensures the OPERABILITY of both CREACUS trains prior to the start of movement of irradiated fuel assemblies.

A.1

With one CREACUS train inoperable, action must be taken to restore OPERABLE status within 7 days. In this Condition, the remaining OPERABLE CREACUS subsystem is adequate to perform control room radiation protection function. However, the overall reliability is reduced because a single failure in the OPERABLE CREACUS train could result in loss of CREACUS function. The 7 day Completion Time is based on the low probability of a DBA occurring during this time period, and the ability of the remaining train to provide the required capability.

NOTE 2 says: "Each Unit shall enter applicable ACTIONS separately." CREACUS is a shared system between Unit 2 and Unit 3. LCO doesn't address the operational situation when the Units are in different operational MODES. Without this NOTE it may not be clear what ACTIONS should be taken.

BASES

ACTIONS
(continued)

B.1 and B.2

If the inoperable CREACUS cannot be restored to OPERABLE status within the required Completion Time in MODE 1, 2, 3, or 4, the unit must be placed in a MODE that minimizes the accident risk. To achieve this status, the unit must be placed in at least MODE 3 within 6 hours, and in MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

C.1, C.2.1, and C.2.2

In MODE 5 or 6, or during movement of irradiated fuel assemblies, if Required Action A.1 cannot be completed within the required Completion Time, the OPERABLE CREACUS train must be immediately placed in the emergency mode of operation. This action ensures that the remaining train is OPERABLE, that no failures preventing automatic actuation will occur, and that any active failure will be readily detected.

An alternative to Required Action C.1 is to immediately suspend activities that could result in a release of radioactivity that might require isolation of the control room. This places the unit in a condition that minimizes the accident risk. This does not preclude the movement of fuel assemblies to a safe position.

D.1

If both CREACUS trains are inoperable in MODE 1, 2, 3, or 4, the CREACUS may not be capable of performing the intended function and the unit is in a condition outside the accident analyses. Therefore, LCO 3.0.3 must be entered immediately.

E.1 and E.2

When in MODES 5 or 6, or during movement of irradiated fuel assemblies with two trains inoperable, action must be taken immediately to suspend activities that could result in a release of radioactivity that might enter the control room.

BASES

ACTIONS (continued)

This places the unit in a condition that minimizes the accident risk. This does not preclude the movement of fuel to a safe position.

SURVEILLANCE REQUIREMENTS

SR 3.7.11.1

Standby systems should be checked periodically to ensure that they function properly. Since the environment and normal operating conditions on this system are not severe, testing each train once every month provides an adequate check on this system.

INSERT "A"

Systems with heaters must be operated for ≥ 10 continuous hours with the heaters energized. This is sufficient to reduce the buildup of mositure on the adsorbers and HEPA filters. The 31 day Frequency is based on the known reliability of the equipment, and the two train redundancy available.

SR 3.7.11.2

This SR verifies that the required CREACUS testing is performed in accordance with the Ventilation Filter Testing Program (VFTP). The CREACUS filter tests are based on Regulatory Guide 1.52 (Ref. 3). The VFTP includes testing HEPA filter performance, charcoal adsorber efficiency, minimum system flow rate, and the physical properties of the activated charcoal (general use and following specific operations). Specific test frequencies and additional information are discussed in detail in the VFTP.

SR 3.7.11.3

This SR verifies that with the system operating at a flow rate of 35485 cfm ±10% for the air conditioning unit, and 2050 ±150 cfm for the ventilation unit and recirculating through the respective HEPA filters and charcoal adsorbers, leakage through the system diverting valves is less than or equal to 1% air conditioning unit and 1% ventilation unit when the system is tested by admitting cold DOP at the respective intake. The frequency of this

(continued)

INSERT "A"

Cumulative operation of the system for at least 2 hours over a 31 day period is sufficient to reduce the buildup of moisture on the adsorbers and HEPA filters. 2 hours time frame is based on conservative engineering evaluation which calculated the time required to evaporate the moisture contained in the air trapped inside the CREACUS duct upstream of charcoal beds.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.7.11.3 (continued)

SR is 18 month 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.

SR 3.7.11.4

This SR verifies that the heaters dissipate 4.8 kw ± 5% when tested in accordance with ANSI N510-1975. The frequency of this SR is 18 months.

SR 3.7.11.5

This SR verifies each CREACUS train starts and operates on an actual or simulated actuation signal. The Frequency of 24 months is consistent with that specified in Reference 3.

SR 3.7.11.6

This SR verifies the integrity of the control room enclosure and the assumed inleakage rates of potentially contaminated air. The control room positive pressure, with respect to potentially contaminated atmosphere, is periodically tested to verify proper function of the CREACUS. During the emergency radiation state of the emergency mode of operation, the CREACUS is designed to pressurize the control room ≥ 0.125 inches water gauge positive pressure with respect to the atmosphere in order to prevent unfiltered inleakage. The CREACUS is designed to maintain this positive pressure with one train.

REFERENCES

1. UFSAR, Section 9.4.
2. UFSAR, Chapter 15.
3. Regulatory Guide 1.52 (Rev. 2).

ATTACHMENT "H"

Proposed Under Technical Specifications Improvement Program (TSIP) Specifications (changed per PCN-407)
UNIT 3

3.7 PLANT SYSTEMS

3.7.11 Control Room Emergency Air Cleanup System (CREACUS)

LCO 3.7.11 Two CREACUS trains shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, 4, 5, and 6,
During movement of irradiated fuel assemblies.

ACTIONS

----------NOTES----------
1. The provisions of LCO 3.0.4 are not applicable when entering MODES 5, 6, or defueled configuration.

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One CREACUS train inoperable.	A.1	Restore CREACUS train to OPERABLE status.	7 days
B. Required Action and associated Completion Time of Condition A not met in MODE 1, 2, 3, or 4.	B.1 AND B.2	Be in MODE 3. Be in MODE 5.	6 hours 36 hours
C. Required Action and associated Completion Time of Condition A not met in MODES 5 or 6, or during movement of irradiated fuel assemblies.	C.1 OR	Place OPERABLE CREACUS train in emergency radiation protection mode.	Immediately (continued)

2. Each Unit shall enter appicable ACTIONS separately

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. (continued)	C.2.1 Suspend CORE ALTERATIONS. AND C.2.2 Suspend movement of irradiated fuel assemblies.	Immediately Immediately
D. Two CREACUS trains inoperable in MODE 1, 2, 3, or 4.	D.1 Enter LCO 3.0.3.	Immediately
E. Two CREACUS trains inoperable in MODES 5 or 6, or during movement of irradiated fuel assemblies.	E.1 Suspend CORE ALTERATIONS. AND E.2 Suspend movement of irradiated fuel assemblies.	Immediately Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.11.1	Operate each CREACUS train for ≥ 2 hours ~~10 hours~~ ~~with the heater, on~~.	31 days
SR 3.7.11.2	Perform required CREACUS filter testing in accordance with Ventilation Filter Testing Program (VFTP).	In accordance with the VFTP

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.7.11.3	Verify that with the system operating at a flow rate of 35485 cfm ±10% for the air conditioning unit, and 2050 ±150 cfm for the ventilation unit and recirculating through the respective HEPA filters and charcoal adsorbers, leakage through the system diverting valves is less than or equal to 1% air conditioning unit and 1% ventilation unit when the system is tested by admitting cold DOP at the respective intake.	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
SR 3.7.11.4	Verify that the heaters dissipate 4.8 kw ± 5% when tested in accordance with ANSI N510-1975.	18 months
SR 3.7.11.3a	Verify each CREACUS train actuates on an actual or simulated actuation signal.	24 months
SR 3.7.11.4a	Verify each CREACUS train can maintain a positive pressure of ≥ 0.125 inches water gauge, relative to the atmosphere during the emergency radiation state of the emergency mode of operation.	24 months

B 3.7 PLANT SYSTEMS

B 3.7.11 Control Room Emergency Air Cleanup System (CREACUS)

BASES

BACKGROUND

The CREACUS provides a protected environment from which operators can control the plant following an uncontrolled release of radioactivity.

The CREACUS consists of two independent, redundant trains that recirculate and filter the control room air. Each CREACUS train consists of emergency air conditioning unit, emergency ventilation air supply unit, emergency isolation dampers, and cooling coils and two cabinet coolers per Unit. Each emergency air conditioning unit includes a prefilter, a high efficiency particulate air (HEPA) filter, an activated carbon adsorber section for removal of gaseous activity (principally iodine), and a fan. A second bank of HEPA filters follows the adsorber section to collect carbon fines. Each emergency ventilation air supply unit includes prefilter, HEPA filter, carbon adsorber and fan. Ductwork, motor-operated dampers, and instrumentation also form part of the system. Air and motor-operated dampers are provided for air volume control and system isolation purposes.

Upon receipt of the actuating signal, normal air supply to the control room is isolated, and the stream of ventilation air is recirculated through the system's filter trains. The prefilters remove any large particles in the air to prevent excessive loading of the HEPA filters and charcoal adsorbers. Continuous operation of each train for at least 15 minutes per month verifies proper system operability.

There are two CREACUS operational modes. Emergency mode is an operational mode when the control room is isolated to protect operational personnel from radioactive exposure through the duration of any one of the postulated limiting faults discussed in Chapter 15 UFSAR (Ref. 2). Isolation mode is an operational mode when the control room is isolated to protect operational personnel from toxic gasses and smoke.

Actuation of the CREACUS places the system into either of two separate states of operation, depending on the initiation signal. Actuation of the system to the emergency mode of operation closes the unfiltered-outside-air intake

(continued)

BASES

BACKGROUND (continued)

and unfiltered exhaust dampers, and aligns the system for recirculation of control room air through the redundant trains of HEPA and charcoal filters. The emergency mode initiates pressurization of the control room.

Outside air is added to the air being recirculated from the control room. Pressurization of the control room prevents infiltration of unfiltered air from the surrounding areas of the building.

The control room supply and the outside air supply of the normal control room HVAC are monitored by radiation and toxic-gas detectors respectively. One detector output above the setpoint will cause actuation of the emergency mode or isolation mode as required. The actions of the isolation mode are more restrictive, and will override the actions of the emergency mode of operation. However, toxic gas and radiation events are not considered to occur concurrently.

A single train will pressurize the control room to at least 0.125 inches water gauge, and provides an air exchange rate in excess of 45% per hour. The CREACUS operation in maintaining the control room habitable is discussed in Reference 1.

Redundant recirculation trains provide the required filtration should an excessive pressure drop develop across the other filter train. Normally-open isolation dampers are arranged in series pairs so that one damper's failure to shut will not result in a breach of isolation. The CREACUS is designed in accordance with Seismic Category I requirements.

The CREACUS is designed to maintain the control room environment for 30 days of continuous occupancy after a Design Basis Accident (DBA) without exceeding a 5-rem whole-body dose.

APPLICABLE SAFETY ANALYSES

The CREACUS components are arranged in redundant safety related ventilation trains. The location of components and ducting within the control room envelope ensures an adequate supply of filtered air to all areas requiring access.

(continued)

BASES

APPLICABLE SAFETY ANALYSES (continued)

The CREACUS provides airborne radiological protection for the control room operators, as demonstrated by the control room accident dose analyses for the most limiting design basis loss of coolant accident fission product release presented in the UFSAR, Chapter 15 (Ref. 2).

The analysis of toxic gas releases demonstrates that the toxicity limits are not exceeded in the control room following a toxic chemical release, as presented in Reference 1.

The worst case single active failure of a component of the CREACUS, assuming a loss of offsite power, does not impair the ability of the system to perform its design function.

The CREACUS satisfies Criterion 3 of the NRC Policy Statement.

LCO

Two independent and redundant trains of the CREACUS are required to be OPERABLE to ensure that at least one is available, assuming that a single failure disables the other train. Total system failure could result in a control room operator receiving a dose in excess of 5 rem in the event of a large radioactive release.

The CREACUS is considered OPERABLE when the individual components necessary to control operator exposure are OPERABLE in both trains. A CREACUS train is considered OPERABLE when the associated:

a. Fan is OPERABLE;

b. HEPA filters and charcoal adsorber are not excessively restricting flow, and are capable of performing their filtration functions; and

c. Ductwork, valves, and dampers are OPERABLE, and air circulation can be maintained.

In addition, the control room boundary must be maintained, or administratively controlled, including the integrity of the walls, floors, ceilings, ductwork, and access doors.

(continued)

BASES

APPLICABILITY

In MODES 1, 2, 3, and 4, the CREACUS must be OPERABLE to limit operator exposure during and following a DBA.

In MODES 5 and 6, the CREACUS is required to cope with the release from a rupture of a waste gas tank.

During movement of irradiated fuel assemblies, the CREACUS must be OPERABLE to cope with the release from a fuel handling accident.

ACTIONS

ACTION statements are modified by ~~two~~ NOTE 1 says: NOTES. "The provisions of LCO 3.0.4 are not applicable when entering MODES 5, 6, or defueled configuration." Therefore, since CREACUS can be inoperable during each individual MODE, it should not be required to have two OPERABLE CREACUS trains before MODE change from defueled from MODE 6 to defueled configuration, and from MODE 4 to MODE 5.

Specification 3.0.4 establishes that entry into an operational mode or other specified condition shall not be made unless the conditions of the LCO are met. Applicability statement "During movement of irradiated fuel assemblies" ensures the OPERABILITY of both CREACUS trains prior to the start of movement of irradiated fuel assemblies.

A.1

With one CREACUS train inoperable, action must be taken to restore OPERABLE status within 7 days. In this Condition, the remaining OPERABLE CREACUS subsystem is adequate to perform control room radiation protection function. However, the overall reliability is reduced because a single failure in the OPERABLE CREACUS train could result in loss of CREACUS function. The 7 day Completion Time is based on the low probability of a DBA occurring during this time period, and the ability of the remaining train to provide the required capability.

NOTE 2 says: "Each Unit shall enter applicable ACTIONS separately." CREACUS is a shared system between Unit 2 and Unit 3. LCO doesn't address the operational situation when the Units are in different operational MODES. Without this NOTE it may not be clear what ACTIONS should be taken

(continued)

BASES

ACTIONS
(continued)

B.1 and B.2

If the inoperable CREACUS cannot be restored to OPERABLE status within the required Completion Time in MODE 1, 2, 3, or 4, the unit must be placed in a MODE that minimizes the accident risk. To achieve this status, the unit must be placed in at least MODE 3 within 6 hours, and in MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

C.1, C.2.1, and C.2.2

In MODE 5 or 6, or during movement of irradiated fuel assemblies, if Required Action A.1 cannot be completed within the required Completion Time, the OPERABLE CREACUS train must be immediately placed in the emergency mode of operation. This action ensures that the remaining train is OPERABLE, that no failures preventing automatic actuation will occur, and that any active failure will be readily detected.

An alternative to Required Action C.1 is to immediately suspend activities that could result in a release of radioactivity that might require isolation of the control room. This places the unit in a condition that minimizes the accident risk. This does not preclude the movement of fuel assemblies to a safe position.

D.1

If both CREACUS trains are inoperable in MODE 1, 2, 3, or 4, the CREACUS may not be capable of performing the intended function and the unit is in a condition outside the accident analyses. Therefore, LCO 3.0.3 must be entered immediately.

E.1 and E.2

When in MODES 5 or 6, or during movement of irradiated fuel assemblies with two trains inoperable, action must be taken immediately to suspend activities that could result in a release of radioactivity that might enter the control room.

(continued)

INSERT "A"

Cumulative operation of the system for at least 2 hours over a 31 day period is sufficient to reduce the buildup of moisture on the adsorbers and HEPA filters. 2 hours time frame is based on conservative engineering evaluation which calculated the time required to evaporate the moisture contained in the air trapped inside the CREACUS duct upstream of charcoal beds.

BASES

ACTIONS (continued)

This places the unit in a condition that minimizes the accident risk. This does not preclude the movement of fuel to a safe position.

SURVEILLANCE REQUIREMENTS

SR 3.7.11.1

Standby systems should be checked periodically to ensure that they function properly. Since the environment and normal operating conditions on this system are not severe, testing each train once every month provides an adequate check on this system.

INSERT A →

Systems with heaters must be operated for ≥ 10 continuous hours with the heaters energized. This is sufficient to reduce the buildup of moisture on the adsorbers and HEPA filters. The 31 day Frequency is based on the known reliability of the equipment, and the two train redundancy available.

SR 3.7.11.2

This SR verifies that the required CREACUS testing is performed in accordance with the Ventilation Filter Testing Program (VFTP). The CREACUS filter tests are based on Regulatory Guide 1.52 (Ref. 3). The VFTP includes testing HEPA filter performance, charcoal adsorber efficiency, minimum system flow rate, and the physical properties of the activated charcoal (general use and following specific operations). Specific test frequencies and additional information are discussed in detail in the VFTP.

SR 3.7.11.3

This SR verifies that with the system operating at a flow rate of 35485 cfm ±10% for the air conditioning unit, and 2050 ±150 cfm for the ventilation unit and recirculating through the respective HEPA filters and charcoal adsorbers, leakage through the system diverting valves is less than or equal to 1% air conditioning unit and 1% ventilation unit when the system is tested by admitting cold DOP at the respective intake. The frequency of this

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.7.11.3 (continued)

SR is 18 month 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.

SR 3.7.11.4

This SR verifies that the heaters dissipate 4.8 kw ± 5% when tested in accordance with ANSI N510-1975. The frequency of this SR is 18 months.

SR 3.7.11.3

This SR verifies each CREACUS train starts and operates on an actual or simulated actuation signal. The Frequency of 24 months is consistent with that specified in Reference 3.

SR 3.7.11.4

This SR verifies the integrity of the control room enclosure and the assumed inleakage rates of potentially contaminated air. The control room positive pressure, with respect to potentially contaminated atmosphere, is periodically tested to verify proper function of the CREACUS. During the emergency radiation state of the emergency mode of operation, the CREACUS is designed to pressurize the control room ≥ 0.125 inches water gauge positive pressure with respect to the atmosphere in order to prevent unfiltered inleakage. The CREACUS is designed to maintain this positive pressure with one train.

REFERENCES

1. UFSAR, Section 9.4.
2. UFSAR, Chapter 15.
3. Regulatory Guide 1.52 (Rev. 2).

ATTACHMENT "I"

Additional Information