CP&L
A Progress Energy Company

John S. Keenan
Vice President
Brunswick Nuclear Plant

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U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

BRUNSWICK STEAM ELECTRIC PLANT, UNIT NOS. 1 AND 2
DOCKET NOS. 50-325 AND 50-324/LICENSE NOS. DPR-71 AND DPR-62
RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION - REQUEST FOR LICENSE AMENDMENTS TO ADOPT ALTERNATIVE RADIOLOGICAL SOURCE TERM (NRC TAC NOS. MB2570 AND MB2571)

Ladies and Gentlemen:

On August 1, 2001 (Serial: BSEP 01-0063), Carolina Power & Light (CP&L) Company submitted a license amendment application to allow a full-scope implementation of an Alternative Radiological Source Term (AST) for the Brunswick Steam Electric Plant (BSEP), Units 1 and 2. Subsequently, on December 20, 2001, the NRC provided an electronic version of a request for additional information (RAI) regarding the seismic ruggedness of the proposed alternate leakage treatment path. The response to this RAI is enclosed.

Please refer any questions regarding this submittal to Mr. Leonard R. Beller, Manager - Regulatory Affairs, at (910) 457-2073.

Sincerely,

John S. Keenan

John S. Keenan

A001

P.O. Box 10429
Southport, NC 28461

> 910.457.2496
> 910.457.2803

WRM/wrm

Enclosures:
1. Response to Request For Additional Information (RAI) AST 5
2. Plant Procedure 0OP-37, "Control Building Ventilation System Operating Procedure"
3. Lesson Plan LOCT-CLS-LP-500-02-1, "EOP Summary of Changes for EPUR"
4. System Description SD-37, "Control Building Heating, Ventilation, and Air-Conditioning System"

John S. Keenan, having been first duly sworn, did depose and say that the information contained herein is true and correct to the best of his information, knowledge and belief; and the sources of his information are officers, employees, and agents of Carolina Power & Light Company.

Dean S. Mason
Notary (Seal)

My commission expires: 8-29-04

cc: U. S. Nuclear Regulatory Commission, Region II
ATTN: Dr. Bruce S. Mallett, Regional Administrator
Sam Nunn Atlanta Federal Center
61 Forsyth Street, SW, Suite 23T85
Atlanta, GA 30303-8931

U. S. Nuclear Regulatory Commission
ATTN: Mr. Theodore A. Easlick, NRC Senior Resident Inspector
8470 River Road
Southport, NC 28461-8869

Ms. Jo A. Sanford
Chair - North Carolina Utilities Commission
P.O. Box 29510
Raleigh, NC 27626-0510

Mr. Mel Fry
Director - Division of Radiation Protection
North Carolina Department of Environment and Natural Resources
3825 Barrett Drive
Raleigh, NC 27609-7221

BRUNSWICK STEAM ELECTRIC PLANT, UNIT NOS. 1 AND 2
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RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION - REQUEST FOR LICENSE AMENDMENTS TO ADOPT ALTERNATIVE RADIOLOGICAL SOURCE TERM
(NRC TAC NOS. MB2570 AND MB2571)

Response to Request For Additional Information (RAI) AST 5

Background

On August 1, 2001 (Serial: BSEP 01-0063), Carolina Power & Light (CP&L) Company submitted a license amendment application to allow a full-scope implementation of an Alternative Radiological Source Term (AST) for the Brunswick Steam Electric Plant (BSEP), Units 1 and 2. Subsequently, on December 20, 2001, the NRC Equipment and Human Performance Branch (IEHB), provided an electronic version of a RAI regarding the use of manual, instead of automatic, initiation of control room isolation following a fuel handling accident.

NRC Question 5-1

Provide a description of all operator actions or manipulations required to complete the manual control room isolation. For each action or manipulation:

A. State the location and describe any adverse environmental conditions (e.g., temperature, humidity, noise, lighting, radiation).

B. Describe the ingress and egress paths and accessibility to the required equipment.

C. Provide a copy of the applicable procedural guidance.

D. Describe the required training, including operator qualifications and provide a copy of the related training material.

E. State the information required and instrumentation relied upon to determine the need for action and to verify action completion, including instrument quality requirements.

F. State the amount of time assumed to recognize the need for action and the amount of time assumed available to complete the action after the need is recognized.

Provide estimates of the time actually required to complete these actions and the basis for these estimates.

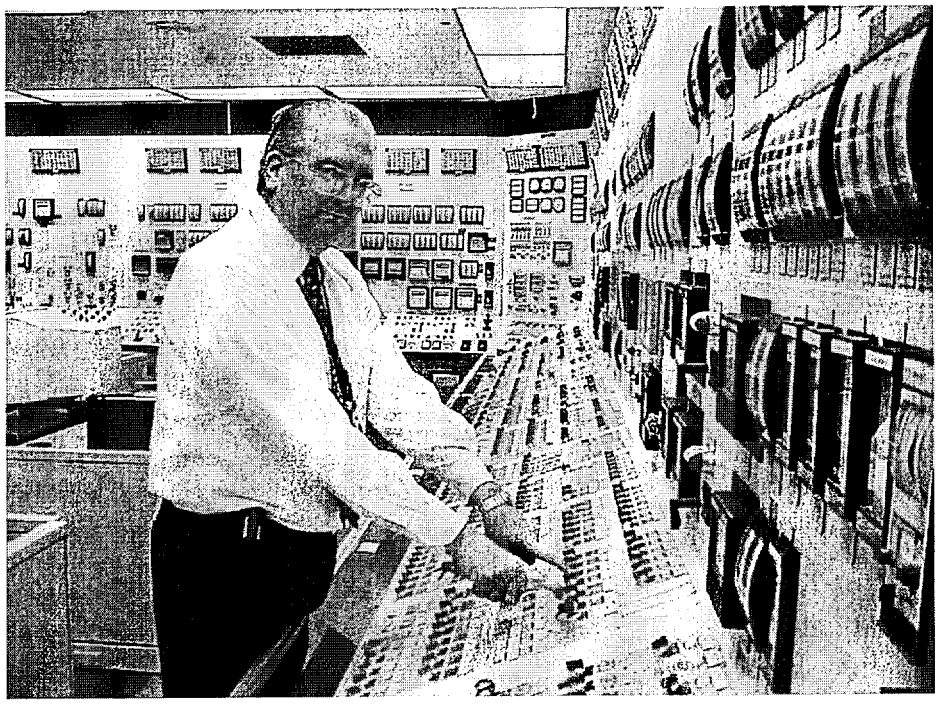
G. Describe the operator's ability to recover from credible errors in performing the action or manipulation.

H. Describe the level of staffing required to complete the action, concurrent duties or responsibilities of the required personnel, and basis for concluding adequate availability of required staff.

I. State the risk significance of the action.

CP&L Response

Manual Control Room isolation is accomplished by manipulation of two control switches located in the Control Room. The two control switch actions required to accomplish Control Room isolation are: place one Control Building emergency recirculation fan in "ON"; and stop the Control Building washroom exhaust fan. The verifications and control switch actions are included on the same Control Room panel. The picture below, taken at the BSEP simulator, shows a former control room shift superintendent pointing to the two required control switches.



Part A: The actions required to isolate the Control Room Heating, Ventilation, and Air Conditioning System (i.e., change from normal to emergency recirculation mode)

are accomplished by manipulation of control switches in the Control Room. No adverse environmental conditions are anticipated.

Part B: Since the realignment of the Control Room to emergency recirculation mode is accomplished entirely in the Control Room, there are no ingress or egress paths or accessibility requirements applicable to the evolution.

Part C: The procedural guidance for manual start-up of the Control Building Ventilation System in emergency recirculation mode, which includes Control Room emergency recirculation, is contained on pages 14 and 15 of plant procedure 0OP-37, "Control Building Ventilation System Operating Procedure." Procedure steps 5.3.2.1.a and 5.3.2.1.d correspond with the two control switch manipulations described above which are necessary to accomplish isolation of the Control Room; procedure steps 5.3.2.1.e through 5.3.2.1.g are not required in order to ensure isolation of the Control Room is accomplished. A copy of plant procedure 0OP-37 is provided in Enclosure 2.

Part D: There is no special training or qualification for placing the Control Room Ventilation System in the emergency recirculation mode because the evolution is covered in existing normal system training for operators. However, placement of the Control Building Ventilation System in emergency recirculation mode is being covered as part of licensed operator continuing training on Emergency Operating Procedure changes associated with implementation of Extended Power Uprate. Enclosure 3 provides a copy of Lesson Plan LOCT-CLS-LP-500-02-1, Revision 0, for the licensed operator continuing training. Placement of the Control Building Ventilation System in emergency recirculation mode is being addressed in conjunction with EOPs 1EOP-01-RVCP (i.e., page 11 of the lesson plan) and 0EOP-04-RRCP (i.e., page 12 of the lesson plan).

Part E: The following information and indications are used to determine the need to manually initiate Control Room isolation:

(1) Fuel Handling Accident: Continuous communications are maintained between the refuel bridge and the Control Room during refueling, thereby providing immediate notification of the occurrence of a dropped fuel assembly. Back-up communications, via Plant Public Address System, can also be used for this purpose. A radioactive release associated with a dropped fuel bundle would be indicated by a refuel floor high radiation alarm, a Reactor Building ventilation high radiation alarm, and by various area radiation monitor and continuous air monitor alarms. In support of AST implementation, BSEP Abnormal Operating Procedure (AOP) 0AOP-5.0, "Radioactive Spills, High Radiation, and Airborne Activity," is being revised to direct operator realignment of the Control Room

Ventilation System to the emergency recirculation mode following a dropped fuel assembly.

(2) Loss-of-Coolant Accident (LOCA), Main Steam Line Break (MSLB), and Control Rod Drop Accident (CRDA): Symptom-based Emergency Operating Procedures (EOPs) will provide guidance to manually initiate Control Building ventilation emergency recirculation mode upon detection of selected indications. Indications used as input for these EOPs include: high main steam line radiation, high off-gas radiation (i.e., steam jet air ejector or plant stack), high Reactor Building roof ventilation radiation, and high Turbine Building ventilation radiation.

As previously stated, manual Control Room isolation is accomplished by manipulation of two control switches located the on the benchboard section of the Reactor Turbine Gage Board (RTGB) in the Control Room. Lights indicating the status of the associated fans and dampers are located immediately adjacent to each switch.

Part F: Since the action to manually isolate the Control Room is based on indications, not requiring diagnosis of conditions, other than recognize/respond to the indication, the time required to decide that action is required will be extremely short. Total time to recognize the indication and to accomplish Control Room isolation is estimated to be substantially less than two minutes, based on operator experience. In comparison, the AST analyses have been performed assuming manual isolation of the Control Room at 20 minutes following initiation of the accident.

Part G: Placing the Control Room Ventilation System in the emergency recirculation mode (i.e., isolated) consists of two specific switch manipulations by the Control Operator to complete the alignment. The switches are located on the benchboard section of the RTGB, within eight inches of each other. In the event that incorrect switch manipulations were performed, the indicating lights associated with the correct switches would not change state to indicate proper alignment. Also, during off-normal events, standard practice is that required actions are verified, by another operator and/or the Shift Technical Advisor, to ensure proper alignment of equipment for the conditions that exist. If the operator should fail to actuate either of the two "required" switches, no action (i.e., resets, manual re-alignment, etc.) would be necessary to correctly align the Control Room Ventilation System other than to actuate the necessary switch.

Part H: Placing the Control Room in the emergency recirculation mode is accomplished in accordance with the system operating procedure (i.e., 0OP-37). Only one Control Operator is needed complete alignment of the Control Room Ventilation System to the emergency recirculation mode. Realignment of the Control Room Ventilation System to the emergency recirculation mode is an existing, normal

response to symptom-based conditions. During off-normal events, standard practice is that required actions are verified, by another operator and/or the Shift Technical Advisor. The actions necessary to align the Control Room Ventilation System to the emergency recirculation mode are currently being accomplished with the normal Control Room staffing; no change to this capability will occur as a result of the proposed crediting of manual isolation of the Control Room. On this basis, CP&L has concluded that adequate availability of required staff exists.

Part I: There is no risk associated with placing the Control Room in the emergency recirculation mode.

NRC Question 5-2

Provide a system description manual or training lesson plan for "Control Room Ventilation."

CP&L Response

A copy of the system description for Control Building Ventilation System (i.e., SD-37, "Control Building Heating, Ventilation, and Air-Conditioning System") is provided in Enclosure 4.

NRC Question 5-3

Provide a simplified schematic drawing of "Control Room Ventilation," including key valves and dampers.

CP&L Response

The normal line-up for the Control Building Ventilation System is shown in Figure 37-1, "Control Building Ventilation System: Normal Flowpaths" of the system description, SD-37, provided as Enclosure 4. The emergency recirculation mode line-up (i.e., Control Room isolated) for the Control Building Ventilation System is shown in Figure 37-2, "Control Building Ventilation System: Detected High Rad/Fire" of the system description.

NRC Question 5-4

Provide a description of the effect, if any, of the following relaxations on operator ability to identify the need for, and complete, manual control room isolation:

A. Control Room Emergency Ventilation intake radiation monitors not required to be operable

B. Secondary containment instruments allowed to be inoperable

CP&L Response

In regards to the relaxations requested for Control Room ventilation intake radiation monitors and the secondary containment instruments (i.e., Reactor Building ventilation radiation monitor), during Modes 4 and 5, these instruments will not be relied on to identify the need for Control Room isolation.

As discussed in the response to NRC Question 5-1, Part E, the indication relied upon during refueling is the report of a dropped assembly by direct communications with the refuel bridge (i.e., a fuel handling accident). For the LOCA, MSLB, and CRDA, there are no relaxations in the requirements for instrument availability.

NRC Question 5-5

Provide a description of any operational or safety benefits anticipated from the substitution of manual for automatic initiation of control room isolation.

CP&L Response

The removal of Technical Specification requirements for automatic initiation of Control Room isolation is only being requested for periods when both units are in Modes 4 and 5. During periods when either unit is operating in Modes 1, 2, or 3, the capability for automatic initiation of Control Room isolation will continue to be required by the Technical Specifications. As such, the use of the manual initiation of Control Room isolation is a conservative assumption used in the Control Room operator dose calculations for the LOCA, MSLB, and CRDA.

The substitution of manual for automatic initiation of Control Room isolation is a change associated with implementation of the generic Boiling Water Reactor (BWR) Technical Specification change, Technical Specification Task Force (TSTF) Standard Technical Specification Change Traveler TSTF-51, "Revise Containment Requirements During Handling Irradiated Fuel and Core Alterations," Revision 2. The TSTF-51 generic change has been previously approved by the NRC. TSTF-51 includes Technical Specification changes eliminating requirements for the operability of the Control Room Ventilation System (i.e., referred to as the Main Control Room Environmental Control (MCREC) System in the TSTF-51 Technical Specification mark-ups), and its associated actuation instrumentation, during core alterations. This change is based on the recognition that, after reactor shutdown, decay of short-lived fission products greatly reduces the fission product inventory present in irradiated fuel.

Although the generic TSTF-51 change supports elimination of Technical Specification operability requirements for the Control Room Ventilation System isolation initiation instrumentation during core alteration activities, because the BSEP Control Room is a common facility for both BSEP units, substantial operational benefit (i.e., in regards to the system for

automatic isolation of the Control Room) will only be recognized during periods involving a dual-unit shutdown in conjunction with core alterations on one or both units.

ENCLOSURE 2

BRUNSWICK STEAM ELECTRIC PLANT, UNIT NOS. 1 AND 2
DOCKET NOS. 50-325 AND 50-324/LICENSE NOS. DPR-71 AND DPR-62
RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION - REQUEST FOR LICENSE AMENDMENTS TO ADOPT ALTERNATIVE RADIOLOGICAL SOURCE TERM
(NRC TAC NOS. MB2570 AND MB2571)

Plant Procedure 0OP-37,
"Control Building Ventilation System Operating Procedure"

PLANT OPERATING MANUAL

VOLUME III

OPERATING PROCEDURE

UNIT
0

0OP-37

CONTROL BUILDING VENTILATION SYSTEM OPERATING PROCEDURE

REVISION 42

TABLE OF CONTENTS

TABLE OF CONTENTS

1.0 PURPOSE

This procedure provides the prerequisites, precautions, limitations, and instructional guidance for the startup, operation, and shutdown of the Control Building Ventilation System.

2.0 REFERENCES

2.1 Unit 1 and 2 Technical Specifications

2.2 Technical Requirements Manual

2.3 FSAR Section 6.4, Habitability System

2.4 FSAR Section 9.4.1, Control Building Ventilation System

2.5 P&ID 9527-F-4080, Control Building Units 1 & 2 Air Flow Diagram

2.6 SD-37, Control Building Heating, Ventilation, and Air Conditioning System

2.7 1(2)OP-11, Radiation Monitoring System

2.8 0OP-42, Fire Detection System

2.9 1(2)OP-50, Plant Electric System

2.10 0OP-50.1, Diesel Generator Emergency Power System

2.11 1(2)OP-52, 120 Volt UPS, Emergency, and Conventional Electrical Systems

3.0 PRECAUTIONS AND LIMITATIONS

3.1 The ambient temperature within the battery room should remain above 77°F to retain the specific gravity of the batteries.

> **NOTE:** For every 3°F drop in electrolyte temperature, the specific gravity drops by one point.

3.2 **IF** battery room ventilation flow is secured, **THEN** the battery must **NOT** be in an equalize mode.

3.3 Units 1 and 2 Cable Spreading Area Ventilation Fans have keylock bypass switches which will allow restarting the fans under emergency conditions such as high radiation or fire. Careful consideration should be given to the reasons for bypassing these interlocks.

3.0 PRECAUTIONS AND LIMITATIONS

3.4 The following equipment will be automatically shut down on signals from the radiation and smoke detection systems:

3.4.1 Control Building Washroom Exhaust Fan.

3.4.2 Cable Spread Room Vent Fans.

3.4.3 Control Building Mechanical Equipment Room Vent Fans.

3.4.4 Normal Makeup Air Damper Closes.

3.5 Self-contained breathing apparatus are provided in the Control Room for respiratory and eye protection during emergencies.

3.6 The Control Room area radiation monitor trip point is 1 mr/hr. The Control Building intake duct radiation monitor trip point is 7 mr/hr. Upon high radiation signal, the normal ventilation intake dampers are expected to close automatically within 5 seconds.

3.7 The following equipment will trip on detection of chlorine at the Control Room intake **OR** the chlorine loading area:

3.7.1 Control Building Mechanical Equipment Room Vent Fans

3.7.2 Cable Spread Room Vent Fans

3.7.3 Control Building Washroom Exhaust Fan

3.7.4 Normal and Emergency Air Makeup Dampers Close

3.7.5 Emergency Recirculation Fans

3.8 Upon detection of chlorine at the CB ventilation intake **OR** the chlorine loading area, the emergency recirculation system fans will **NOT** operate in order to prevent degradation of the charcoal filters by chlorine contamination and prevent introduction of chlorine gas into the Control Room area.

3.9 During hazardous weather conditions (i.e., tornado), the tornado pressure check valves may actuate, shutting off normal ventilation intake and exhaust.

3.0 PRECAUTIONS AND LIMITATIONS

3.10 The following Technical Specification and Technical Requirements Manual requirements shall be observed for the Control Building Ventilation System:

3.10.1 Section 3.3.7.1. Control Room Emergency Ventilation (CREV) Instrumentation

3.10.2 Section 3.7.3, Control Room Emergency Ventilation (CREV) System

3.10.3 Section 3.7.4, Control Room Air Conditioning (AC) System

3.10.4 Section 5.5.7, Ventilation Filter Testing Program (VFTP)

3.10.5 TRMS 3.18, Control Room Emergency Ventilation (CREV) System Smoke Protection Mode

3.10.6 TRMS 3.19, Control Room Emergency Ventilation (CREV) System Chlorine Protection Mode

3.11 **IF** a fire exists in a battery room, the appropriate supply and exhaust fans shall be shut down by the Control Room operator. This will allow the HVAC fire dampers to operate, if required.

Fire Zone	Battery Room	Supply Fan	Exhaust Fan
C7	1A	1-VA-1C-SF-CB	1-VA-1C-EF-CB
C8	2A	2-VA-2C-SF-CB	2-VA-2C-EF-CB
C12	1B	1-VA-1B-SF-CB	1-VA-1B-EF-CB
C11	2B	2-VA-2B-SF-CB	2-VA-2B-EF-CB

3.12 The Control Building Mechanical Equipment Room Vent Fans are not thermostatically controlled and can be stopped only by simultaneously placing both Units' control switches in *OFF.*

3.13 The Control Building Mechanical Equipment room must be maintained above 32°F to support proper operation of the chlorine detectors located in the room.

3.0 PRECAUTIONS AND LIMITATIONS

3.14 Power to the Control Room Air Conditioning Subcooling Condensing Units is normally off. They are not normally needed to maintain Control Room temperature. Contact HVAC Engineer prior to operating the Subcooler Units. If these units are going to be placed in operation, **THEN** power should be restored for at least 10 hours prior to starting these units. This precaution is necessary to allow the crankcase heaters sufficient time to heat up the compressor crankcase oil and prevent entrainment of freon into the oil. Crankcases may be "warmed" via external means such as heat lamps or space heaters in emergency situations.

3.15 **IF** a CREV fan, *2A(B)-ERF-CB*, is placed in *ON*, **THEN** the non-operating fan will **NOT** auto start upon an initiation signal.

4.0 PREREQUISITES

4.1 Plant Electric System is in operation in accordance with 1(2)OP-50.

4.2 120 Volt UPS, Emergency, and Conventional Electrical System is in operation in accordance with 1(2)OP-52.

4.3 Radiation Monitoring System is in operation in accordance with 1(2)OP-11.

4.4 Fire Detection System is in operation in accordance with 0OP-42.

4.5 Diesel Generator Emergency Power System is in standby readiness in accordance with 0OP-50.1.

4.6 Control Building Ventilation System Electrical Lineup complete in accordance with Attachment 1.

4.7 Control Building Ventilation System Panel Lineup complete in accordance with Attachment 2.

4.8 Control Building Ventilation System Valve Lineup complete in accordance with Attachment 3.

5.0 STARTUP

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Continuous
Use

5.1 Control Building Ventilation System

5.1.1 Initial Conditions

1. All applicable prerequisites as listed in Section 4.0 are met. ☐

5.1.2 Procedural Steps

NOTE: The compressor will cycle (load and unload) in response to system air demand.

1. **PLACE** *CB STBY INSTR AIR COMPR A* control switch in *AUTO.* ☐

2. **PLACE** *CB STBY INSTR AIR COMPR B* control switch in *AUTO.* ☐

NOTE: Turning a fan's control switch to *START* causes the fan's associated damper(s) to open. **WHEN** the damper is full open, **THEN** the fan will start. The fan running lights on XU-3 are actuated by flow switches.

NOTE: The Control Building Mechanical Equipment room must be maintained above 32°F to support proper operation of the chlorine detectors.

3. **START** *CB MECHANICAL EQUIP ROOM VENT FANS, 2F-SF-CB* and *2E-EF-CB.* ☐

4. **START** *BATTERY ROOM 2A VENT FANS, 2C-SF-CB* and *2C-EF-CB.* ☐

5. **CLOSE** *BATTERY ROOM 2A HEATER BREAKER* at *MCC-2TG COMP COE.* ☐

6. **START** *BATTERY ROOM 2B VENT FANS, 2B-SF-CB* and *2B-EF-CB.* ☐

7. **CLOSE** *BATTERY ROOM 2B HEATER BREAKER* at *MCC-2TG COMP COF.* ☐

5.1.2 Procedural Steps

8. **START** *BATTERY ROOM 1A VENT FANS, 1C-SF-CB* and *1C-EF-CB.* ☐

9. **CLOSE** *BATTERY ROOM 1A HEATER BREAKER* at *MCC-1TG COMP COE.* ☐

10. **START** *BATTERY ROOM 1B VENT FANS, 1B-SF-CB* and *1B-EF-CB.* ☐

11. **CLOSE** *BATTERY ROOM 1B HEATER BREAKER* at *MCC-1TG COMP COF.* ☐

NOTE: Temperature control of the battery rooms is accomplished by vortex dampers located on the suction side of each battery room supply fan and a duct heater in the supply duct for each battery room to maintain the temperature above 77°F.

CAUTION

The ambient temperature within the battery room should remain above 77°F to maintain the specific gravity of the batteries.

12. **PLACE** *CABLE SPREAD ROOM 1 VENT FANS, 1A-SF-CB* and *1A-EF-CB* in *AUTO.* ☐

13. **PLACE** *CABLE SPREAD ROOM 2 VENT FANS, 2A-SF-CB* and *2A-EF-CB* in *AUTO.* ☐

14. **START** *CB WASHROOM EXHAUST FAN, 2D-EF-CB.* ☐

NOTE: Turning a fan's control switch to *START* causes the fan's associated damper to open. **WHEN** the damper is full open, **THEN** the supply fan and air conditioner will start.

15. **START** Unit 2 *CTL ROOM A/C & SUPPLY FAN, 2D-CU-CB* and *2D-SF-CB.* ☐

5.1.2 Procedural Steps

16. **START** Unit 1 *CTL ROOM A/C & SUPPLY FANS, 1D-CU-CB* and *1D-SF-CB.* ☐

NOTE: The subcooling units are not needed to maintain Control Room temperature, and are normally turned off. If energized they operate automatically in conjunction with the condensing unit in response to outside ambient temperature.

NOTE: The following controls and indications are located on Unit 2 Panel XU-3.

17. **PLACE** *CB EMERG RECIRC FAN, 2A(B)-ERF-CB,* in *PREF.* ☐

18. **PLACE** *CB EMERG RECIRC FAN, 2B(A)-ERF-CB,* in *STBY.* ☐

NOTE: The following controls and indications are located by the Control Building condensing units, elevation 70', at the local control panel.

19. **START** Mechanical Equipment Room Booster Fan, *1-1A-BF-CB.* ☐

20. **START** Mechanical Equipment Room Booster Fan, *2-2A-BF-CB.* ☐

21. **COMPLETE** Attachment 4. ☐

5.2 Automatic Startup of the Control Building Emergency Recirculation System

I
Information Use

5.2.1 Initial Conditions

1. The Control Building Emergency Air Supply System has received an automatic initiation signal from one of the following:

   a. Control Room area radiation, 1 mr/hr ± .05 mr increasing

   OR

   b. Control Building intake duct, 7 mr/hr ± .05 mr increasing

   OR

   c. Control Room fire detector.

2. The chlorine detection monitors are reset.

5.2.2 Procedural Steps

1. **IF** automatic initiation of the Control Building Emergency Recirculation System is due to Control Room area high radiation, **THEN OBSERVE** the following:

NOTE: Controls and indications for *CB EMERG RECIRC FANS A* and *B* are located on Unit 2 Panel XU-3. Indications only are located on Unit 1 Panel XU-3.

NOTE: **IF** power is available from the normal source, **THEN** the Emergency Recirculation Supply Fan starts immediately, **OR**, if power is lost, the fan starts as soon as the diesel ties onto the bus.

   a. The preferred *CB EMERG RECIRC FAN A(B)* starts as indicated by red light being on and the associated *INLET AND OUTLET ISOLATION DAMPERS* open.

NOTE: **IF** preferred supply fan fails to start, **THEN** the standby fan should start 10 seconds after the preferred fan fails to start.

5.2.2 Procedural Steps

CAUTION

Detection of heat in the charcoal bed, Zone 15 for A and Zone 16 for B, will trip the associated Emergency Recirculation Fan.

b. *CB EMERG RECIRC DAMPER, VA-2J-D-CB,* opens.

c. *CTL RM NORM MU AIR DMPR, 2L-D-CB,* closes.

d. *CB MECHANICAL EQUIP ROOM VENT FANS* supply and exhaust dampers close **AND** supply fan, *2F-SF-CB,* and exhaust fan, *2E-EF-CB,* trip.

e. *CABLE SPREAD ROOM 2 VENT FANS* supply and exhaust dampers close **AND** supply fan, *2A-SF-CB,* and exhaust fan, *2A-EF-CB,* trip.

CAUTION

Unit 2 Cable Spread Supply Fan, *2A-SF-CB,* and Exhaust Fan, *2A-EF-CB,* can be restarted, as directed by the Shift Supervisor, by using *CABLE SPREAD ROOM 2 VENT EMERG BYPASS* switch on Unit 2 Panel XU-3.

f. *CABLE SPREAD ROOM 1 VENT FANS* supply and exhaust dampers close **AND** supply fan, *1A-SF-CB,* and exhaust fan, *1A-EF-CB,* trip.

CAUTION

Unit I Cable Spread Supply Fan, *1A-SF-CB,* and Exhaust Fan, *1A-EF-CB,* can be restarted, as directed by the Shift Supervisor, by using *CABLE SPREAD ROOM 1 VENT EMERG BYPASS* switch on Unit 1 Panel XU-3.

g. *CB WASHROOM EXHAUST FAN* damper closes and exhaust fan, *2D-EF-CB,* trips.

5.2.2 Procedural Steps

2. **IF** automatic initiation of the Control Building Emergency Recirculation System is due to Control Room fire detector trip, **THEN OBSERVE** the following:

NOTE: Controls and indications for *CB EMERG RECIRC FANS A* and *B* are located on Unit 2 Panel XU-3. Indications only are located on Unit 1 Panel XU-3.

NOTE: **IF** power is available from the normal source, **THEN** the Emergency Recirculation Supply Fan starts immediately, **OR** if power is lost, the fan starts as soon as the diesel ties onto the bus.

a. The preferred *CB EMERG RECIRC FAN A(B)* starts as indicated by red light being on and the associated *INLET AND OUTLET ISOLATION DAMPERS* open.

NOTE: **IF** preferred supply fan fails to start, **THEN** the standby fan should start 10 seconds after the preferred fan fails to start.

CAUTION

Detection of heat in the charcoal bed, Zone 15 for A and Zone 16 for B, will trip the associated emergency recirculation fan.

b. *CB EMERG RECIRC DAMPER, VA-2J-D-CB,* opens.

c. *CTL RM NORM MU AIR DMPR, 2L-D-CB,* closes.

d. *CB WASHROOM EXHAUST FAN* damper closes **AND** exhaust fan, *2D-EF-CB*, trips.

3. **WHEN** the initiation signal clears, **THEN RESTART** Control Building Ventilation System in accordance with Section 5.4.

5.3 Manual Startup of the Control Building Emergency Recirculation System

C
Continuous
Use

5.3.1 Initial Conditions

1. All applicable prerequisites as listed in Section 4.0 are met. ☐

2. The Control Building Emergency Recirculation System has failed to start after an initiation signal, ☐

OR

Surveillance or inspection tests are required. ☐

5.3.2 Procedural Steps

NOTE: Indications for the Control Building Ventilation System are located on Panels XU-3 on both units.

NOTE: Controls for the Mechanical Equipment Room Ventilation Fans and the Control Building Wash Room Exhaust Fan are on XU-3 on Units 1 and 2.

NOTE: Controls for the Control Building Emergency Recirculation Fans are on Panel XU-3 on Unit 2.

NOTE: Controls for the Cable Spread Room ventilation fans are on Panel XU-3 for the respective unit.

1. **PERFORM** the following to place the Control Building Emergency Recirculation System in the area high radiation mode:

NOTE: Placing one of the *CB EMERG RECIRC FANS, 2A(B)-ERF-CB*, in *ON* will inop the automatic start function of the non-operating fan.

a. **PLACE** one of the *CB EMERG RECIRC FANS, 2A(B)-ERF-CB*, in *ON.* ☐

5.3.2 Procedural Steps

CAUTION

Detection of heat in the charcoal bed, Zone 15 for Fan 2A and Zone 16 for Fan 2B, will trip the associated Emergency Recirculation Fan.

b. **ENSURE** *CTL RM NORM MU AIR DMPR, 2L-D-CB,* closes. ☐

c. **ENSURE** *CB EMERG RECIRC DAMPER, VA-2J-D-CB,* opens. ☐

d. **STOP** *CB WASHROOM EXHAUST FAN, 2D-EF-CB,* **AND ENSURE** associated damper closes. ☐

e. **STOP** *CB MECHANICAL EQUIP ROOM VENT FANS 2F-SF-CB* and *2E-EF-CB* **AND ENSURE** associated supply and exhaust dampers close. ☐

f. **STOP** *CABLE SPREAD ROOM 2 VENT FANS 2A-SF-CB* and *2A-EF-CB* **AND ENSURE** associated supply and exhaust dampers close. ☐

g. **STOP** *CABLE SPREAD ROOM 1 VENT FANS 1A-SF-CB* and *1A-EF-CB* **AND ENSURE** associated supply and exhaust dampers close. ☐

NOTE: The Control Building Emergency Recirculation System is now in operation for high radiation conditions.

2. **PERFORM** the following to place the Control Building Emergency Recirculation System in the fire mode:

NOTE: Placing one of the *CB EMERG RECIRC FANS, 2A(B)-ERF-CB,* in *ON* will inop the automatic start function of the non-operating fan.

a. **PLACE** one of the *CB EMERG RECIRC FANS, 2A(B)-ERF-CB,* in *ON.* ☐

5.3.2 Procedural Steps

CAUTION

Detection of heat in the charcoal bed, Zone 15 for Fan 2A and Zone 16 for Fan 2B, will trip the associated Emergency Recirculation Fan.

b. **ENSURE** *CTL RM NORM MU AIR DMPR, 2L-D-CB,* closes. ☐

c. **ENSURE** *CB EMERG RECIRC DAMPER, VA-2J-D-CB,* opens. ☐

d. **STOP** *CB WASHROOM EXHAUST FAN 2D-EF-CB* **AND ENSURE** associated damper closes. ☐

NOTE: The Control Building Emergency Recirculation System is now in operation for fire conditions.

3. **WHEN** the initiating conditions have cleared, **THEN PLACE** Control Building Ventilation System in operation in accordance with Section 5.4. ☐

5.4 Placing the Control Building Ventilation System in Operation Following an Auto or Manual Initiation of the Emergency Recirculation System

C
Continuous
Use

5.4.1 Initial Conditions

1. Control Building Ventilation System is in operation in accordance with Section 5.2 or 5.3. ☐

2. The Control Building Emergency Recirculation System initiation signals are reset, ☐

OR

Surveillance or testing is complete. ☐

3. The chlorine detection monitors are reset. ☐

5.4.2 Procedural Steps

NOTE: Controls and indications for the Control Building Emergency Recirculation System are located on Unit 2 Panel XU-3, while indication only is provided on Unit 1 Panel XU-3.

1. **STOP** the *CB EMERG RECIRC FAN* which is running by placing the control switch to *PREF.* ☐

2. **PLACE** one of the following control switches to *PREF* and the other to *STBY*:

   a. *CB EMERG RECIRC FAN, 2A-ERF-CB* ☐

   b. *CB EMERG RECIRC FAN, 2B-ERF-CB.* ☐

3. **ENSURE** *CB EMERG RECIRC DAMPER, VA-2J-D-CB,* is closed. ☐

4. **ENSURE** *CTL RM NORM MU AIR DMPR, 2L-D-CB,* opens. ☐

5.4.2 Procedural Steps

5. **START** *CB WASHROOM EXHAUST FAN, 2D-EF-CB.* ☐

NOTE: The Control Building Mechanical Equipment room must be maintained above 32°F to support proper operation of the chlorine detectors.

6. **START** *CB MECHANICAL EQUIP ROOM VENT FANS, 2E-EF-CB* and *2F-SF-CB.* ☐

7. **PLACE** *CABLE SPREAD ROOM 2 VENT FANS, 2A-SF-CB* and *2A-EF-CB* in *AUTO.* ☐

8. **PLACE** *CABLE SPREAD ROOM 1 VENT FANS, 1A-SF-CB* and *1A-EF-CB* in *AUTO.* ☐

9. **COMPLETE** Attachment 5. ☐

10. **IF** a manual initiation of the Emergency Recirculation System occurred, **THEN EXIT** this section. ☐

11. **DETERMINE** the cause of system automatic initiation **AND TAKE** the appropriate action as specified below: ☐

CAUSE	CHARCOAL EXPOSURE IMPACT	ACTION
Fire with minimum local smoke	Doubtful	1. If fire detector was reset within 15 minutes of ventilation system initiation, no action required. 2. If fire detector was not reset within 15 minutes, initiate LCO on affected train in accordance with Tech. Spec. 3.7.3, TRM 3.18 and contact Engineering for evaluation. 3. If fire exists in men's bathroom, initiate LCO on affected train in accordance with Tech. Spec. 3.7.3, TRM 3.18 and take action specified in Tech. Spec. 5.5.7.a, b, and c.2.
Fire with general dense smoke	Probable	1. Declare LCO on affected train in accordance with Tech. Spec. 3.7.3, TRM 3.18 and take action specified in Tech. Spec. 5.5.7a, b, and c.2.

5.4.2 Procedural Steps

CAUSE	CHARCOAL EXPOSURE IMPACT	ACTION
Painting less than 200 sq. ft. surface area	Doubtful	1. If fire detector was reset within 15 minutes of ventilation system initiation, no action required. 2. If fire detector was not reset within 15 minutes, initiate LCO on affected train in accordance with Tech. Spec. 3.7.3, TRM 3.18 and contact Engineering for evaluation. 3. If paint is being applied in men's bathroom and Emergency Ventilation System initiated, initiate LCO on affected train in accordance with Tech. Spec. 3.7.3, TRM 3.18 and contact Engineering for evaluation.
Localized Chemical Release (Cooking fumes, window cleaners, cleansers, tobacco smoke, metallurgical dust and fumes from welding or grinding, ozone from electrical discharge, hair spray, etc.)	Doubtful	1. If fire detector was reset within 15 minutes of ventilation system initiation, no action required. 2. If fire detector was not reset within 15 minutes, initiate LCO on affected train in accordance with Tech. Spec. 3.7.3, TRM 3.18 and contact Engineering for evaluation.
General Chemical Release (acid or alkali fumes, Halon or dry chemical fire extinguisher discharge, etc.)	Probable	1. Declare LCO on affected train in accordance with Tech. Spec. 3.7.3, TRM 3.18 and take action specified in Tech. Spec. 5.5.7a, b, and c.2.
Spurious (initiation of Emergency Ventilation System when cause is not immediately determined)	Doubtful	1. Investigate to determine if any hazards exist to cause initiation of system and, if so, take action specified above. 2. If no hazards exist and fire detector was reset, no action required. 3. If initiation is attributed to a defective fire detector and no hazards are identified, declare the defective detector impaired in accordance with 0PLP-01.2.
Painting greater than 200 sq. ft. surface	Probable	1. If fire detector was reset within 15 minutes of Emergency Ventilation System initiation, declare LCO on affected train in accordance with Tech. Spec. 3.7.3, TRM 3.18 and contact Engineering for evaluation. 2. If fire detector was not reset within 15 minutes, declare LCO on affected train in accordance with Tech. Spec. 3.7.3, TRM 3.18 and take action specified in Tech. Spec. 5.5.7a, b, and c.2. 3. If paint is being applied in men's bathroom and Emergency Ventilation System initiated, declare LCO on affected train in accordance with Tech. Spec. 3.7.3, TRM 3.18 and take action specified in Tech. Spec. 5.5.7a, b, and c.2.

5.4.2 Procedural Steps

NOTE: Engineering contact for evaluations consists of Systems Engineer, BOP Mechanical Project Engineer, or Systems Engineering Supervisor. Evaluation may dictate necessity for performing tests in accordance with Technical Specifications.

NOTE: Deviations from the requirements listed in Step 5.4.2.11 should be resolved by Technical Support Engineering personnel.

NOTE: Paint is to be considered sufficiently dried when dry to the touch. Additional surface area can then be painted.

NOTE: The requirements listed in Step 5.4.2.11 are applicable to the Control Room Ventilation System only, and are **NOT** to be used for assessment of the Reactor Building Standby Gas System.

NOTE: 200 sq. ft. surface area is based on 2000 cfm of filtered make-up air from emergency filtration system (100 sq. ft. of painted surface area per 1000 cfm filtration capacity).

a. Indicate the cause of system automatic initiation. ☐

_____

_____

b. Indicate the actions taken (utilize the guidelines provided on pages 19 through 21). ☐

_____

_____

_____

6.0 SYSTEM OPERATION

I
Information
Use

During normal operation of the Control Building Ventilation System, the following parameters should be routinely monitored.

6.1	Unit 1 and 2 conditioned areas:	Less than or equal to 75°F, 50% relative humidity
6.1.1	Control room	
6.1.2	Computer room	
6.1.3	Electronic equipment room	
6.2	Unit 1 and Unit 2 switchgear room	Less than or equal to 40°C (104°F)
6.3	Unit 1 and Unit 2 battery room	75° to 110°F
6.4	Mechanical Equipment Room	45° to 104°F

7.0 SHUTDOWN

R
Reference
Use

7.1 Control Building Ventilation System

7.1.1 Initial Conditions

1. Control Building Ventilation System is in operation in accordance with Section 5.0 or Section 8.0. ☐

2. **IF** needed, an alternate method of maintaining the switchgear area at less than 104°F should be available. ☐

3. Batteries are **NOT** being charged at the equalizing rate. ☐

7.1.2 Procedural Steps

NOTE: It may be necessary to shut down only certain Control Building ventilation components. **IF** this is the case, **THEN** only the applicable step(s) needs to be executed.

1. **PLACE** breaker in Compt. COE of MCC 2TG in *OFF* to deenergize Battery Room 2A heater. ☐

2. **PLACE** breaker in Compt. COF of MCC 2TG in *OFF* to deenergize Battery Room 2B heater. ☐

3. **STOP** *CTL ROOM AC & SUPPLY FAN, 2D-SF-CB* and *2D-CU-CB.* ☐

4. **STOP** *CABLE SPREAD ROOM 2 VENT FANS, 2A-SF-CB* and *2A-EF-CB.* ☐

5. **STOP** *BATTERY ROOM 2A VENT FANS, 2C-SF-CB* and *2C-EF-CB.* ☐

6. **STOP** *BATTERY ROOM 2B VENT FANS, 2B-SF-CB* and *2B-EF-CB.* ☐

7.1.2 Procedural Steps

7. **PLACE** breaker in Compt. COE of MCC 1TG in *OFF* to deenergize Battery Room 1A heater. ☐

8. **PLACE** breaker in Compt. COF of MCC 1TG in *OFF* to deenergize Battery Room 1B heater. ☐

9. **STOP** *CTL ROOM A/C & SUPPLY FAN, 1D-SF-CB* and *1D-CU-CB.* ☐

10. **STOP** *CABLE SPREAD ROOM 1 VENT FANS, 1A-SF-CB* and *1A-EF-CB.* ☐

11. **STOP** *BATTERY ROOM 1A VENT FANS, 1C-SF-CB* and *1C-EF-CB.* ☐

12. **STOP** *BATTERY ROOM 1B VENT FANS, 1B-SF-CB* and *1B-EF-CB.* ☐

NOTE: The Control Building Mechanical Equipment Room Vent Fans can be stopped only by simultaneously placing both Units' control switches in *OFF.*

13. **STOP** *CB MECHANICAL EQUIP ROOM VENT FANS, 2F-SF-CB* and *2E-EF-CB.* ☐

14. **STOP** *CTL ROOM A/C SPARE SUPPLY FAN, 2E-SF-CB,* if necessary. ☐

15. **STOP** *CB WASHROOM EXHAUST FAN, 2D-EF-CB.* ☐

16. **STOP** *MECHANICAL EQUIPMENT ROOM BOOSTER FAN, 1-VA-1A-BF-CB.* ☐

17. **STOP** *MECHANICAL EQUIPMENT ROOM BOOSTER FAN, 2-VA-2A-BF-CB.* ☐

8.0 INFREQUENT OPERATION

R
Reference
Use

8.1 Placing the Control Room A/C Standby Supply Fan and Air Conditioning Unit in Operation for Unit 1

8.1.1 Initial Conditions

1. Control Building Ventilation System is in operation in accordance with Section 5.1 **OR** conditions warrant placing the standby fan and air conditioning unit in operation for startup. ☐

2. *CTL ROOM A/C SPARE SUPPLY FAN, 2E-SF-CB,* is **NOT** supplying Unit 2. ☐

8.1.2 Procedural Steps

NOTE: The following controls and indications are located on Unit 1 Panel XU-3.

1. **IF** *CTL ROOM A/C & SUPPLY FAN, 1D-SF-CB* and *1D-CU-CB* are running, **THEN STOP** the fan. ☐

2. **ENSURE** discharge damper closes **AND** supply fan stops by observing the indicating light is off. ☐

3. **START** *CTL ROOM A/C SPARE SUPPLY FAN 2E-SF-CB.* ☐

4. **ENSURE** discharge damper opens **AND** supply fan starts by observing the indicating light is on. ☐

R
Reference
Use

8.2 Placing the Standby Supply Fan and Air Conditioning Unit in Operation for Unit 2

8.2.1 Initial Conditions

1. Control Building Ventilation System is in operation in accordance with Section 5.1 **OR** conditions warrant placing the standby fan and conditioning unit in operation for startup. ☐

2. *CTL ROOM A/C SPARE SUPPLY FAN, 2E-SF-CB,* is **NOT** supplying Unit 1. ☐

8.2.2 Procedural Steps

NOTE: The following controls and indications are located on Unit 2 Panel XU-3.

1. **IF** *CTL ROOM A/C & SUPPLY FAN, 2D-SF-CB* and *2D-CU-CB* are running, **THEN STOP** the fan. ☐

2. **ENSURE** discharge damper closes **AND** supply fan stops by observing the indicating light is off. ☐

3. **START** *CTL ROOM A/C SPARE SUPPLY FAN, 2E-SF-CB.* ☐

4. **ENSURE** discharge damper opens **AND** supply fan starts by observing the indicating light is on. ☐

R
Reference
Use

8.3 Placing the Preferred Unit 1 Control Room A/C Supply Fan and Air Conditioning Unit in Operation and Stopping the Standby Control Room A/C Supply Fan

8.3.1 Initial Conditions

1. Control Building Ventilation System is in operation in accordance with Section 8.1. ☐

8.3.2 Procedural Steps

NOTE: The following controls and indications are located on Unit 1 Panel XU-3.

1. **STOP** *CTL ROOM A/C SPARE SUPPLY FAN, 2E-SF-CB.* ☐

2. **ENSURE** discharge damper closes **AND** supply fan *2E-SF-CB* stops by observing the indicating light is off. ☐

3. **START** *CTL ROOM A/C & SUPPLY FAN, 1D-CU-CB* and *1D-SF-CB.* ☐

4. **ENSURE** discharge damper opens **AND** supply fan starts by observing the indicating light is on. ☐

8.4 Placing the Unit 2 Control Room A/C Supply Fan and Air Conditioning Unit in Operation and Stopping the Standby Control Room A/C Supply Fan

R
Reference
Use

8.4.1 Initial Conditions

1. Control Building Ventilation System is in operation in accordance with Section 8.2. ☐

8.4.2 Procedural Steps

NOTE: The following controls and indications are located on Unit 2 Panel XU-3.

1. **STOP** *CTL ROOM A/C SPARE SUPPLY FAN, 2E-SF-CB.* ☐

2. **ENSURE** discharge damper closes **AND** supply fan *2E-SF-CB* stops by observing the indicating light is off. ☐

3. **START** *CTL ROOM A/C & SUPPLY FAN, 2D-SF-CB* and *2D-CU-CB.* ☐

4. **ENSURE** discharge damper opens **AND** supply fan starts by observing the indicating light is on. ☐

8.5 Placing the Control Room Ventilation System in the Recirculation Mode

C
Continuous
Use

8.5.1 Initial Conditions

1. The Control Room Ventilation System is in operation in accordance with Section 5.1. ☐

2. The Control Room Ventilation System must be isolated. ☐

3. The Control Building Emergency Recirculation System is **NOT** in operation due to either of the following: ☐

   a. High Radiation condition

   b. Fire Detection condition

8.5.2 Procedural Steps

NOTE: Indications for the Control Building Ventilation System are located on Panel XU-3 on Units 1 and 2.

NOTE: Controls for the Mechanical Equipment Room Ventilation Fans and the Control Building Wash Room Exhaust Fan are on Panel XU-3 on Units 1 and 2.

NOTE: Controls and indications for the Control Building Emergency Recirculation System and Control Room Normal Makeup Air Damper are on Unit 2 Panel XU-3, while indication only is provided on Unit 1 Panel XU-3.

NOTE: Controls for the Cable Spread Room ventilation fans are on Panel XU-3 for the respective unit.

1. **ENSURE** control switches for *CB EMERG RECIRC FANS* are aligned such that one fan is in *PREF* and one fan is in *STBY.* ☐

8.5.2 Procedural Steps

2. **ENSURE** *CB EMERG RECIRC DAMPER, VA-2J-D-CB,* is closed. ☐

3. **STOP** *CABLE SPREAD ROOM 1 VENT FANS, 1A-SF-CB* and *1A-EF-CB* **AND ENSURE** their associated dampers close. ☐

4. **STOP** *CABLE SPREAD ROOM 2 VENT FANS, 2A-SF-CB* and *2A-EF-CB* **AND ENSURE** their associated dampers close. ☐

NOTE: The Control Building Mechanical Equipment Room Vent Fans can be stopped only by simultaneously placing both Units' control switches in *OFF*.

5. **STOP** *CB MECHANICAL EQUIP ROOM VENT FANS, 2F-SF-CB* and *2E-EF-CB* **AND ENSURE** their associated dampers close. ☐

6. **STOP** *CB WASHROOM EXHAUST FAN, 2D-EF-CB,* **AND ENSURE** the associated damper closes. ☐

7. **CLOSE** *CTL RM NORM MU AIR DMPR, 2L-D-CB.* ☐

8. **IF** available, **THEN ENSURE** one or more *CTL ROOM AC & SUPPLY FANS* (Unit 1, Unit 2, or spare) are running to recirculate Control Building air to maintain temperatures as comfortable as possible. ☐

NOTE: Battery Room Ventilation and Exhaust Fans are **NOT** affected by a Control Building ventilation isolation.

8.6 Recovery of Control Room Ventilation System After Being in the Recirculation Mode

C
Continuous
Use

8.6.1 Initial Conditions

1. The Control Room Ventilation System is in the Recirculation Mode in accordance with Section 8.5. ☐

2. The Control Room Ventilation System can be unisolated as determined by the Unit SCO. ☐

8.6.2 Procedural Steps

1. **PLACE** *CTL RM NORM MU AIR DMPR, 2L-D-CB,* in *AUTO.* ☐

2. **ENSURE** *CTL RM NORM MU AIR DMPR, 2L-D-CB,* indicates open **AND** *CB EMERG RECIRC DAMPER, VA-2J-D-CB,* remains closed. ☐

NOTE: The Control Building Mechanical Equipment room must be maintained above 32°F to support proper operation of the chlorine detectors.

3. **START** *CB MECHANICAL EQUIP ROOM VENT FANS, 2F-SF-CB* and *2E-EF-CB.* ☐

4. **PLACE** *CABLE SPREAD ROOM 1 VENT FANS, 1A-SF-CB* and *1A-EF-CB,* in *AUTO.* ☐

5. **PLACE** *CABLE SPREAD ROOM 2 VENT FANS, 2A-SF-CB* and *2A-EF-CB,* in *AUTO.* ☐

6. **START** *CB WASHROOM EXHAUST FAN, 2D-EF-CB.* ☐

C
Continuous
Use

8.7 Resetting Control Room Ventilation System Tornado Dampers

8.7.1 Initial Conditions

1. The Control Room Ventilation System tornado dampers have closed. ☐

2. The Control Room Ventilation System can be unisolated as determined by the Unit SCO. ☐

8.7.2 Procedural Steps

1. Restoring 1B-CV-CB to OPEN.

   a. **ENSURE** *CABLE SPREAD ROOM 1 EXHAUST FAN, 1A-EF-CB* is *OFF*. ☐

   b. **ENSURE** *BATTERY ROOM 1A EXHAUST FAN, 1C-EF-CB* is *OFF*. ☐

   c. **ENSURE** *BATTERY ROOM 1B EXHAUST FAN, 1B-EF-CB* is *OFF*. ☐

   d. **PLACE** *CONTROL SWITCH 1-VA-CS-3235* for damper *1B-CV-CB* in *RESTORE* until damper is open. ☐

   e. **PLACE** *CONTROL SWITCH 1-VA-CS-3235* for damper *1B-CV-CB* in *NEUTRAL*. ☐

   f. **START** *CABLE SPREAD ROOM 1 EXHAUST FAN, 1A-EF-CB*. ☐

   g. **START** *BATTERY ROOM 1A EXHAUST FAN, 1C-EF-CB*. ☐

   h. **START** *BATTERY ROOM 1B EXHAUST FAN, 1B-EF-CB*. ☐

8.7.2 Procedural Steps

2. Restoring 2B-CV-CB to OPEN.

   a. **ENSURE** *CABLE SPREAD ROOM 2 EXHAUST FAN, 2A-EF-CB* is *OFF*. ☐

   b. **ENSURE** *BATTERY ROOM 2A EXHAUST FAN, 2C-EF-CB* is *OFF*. ☐

   c. **ENSURE** *BATTERY ROOM 2B EXHAUST FAN, 2B-EF-CB* is *OFF*. ☐

   d. **ENSURE** *C B WASHROOM EXHAUST FAN, 2D-EF-CB* is *OFF*. ☐

   e. **PLACE** *CONTROL SWITCH 2-VA-CS-3235* for damper *2B-CV-CB* in *RESTORE* until damper is open. ☐

   f. **PLACE** *CONTROL SWITCH 2-VA-CS-3235* for damper *2B-CV-CB* in *NEUTRAL*. ☐

   g. **START** *CABLE SPREAD ROOM 2 EXHAUST FAN, 2A-EF-CB*. ☐

   h. **START** *BATTERY ROOM 2A EXHAUST FAN, 2C-EF-CB*. ☐

   i. **START** *BATTERY ROOM 2B EXHAUST FAN, 2B-EF-CB*. ☐

   j. **START** *C B WASHROOM EXHAUST FAN, 2D-EF-CB*. ☐

8.7.2 Procedural Steps

NOTE: The Control Building Ventilation Inlet Tornado Dampers 1(2)A-CV-CB should automatically re-open if the supply fans are running.

3. Restoring 1(2)A-CV-CB to OPEN.

   a. **ENSURE** appropriate Control Building Supply fans are running. ☐

   b. **IF** *1(2)A-CV-CB* have not automatically opened with the supply fans running **DISPATCH** an AO to manually open dampers from the intake plenum. ☐

Control Building Ventilation System Electrical Lineup

C
Continuous
Use

PERSON(S) PERFORMING OR VERIFYING LINEUP AND INITIALS
(PRINT)

_____ ____	_____ ____	_____ ____
_____ ____	_____ ____	_____ ____
_____ ____	_____ ____	_____ ____
_____ ____	_____ ____	_____ ____
_____ ____	_____ ____	_____ ____
_____ ____	_____ ____	_____ ____
_____ ____	_____ ____	_____ ____
_____ ____	_____ ____	_____ ____
_____ ____	_____ ____	_____ ____
_____ ____	_____ ____	_____ ____

REMARKS: **DOCUMENT** any components **NOT** in required position and reason on 0OI-01.08 Attachment. **RECORD** other comments below.

_____

_____

_____

_____

_____

_____

Started: Date _____ Time _____

Completed: Date _____ Time _____

Approved by: _____ _____ / _____
Supervisor Date Time

Control Building Ventilation System Electrical Lineup

Number	Description	Position/ Indication	Checked	Verified
Unit 1 - Control Building - 480V MCC 1CA - EL. 23'				
C32	Mechanical Equipment Room Booster Fan 1-VA-1A-BF-CB	ON		
C21	Battery Room 1A Supply Fan 1-VA-1C-SF-CB	ON		
CO4	Control Room Supply Fan 1-VA-1D-SF-CB	ON		
C18	Cable Spreading Room Exhaust Fan 1-VA-1A-EF-CB	ON		
C20	Battery Room 1A Exhaust Fan 1-VA-1C-EF-CB	ON		
C19	Cable Spreading Room Supply Fan 1-VA-1A-SF-CB	ON		
C03	Air Cooled Condenser Fan (Unit 1 Control Room Air Conditioner) 1-VA-1D-CU-CB	ON		
C16	Control Building Standby Instrument Air Compressor 2-VA-2B-AC-CB	ON		
C09	Control Building Heating Coil 1-VA-1A-EHE-CB	ON		
C27	Mechanical Equipment Room Electric Heating Unit 1-VA-1A-UH-CB	ON		
Control Building - 480V MCC 1CA - 120V Distribution Panel				
13	Battery Room 1A Supply Fan 1-VA-1C-SF-CB Motor Heater Circuit Breaker (C21)	ON		
2	Control Room Supply Fan 1-VA-1D-SF-CB Motor Heater Circuit Breaker (C04)	ON		
10	Cable Spreading Room Exhaust Fan 1-VA-1A-EF-CB Motor Heater Circuit Breaker (C18)	ON		

Control Building Ventilation System Electrical Lineup

Number	Description	Position/ Indication	Checked	Verified
Control Building - 480V MCC 1CA - 120V Distribution Panel				
12	Battery Room 1A Exhaust 1-VA-1C-EF-CB Motor Heater Circuit Breaker (C20)	ON		
11	Cable Spreading Room Supply Fan 1-VA-1A-SF-CB Motor Heater Circuit Breaker (C19)	ON		
8	Control Building Standby Instrument Air Compressor 2-VA-2B-AC-CB Motor Heater Circuit Breaker (C16)	ON		
Unit 1 - Control Building - 480 MCC 1CB - El. 23'				
C42	Battery Room 1B Exhaust Fan 1-VA-1B-EF-CB	ON		
C43	Battery Room 1B Supply Fan 1-VA-1B-SF-CB	ON		
C81	Computer Room Air Conditioning Unit 1-VA-AC-CR-CB	ON		
Control Building - 480V MCC 1CB - 120V Distribution Panel				
4	Battery Room 1B Exhaust Fan Motor Heater Circuit Breaker (C42)	ON		
5	Battery Room 1B Supply Fan 1-VA-1B-SF-CB Motor Heater Circuit Breaker (C43)	ON		
Control Building - 120V Emergency Distribution Panel 1C-HYO - El. 23'				
19	Control Building Vent Tornado Check Valves Control and Position Indication Sys. Div I.	ON		
21	Battery Room 1A Cable Spreading Room Dampers SOV 924A/928	ON		
26	Control Room Supply Fan 1-VA-1D-SF-CB, SV-1026	ON		

Control Building Ventilation System Electrical Lineup

Number	Description	Position/ Indication	Checked	Verified
Control Building - 120V Emergency Distribution Panel 1A-H06 - El. 23'				
14	Bridge Indicating Unit 1-VA-TI-1299	ON		
21	Battery Room 1A Bridge Ind Unit VA-TT-1308 to VA-TI-1308-1	ON		
Control Building - 120V Emergency Distribution Panel 1D-HY1 - El. 23'				
22	Battery Room 1B Damper SOV 925A	ON		
Control Building - 120V Emergency Distribution Panel 1B-H07 - El. 23'				
29	Battery Room 1B Bridge Ind Unit VA-TT-1309 to VA-TI-1309-1	ON		
Unit 2 - Control Building - 480V MCC 2CA - El. 23'				
C23	Control Room Emergency Recirculation Fan 2-VA-2A-ERF-CB	ON		
C03	Air Cooled Condenser Fan (Unit 2 Control Room Air Conditioner) 2-VA-2D-CU-CB	ON		
C04	Control Room Supply Fan 2-VA-2D-SF-CB	ON		
C22	Mechanical Equipment Room Exhaust Fan 2-VA-2E-EF-CB	ON		
C18	Cable Spreading Room Exhaust Fan 2-VA-2A-EF-CB	ON		
C20	Battery Room 2A Exhaust Fan 2-VA-2C-EF-CB	ON		
C19	Cable Spreading Room Supply Fan 2-VA-2A-SF-CB	ON		
C21	Battery Room 2A Supply Fan 2-VA-2C-SF-CB	ON		
C09	Control Building Heating Coil 2-VA-2A-EHE-CB	ON		

Control Building Ventilation System Electrical Lineup

Number	Description	Position/ Indication	Checked	Verified
Unit 2 - Control Building - 480V MCC 2CA - EL. 23'				
C27	Mechanical Equipment Room Electric Heating Unit 2-VA-2A-UH-CB	ON		
C16	Control Building Standby Instrument Air Compressor 2-VA-2A-AC-CB	ON		
C32	Control Building Mechanical Room Booster Fan 2-VA-2A-BF-CB	ON		
Control Building - 480V MCC 2CA - 120V Distribution Panel				
13	Battery Room 2A Supply Fan 2-VA-2C-SF-CB Motor Heater Circuit Breaker (C21)	ON		
11	Cable Spreading Room Supply Fan 2-VA-2A-SF-CB Motor Heater Circuit Breaker (C19)	ON		
2	Control Room Supply Fan 2-VA-2D-SF-CB Motor Heater Circuit Breaker (C04)	ON		
14	Mechanical Room Exhaust Fan 2-VA-2E-EF-CB Motor Heater Circuit Breaker (C22)	ON		
10	Cable Spreading Room Exhaust Fan 2-VA-2A-EF-CB Motor Heater Circuit Breaker (C18)	ON		
12	Battery Room 2A Exhaust Fan 2-VA-2C-EF-CB Motor Heater Circuit Breaker (C20)	ON		
8	Control Building Standby Instrument Air Compressor 2-VA-2A-AC-CB Motor Heater Circuit Breaker (C16)	ON		
15	Emergency Recirc Fan 2-VA-2A-ERF-CB Elapsed Time Meter	ON		

Control Building Ventilation System Electrical Lineup

Number	Description	Position/ Indication	Checked	Verified
Unit 2 - Control Building - 480V MCC 2CB - El. 23'				
C44	Control Room Emergency Recirculation Fan 2-VA-2B-ERF-CB	ON		
C58	Air Cooled Condensing Fan (Spare Control Room Air Conditioner) 2-VA-2E-CU-CB	ON		
C43	Battery Room 2B Supply Fan 2-VA-2B-SF-CB	ON		
C53	Control Building Heating Coil 2-VA-2B-EHE-CB	ON		
C59	Control Room Spare Supply Fan 2-VA-2E-SF-CB	ON		
C38	Mechanical Equipment Room Supply Fan 2-VA-2F-SF-CB	ON		
C40	Control Room Exhaust Fan 2-VA-2D-EF-CB	ON		
C42	Battery Room 2-VA-2B-EF-CB Exhaust Fan	ON		
C81	Computer Room Air Conditioning Unit 2 2-VA-2-AC-CR-CB	ON		
Control Building - 480V MCC 2CB - 120V Distribution Panel				
6	Emergency Recirc Fan 2-VA-2B-ERF-CB Elapsed Time Meter	ON		
4	Battery Room 2B Supply Fan 2-VA-2B-SF-CB Motor Heater Circuit Breaker (C42)	ON		
5	Battery Room 2B Supply Fan 2-VA-2B-SF-CB Motor Heater Circuit Breaker (C43)	ON		
15	Control Room Spare Supply Fan 2-VA-2E-SF-CB Motor Heater Circuit Breaker (C59)	ON		

Control Building Ventilation System Electrical Lineup

Number	Description	Position/ Indication	Checked	Verified
Control Building - 480V MCC 2CB - 120V Distribution Panel				
1	Mechanical Equipment Room Supply Fan 2-VA-2F-SF-CB Motor Heater Circuit Breaker (C38)	ON		
3	Control Room Exhaust Fan 2-VA-2D-EF-CB Motor Heater Circuit Breaker (C40)	ON		
Control Building - 120V Emergency Distribution Panel 2C-HY0 - El. 23'				
26	Control Room Supply Fan 2-VA-2D-SF-CB Damper SOV 1028, Mechanical Equipment Room Exhaust Damper SOV 918, Miscellaneous Power Circuit For Pressure Switch 2-VA-PSL-1646, Temperature Switch 2-VA-TSL-918, and EAF Hi-Radiation Initiation Control Power	ON		
21	Battery Room 2A Dampers SOV 926, Cable Spreading Room Dampers SOV 929	ON		
19	CB Emerg. Recirc. Fan 2A Dampers SOV 2-VA-SV-915A&C, Control Room Intake Chlorine Detectors 1X-AT-2977-1, 1X-AT-2977, CB Makeup Air Dampers SOV 2-VA-SV-916, CB Vent Tornado Check Valves Control & Pos. Ind Sys Div I.	ON		
Control Building - 120V Emergency Distribution Panel 2A-H06 - El. 23'				
14	Battery Room 2A Bridge Ind Unit VA-TT-1647 to VA-TI-1647-1, VA-TI-1299 & VA-TI-1310-2 Circuit Breaker	ON		

Control Building Ventilation System Electrical Lineup

Number	Description	Position/ Indication	Checked	Verified
Control Building - 120V Emergency Distribution Panel 2D-HY1 - El. 23'				
22	Control Building Exhaust Fan Damper SOV 917 and Battery Room 2B Exhaust Fan SOV 927A	ON		
24	Control Room Supply Fan Damper SOV 1027 and Mechanical Equipment Room Supply Fan	ON		
26	CB Emerg. Recirc. Fan 2B Dampers SOV 2-VA-SV-915B&D, Control Room Intake Chlorine Detectors 2X-AT-2977-1, 2X-AT-2977, EAF Hi Radiation Initiation Relay Ckt. Div II.	ON		
Control Building - 120V Emergency Distribution Panel 2B-H07 - El. 23'				
9	Control Building Instrument Air Dryer VA-INST-AIR-DRYER	ON		
29	Battery Room 2B Bridge Ind Unit VA-TT-1648 to VA-TI-1648-1	ON		
Control Building - Disconnect Switches - El. 70'				
1-PKO	Battery Room 1A Exhaust Fan 1-VA-1C-EF-CB	ON		
1-PJ8	Cable Spreading Room Exhaust Fan 1-VA-1A-EF-CB	ON		
1-PJ9	Battery Room 1B Exhaust Fan 1-VA-1B-EF-CB	ON		
2-NP3	Control Room Supply Fan 2-VA-2E-SF-CB	ON		
1-NP2	Control Room Supply Fan 1-VA-1D-SF-CB	ON		
1-RF5	Electric Unit Heater 1-VA-1A-UH-CB	ON		

Control Building Ventilation System Electrical Lineup

Number	Description	Position/ Indication	Checked	Verified
Control Building - Disconnect Switches - El. 70'				
1-S22	Control Building Heating Coil 1-VA-1A-EHE-CB	ON		
2-S23	Control Building Heating Coil 2-VA-2B-EHE-CB	ON		
2-S22	Control Building Heating Coil 2-VA-2A-EHE-CB	ON		
2-NP2	Control Room Supply Fan 2-VA-2D-SF-CB	ON		
2-PK2	Mechanical Equipment Room Exhaust Fan 2-VA-2E-EF-CB	ON		
2-PJ7	Mechanical Equipment Room Supply Fan 2-VA-2F-SF-CB	ON		
2-PK7	2A Emergency Recirculation Fan 2-VA-2A-ERF-CB	ON		
2-PJ8	Cable Spreading Room Exhaust Fan 2-VA-2A-EF-CB	ON		
2-PJ9	Battery Room 2B Exhaust Fan 2-VA-2B-EF-CB	ON		
2-PK8	2B Emergency Recirculation Fan 2-VA-2B-ERF-CB	ON		
2-PKO	Battery Room 2A Exhaust Fan 2-VA-2C-EF-CB	ON		
2-NG9	Control Room Exhaust Fan 2-VA-2D-EF-CB	ON		
2-RF5	Electric Unit Heater 2-VA-2A-UH-CB	ON		
2-ME2-1	Control Building Standby Instrument Air Compressor 2-VA-2B-AC-CB	ON		
2-ME2	Control Building Standby Instrument Air Compressor 2-VA-2A-AC-CB	ON		

Control Building Ventilation System Electrical Lineup

Number	Description	Position/ Indication	Checked	Verified
Control Building - Control Room - Disconnect Switches				
1-P62	Computer Room Air Handling Unit for Unit 1	ON		
2-P62	Computer Room Air Handling Unit for Unit 2	ON		
Control Building - Disconnect Switches - Above Battery Room				
2-PJ6	Battery Room 2B Supply Fan 2-VA-2B-SF-CB	ON		
2-PJ5	Battery Room 2A Supply Fan 2-VA-2C-SF-CB	ON		
2-PJ4	Cable Spreading Room Supply Fan 2-VA-2A-SF-CB	ON		
1-PJ6	Battery Room 1B Supply Fan 1-VA-1B-SF-CB	ON		
1-PJ5	Battery Room 1A Supply Fan 1-VA-1C-SF-CB	ON		
1-PJ4	Cable Spreading Room Supply Fan 1-VA-1A-SF-CB	ON		
Control Building - Control Room Roof - Disconnect Switches				
L2H #1	Computer Room Condensing Unit	ON		
L2H #2	Computer Room Condensing Unit	ON		
LIL	Control Room, Subcooling Condenser Unit 1D-SCDU-CB	OFF		
LIP	Control Room, Subcooling Condensing Unit 2E-SCDU-CB	OFF		
LIN	Control Room, Subcooling Condensing Unit 2D-SCDU-CB	OFF		
Control Building - Disconnect Switch - El. 70' - Condensing Unit Area - Panel 2-MNO				
2-MNO	Air Cooled Condensing Unit 2-VA-2D-CU-CB	ON		

Control Building Ventilation System Electrical Lineup

Number	Description	Position/ Indication	Checked	Verified
Control Building - Disconnect Switch -El. 70' - Condensing Unit Area - Panel 1-MN0				
1-MN0	Air Cooled Condensing Unit 1-VA-1D-CU-CB	ON		
Control Building - Disconnect Switch -El. 70' - Condensing Unit Area - Panel 2-MN1				
2-MN1	Air Cooled Condensing Unit 2-VA-2E-CU-CB	ON		
Turbine Building - 480V 1TG - El. 38'				
COE	Battery Room 1A Heater	ON		
COF	Battery Room 1B Heater	ON		
COL	Control Room, Subcooling Condensing Unit 1D-SCDU-CB	OFF		
COM	Control Room, Subcooling Condenser Unit 2E-SCDU-CB	OFF		
CON	Control Room, Subcooling Condenser Unit 2D-SCDU-CB	OFF		
Turbine Building - Emergency 120V AC Dist. Panel 1B-TB(H13) - El. 38' - MG Set Room				
8	Bridge Ind. Unit 1-VA-TT-1298	ON		
Turbine Building - Emergency 120V AC Dist. Panel 2B-TB(H13) - El. 38' - MG Set Room				
8	2VA-TT-1298 120V To Power Supply	ON		
Turbine Building - 480V 2TG - El. 38'				
COE	Battery Room 2A Heater	ON		
COF	Battery Room 2B Heater	ON		
Service Water Building - 120V AC Distribution Panel - 2A-SW-HQ4 El. 20' - West Wall				
5	Chlorine Loading Area Chlorine Detectors 1X-AT-2979, 1X-AT-2979-1 Div. I	ON		
Service Water Building - 120V AC Distribution Panel - 2B-SW-HQ5 El. 20' - West Wall				
4	Chlorine Loading Area Chlorine Detectors 2X-AT-2979, 2X-AT-2979-1 Div. II	ON		

ATTACHMENT 2
Page 1 of 2

Control Building Ventilation System Panel Lineup

C
Continuous
Use

PERSON(S) PERFORMING OR VERIFYING LINEUP AND INITIALS
(PRINT)

_____	____	_____	____	_____	____
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REMARKS: **DOCUMENT** any components **NOT** in required position and reason on 0OI-01.08 Attachment. **RECORD** other comments below.

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Started: Date _____ Time _____

Completed: Date _____ Time _____

Approved by: _____ _____ / _____
Supervisor Date Time

ATTACHMENT 2
Page 2 of 2

Control Building Ventilation System Panel Lineup

Number	Description	Position/ Indication	Checked	Verified
Unit 1 - Control Room - Panel XU-3				
N/A	Cable Spread Room 1 Vent Fans 1A-SF-CB and 1A-EF-CB	OFF		
N/A	Cable Spread Room 1 Vent Emerg Bypass Switch	NORMAL		
Unit 2 - Control Room - Panel XU-3				
N/A	Cable Spread Room 2 Vent Fans 2A-SF-CB and 2A-EF-CB	OFF		
N/A	Cable Spread Room 2 Vent Emerg Bypass Switch	NORMAL		
N/A	CB Stby Instr Air Compr A 2A-AC-CB	OFF		
N/A	CB Stby Instr Air Compr B 2B-AC-CB	OFF		
N/A	CB Emerg Recirc Fan A 2A-ERF-CB	PREF/ STBY*		
N/A	CB Emerg Recirc Fan B 2B-ERF-CB	STBY*/ PREF		
N/A	Ctl Rm Norm MU Air Dmpr, 2L-D-CB	AUTO		

*Ensure at least one CBEAF switch remains in preferred position.

ATTACHMENT 3
Page 1 of 12

Control Building Ventilation System Valve Lineup

C
Continuous
Use

PERSON(S) PERFORMING OR VERIFYING LINEUP AND INITIALS
(PRINT)

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REMARKS: **DOCUMENT** any components **NOT** in required position and reason on 0OI-01.08 Attachment. **RECORD** other comments below.

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Started: Date _____ Time _____

Completed: Date _____ Time _____

Approved by: _____ _____ / _____
Supervisor Date Time

Control Building Ventilation System Valve Lineup

Number	Description	Position/ Indication	Checked	Verified
Control Building - Mechanical Equipment Room - Southwest - El. 70'				
2-VA-V77	Moisture Trap Outlet Valve	OPEN		
2-VA-V79	Moisture Trap Outlet Valve	OPEN		
2-VA-V1	Receiver 2-VA-2A-AC-CB Outlet Valve	OPEN		
2-VA-V2	Receiver 2-VA-2B-AC-CB Outlet Valve	OPEN		
2-VA-V3	Receiver Discharge Header Moisture Trap Inlet Valve	OPEN		
2-VA-V4	Receiver Discharge Header Moisture Trap Inlet Valve	OPEN		
2-VA-V78	SPARE	CLOSED		
2-VA-PSL-1646-1	2-VA-PSL-1646 Instrument Isolation Valve	OPEN		
2-VA-PSL-1646-10	2-VA-PSL-1646 Instrument Test Valve	CLOSED		
2-VA-IV-2632	Instrument Air Dryer Bypass Valve	CLOSED		
2-VA-IV-2633	Aftercooler and Dryer Inlet Isolation Valve	LOCKED OPEN		
2-VA-IV-2656	Moisture Trap Outlet Valve	OPEN		
2-VA-IV-5019	Pressure Indicator 2-VA-PI-5000 Isolation Valve	OPEN		
2-VA-IV-5020	Pressure Regulator 2-VA-PV-1638A Upstream Isolation Valve	OPEN		
2-VA-IV-5021	Pressure Regulator 2-VA-PI-1638A Inlet Test Valve	CLOSED		
2-VA-IV-5022	Pressure Regulator 2-VA-PV-1638A Downstream Isolation Valve	OPEN		
2-VA-IV-5023	Pressure Regulator 2-VA-PV-1638B Upstream Isolation Valve	OPEN		

Control Building Ventilation System Valve Lineup

Number	Description	Position/ Indication	Checked	Verified
Control Building - Mechanical Equipment Room - Southwest - El. 70'				
2-VA-IV-5024	80 PSI Air Supply Flow Path A Isolation Valve	OPEN		
2-VA-IV-5025	80 PSI Air Supply Flow Path B Isolation Valve	OPEN		
2-VA-IV-5026	Pressure Regulator 2-VA-PV-1638B Inlet Test Valve	CLOSED		
2-VA-IV-5027	Pressure Regulator 2-VA-PV-1638B Downstream Isolation Valve	OPEN		
2-VA-IV-2636	Instrument Air Dryer Outlet Isolation Valve	LOCKED OPEN		
2-VA-IV-2611	EAF Damper VA-2A-EAD-CB SOV-915A Instrument Air Isolation Valve	OPEN		
2-VA-IV-2612	EAF Damper VA-2A-EAD-CB (open port) Venting Valve	CLOSED		
2-VA-IV-2613	EAF Damper VA-2A-EAD-CB (close port) Venting Valve	CLOSED		
2-VA-IV-2614	EAF Damper VA-2B-EAD-CB SOV-915B Instrument Air Isolation Valve	OPEN		
2-VA-IV-2615	EAF Damper VA-2B-EAD-CB (open port) Venting Valve	CLOSED		
2-VA-IV-2616	EAF Damper VA-2B-EAD-CB (close port) Venting Valve	CLOSED		
2-VA-IV-2617	EAF Damper VA-2C-EAD-CB SOV-915C Instrument Air Isolation Valve	OPEN		
2-VA-IV-2618	EAF Damper VA-2C-EAD-CB (open port) Venting Valve	CLOSED		
2-VA-IV-2619	EAF Damper VA-2C-EAD-CB (close port) Venting Valve	CLOSED		
2-VA-IV-2620	EAF Damper VA-2D-EAD-CB SOV-915D Instrument Air Isolation Valve	OPEN		

Control Building Ventilation System Valve Lineup

Number	Description	Position/ Indication	Checked	Verified
Control Building - Mechanical Equipment Room - Southwest - El. 70'				
2-VA-IV-2621	EAF Damper VA-2D-EAD-CB (open port) Venting Valve	CLOSED		
2-VA-IV-2622	EAF Damper VA-2C-EAD-CB (close port) Venting Valve	CLOSED		
Control Building - Mechanical Equipment Room - North - El. 70'				
2-VA-V5018*	Cooling Coil 2-VA-2B-CC-CB Circuit #1 Liquid Line Isolation Valve	OPEN		
2-VA-V5019*	Cooling Coil 2-VA-2B-CC-CB Circuit #2 Liquid Line Isolation Valve	OPEN		
2-VA-V5022*	Cooling Coil 2-VA-2B-CC-CB Circuit #1 Suction Line Isolation Valve	OPEN		
2-VA-V5023*	Cooling Coil 2-VA-2B-CC-CB Circuit #2 Suction Line Isolation Valve	OPEN		
2-VA-V5043	Cooling Coil 2-VA-2B-CC-CB Circuit #1 Liquid Line Service Valve	CLOSED		
2-VA-V5044	Cooling Coil 2-VA-2B-CC-CB Circuit #1 Suction Line Service Valve	CLOSED		
2-VA-V5045	Cooling Coil 2-VA-2B-CC-CB Circuit #1 Liquid Line Service Valve	CLOSED		
2-VA-V5046	Cooling Coil 2-VA-2B-CC-CB Circuit #1 Suction Line Service Valve	CLOSED		
2-VA-V5047	Cooling Coil 2-VA-2B-CC-CB Circuit #2 Liquid Line Service Valve	CLOSED		
2-VA-V5048	Cooling Coil 2-VA-2B-CC-CB Circuit #2 Suction Line Service Valve	CLOSED		

*Maintenance assistance will be required to remove valve cap.

Control Building Ventilation System Valve Lineup

Number	Description	Position/ Indication	Checked	Verified
Control Building - Mechanical Equipment Room - North - El. 70'				
2-VA-V5049	Cooling Coil 2-VA-2B-CC-CB Circuit #2 Liquid Line Service Valve	CLOSED		
2-VA-V5050	Cooling Coil 2-VA-2B-CC-CB Circuit #2 Suction Line Service Valve	CLOSED		
2-VA-V5051	Cooling Coil 2-VA-2B-CC-CB Circuit #1 Suction Line Service Valve	CLOSED		
2-VA-V5052	Cooling Coil 2-VA-2B-CC-CB Circuit #1 Liquid Line Service Valve	CLOSED		
2-VA-V5053	Cooling Coil 2-VA-2B-CC-CB Circuit #2 Suction Line Service Valve	CLOSED		
2-VA-V5074	Cooling Coil 2-VA-2B-CC-CB Circuit #2 Suction Line Service Valve	CLOSED		
Control Building - Mechanical Equipment Room - Northwest - El. 70'				
1-VA-V5016*	Cooling Coil 1-VA-1A-CC-CB Circuit #1 Liquid Line Isolation Valve	OPEN		
1-VA-V5017*	Cooling Coil 1-VA-1A-CC-CB Circuit #2 Liquid Line Isolation Valve	OPEN		
1-VA-V5020*	Cooling Coil 1-VA-1A-CC-CB Circuit #1 Suction Line Isolation Valve	OPEN		
1-VA-V5021*	Cooling Coil 1-VA-1A-CC-CB Circuit #2 Suction Line Isolation Valve	OPEN		
1-VA-V5040	Control Building HVAC Pressure Equalization Valve	OPEN		
1-VA-V5031	Cooling Coil 1-VA-1A-CC-CB Circuit #1 Liquid Line Service Valve	CLOSED		

*Maintenance assistance will be required to remove valve cap.

Control Building Ventilation System Valve Lineup

Number	Description	Position/ Indication	Checked	Verified
Control Building - Mechanical Equipment Room - Northwest - El. 70'				
1-VA-V5032	Cooling Coil 1-VA-1A-CC-CB Circuit #1 Suction Line Service Valve	CLOSED		
1-VA-V5033	Cooling Coil 1-VA-1A-CC-CB Circuit #1 Liquid Line Service Valve	CLOSED		
1-VA-V5034	Cooling Coil 1-VA-1A-CC-CB Circuit #1 Suction Line Service Valve	CLOSED		
1-VA-V5035	Cooling Coil 1-VA-1A-CC-CB Circuit #2 Liquid Line Service Valve	CLOSED		
1-VA-V5036	Cooling Coil 1-VA-1A-CC-CB Circuit #2 Suction Line Service Valve	CLOSED		
1-VA-V5037	Cooling Coil 1-VA-1A-CC-CB Circuit #2 Liquid Line Service Valve	CLOSED		
1-VA-V5038	Cooling Coil 1-VA-1A-CC-CB Circuit #2 Suction Line Service Valve	CLOSED		
1-VA-V5039	Cooling Coil 1-VA-1A-CC-CB Circuit #1 Suction Line Service Valve	CLOSED		
1-VA-V5043	Cooling Coil 1-VA-1A-CC-CB Circuit #1 Liquid Line Service Valve	CLOSED		
1-VA-V5041	Cooling Coil 1-VA-1A-CC-CB Circuit #2 Suction Line Service Valve	CLOSED		
1-VA-V5042	Cooling Coil 1-VA-1A-CC-CB Circuit #2 Liquid Line Service Valve	CLOSED		

Control Building Ventilation System Valve Lineup

Number	Description	Position/ Indication	Checked	Verified
Control Building - Mechanical Equipment Room - Northeast - El. 70'				
2-VA-V5016*	Cooling Coil 2-VA-2A-CC-CB Circuit #1 Liquid Line Isolation Valve	OPEN		
2-VA-V5017*	Cooling Coil 2-VA-2A-CC-CB Circuit #2 Liquid Line Isolation Valve	OPEN		
2-VA-V5020*	Cooling Coil 2-VA-2A-CC-CB Circuit #1 Suction Line Isolation Valve	OPEN		
2-VA-V5021*	Cooling Coil 2-VA-2A-CC-CB Circuit #2 Suction Line Isolation Valve	OPEN		
2-VA-V5031	Cooling Coil 2-VA-2A-CC-CB Circuit #1 Liquid Line Service Valve	CLOSED		
2-VA-V5032	Cooling Coil 2-VA-2A-CC-CB Circuit #1 Suction Line Service Valve	CLOSED		
2-VA-V5033	Cooling Coil 2-VA-2A-CC-CB Circuit #1 Liquid Line Service Valve	CLOSED		
2-VA-V5034	Cooling Coil 2-VA-2A-CC-CB Circuit #1 Liquid Line Service Valve	CLOSED		
2-VA-V5035	Cooling Coil 2-VA-2A-CC-CB Circuit #2 Liquid Line Service Valve	CLOSED		
2-VA-V5036	Cooling Coil 2-VA-2A-CC-CB Circuit #2 Suction Line Service Valve	CLOSED		
2-VA-V5037	Cooling Coil 2-VA-2A-CC-CB Circuit #2 Liquid Line Service Valve	CLOSED		

*Maintenance assistance will be required to remove valve cap.

Control Building Ventilation System Valve Lineup

Number	Description	Position/ Indication	Checked	Verified
Control Building - Mechanical Equipment Room - Northeast - El. 70'				
2-VA-V5038	Cooling Coil 2-VA-2A-CC-CB Circuit #2 Suction Line Service Valve	CLOSED		
2-VA-V5039	Cooling Coil 2-VA-2A-CC-CB Circuit #1 Suction Line Service Valve	CLOSED		
2-VA-V5040	Cooling Coil 2-VA-2A-CC-CB Circuit #1 Liquid Line Service Valve	CLOSED		
2-VA-V5041	Cooling Coil 2-VA-2A-CC-CB Circuit #2 Suction Line Service Valve	CLOSED		
2-VA-V5042	Cooling Coil 2-VA-2A-CC-CB Circuit #2 Liquid Line Service Valve	CLOSED		
Control Building - Mechanical Equipment Room - Panel 2-VA-M1-CB - El. 70'				
2-VA-V41	HDR AIR ISOL VLV for 1-VA-SV-1026A, 2-VA-SV-1027, 1028 & 2-VA-SV-1028A	OPEN		
Control Building - Mechanical Equipment Room - Panel 2-VA-M2-CB - El. 70'				
1-VA-IV-2594	U1 Primary Bypass Valve	NORMAL		
1-VA-IV-2597	U1 Secondary Isolation Valve	CLOSED		
1-VA-IV-2598	U1 Heater Controller Isolation Valve	OPEN		
1-VA-IV-2595	2-VA-ZY-1027B A/O Isolation Valve	OPEN		
2-VA-IV-2623*	2-VA-FCV-1027 Air Isolation Valve	OPEN		
2-VA-IV-2624*	2-VA-FCV-1028 Air Isolation Valve	OPEN		

*Located inside the panel

Control Building Ventilation System Valve Lineup

Number	Description	Position/ Indication	Checked	Verified
Control Building - Mechanical Equipment Room - Panel 2-VA-M2-CB - El. 70'				
2-VA-IV-2603	U2 Primary Bypass Valve	NORMAL		
2-VA-IV-2602	U2 Secondary Isolation Valve	CLOSED		
2-VA-IV-2604	U2 Heater Controller Isolation Valve	OPEN		
2-VA-IV-2600	2-VA-ZY-1027A A/O Isolation Valve	OPEN		
2-VA-IV-2599	SP Heater Controller Isolation Valve	OPEN		
2VA-IV-5028	Primary Bypass Valve for Temperature Controller TC-1027	NORMAL		
2VA-IV-5029	Secondary Isolation Valve for Temperature Controller TC-1027	CLOSED		
1-VA-IV-2610*	1-VA-FCV-1026 Air Isolation Valve	OPEN		
1-VA-IV-2611*	1-VA-FCV-1027 Air Isolation Valve	OPEN		
Control Building - Condensing Unit Area - North - El. 70'				
1-VA-V5004**	Condenser 1-VA-1D-CU-CB Circuit #1 Liquid Line Isolation Valve	OPEN		
1-VA-V5005**	Condenser 1-VA-1D-CU-CB Circuit #2 Liquid Line Isolation Valve	OPEN		
1-VA-V5044**	Condenser 1-VA-1D-CU-CB Circuit #1 Suction Line Isolation Valve	OPEN		
1-VA-V5045**	Condenser 1-VA-1D-CU-CB Circuit #1 Compressor Discharge Isolation Valve	OPEN (≥ ½ turn off backseat)		

*Located inside the panel.
**Located inside the Condensing Unit. Maintenance assistance will be required to remove access panels and/or valve cap.

Control Building Ventilation System Valve Lineup

Number	Description	Position/ Indication	Checked	Verified
Control Building - Condensing Unit Area - North - El. 70'				
1-VA-V5046**	Condenser 1-VA-1D-CU-CB Circuit #1 Liquid Line Isolation Valve	OPEN (≥ ½ turn off backseat)		
1-VA-V5047**	Condenser 1-VA-1D-CU-CB Circuit #1 Compressor A Oil Drain Valve	CLOSED		
1-VA-V5048**	Condenser 1-VA-1D-CU-CB Circuit #1 Compressor B Oil Drain Valve	CLOSED		
1-VA-V5049**	Condenser 1-VA-1D-CU-CB Circuit #2 Suction Line Isolation Valve	OPEN		
1-VA-V5050**	Condenser 1-VA-1D-CU-CB Circuit #2 Compressor Discharge Isolation Valve	OPEN (≥ ½ turn off backseat)		
1-VA-V5051**	Condenser 1-VA-1D-CU-CB Circuit #2 Liquid Line Isolation Valve	OPEN (≥ ½ turn off backseat)		
1-VA-V5052**	Condenser 1-VA-1D-CU-CB Circuit #2 Compressor A Oil Drain Valve	CLOSED		
1-VA-V5053**	Condenser 1-VA-1D-CU-CB Circuit #2 Compressor B Oil Drain Valve	CLOSED		
Control Building - Condensing Unit Area - Central - El. 70'				
2-VA-V5006**	Condenser 2-VA-2E-CU-CB Circuit #1 Liquid Line Isolation Valve	OPEN		
2-VA-V5007**	Condenser 2-VA-2E-CU-CB Circuit #2 Liquid Line Isolation Valve	OPEN		
2-VA-V5064**	Condenser 2-VA-2E-CU-CB Circuit #1 Suction Line Isolation Valve	OPEN		

**Located inside the Condensing Unit. Maintenance assistance will be required to remove access panels and/or valve cap.

Control Building Ventilation System Valve Lineup

Number	Description	Position/ Indication	Checked	Verified
Control Building - Condensing Unit Area - Central - El. 70'				
2-VA-V5065**	Condenser 2-VA-2E-CU-CB Circuit #1 Compressor Discharge Isolation Valve	OPEN (≥ ½ turn off backseat)		
2-VA-V5066**	Condenser 2-VA-2E-CU-CB Circuit #1 Liquid Line Isolation Valve	OPEN (≥ ½ turn off backseat)		
2-VA-V5067**	Condenser 2-VA-2E-CU-CB Circuit #1 Compressor A Oil Drain Valve	CLOSED		
2-VA-V5068**	Condenser 2-VA-2E-CU-CB Circuit #1 Compressor B Oil Drain Valve	CLOSED		
2-VA-V5069**	Condenser 2-VA-2E-CU-CB Circuit #2 Suction Line Isolation Valve	OPEN		
2-VA-V5070**	Condenser 2-VA-2E-CU-CB Circuit #2 Compressor Discharge Isolation Valve	OPEN (≥ ½ turn off backseat)		
2-VA-V5071**	Condenser 2-VA-2E-CU-CB Circuit #2 Liquid Line Isolation Valve	OPEN (≥ ½ turn off backseat)		
2-VA-V5072**	Condenser 2-VA-2E-CU-CB Circuit #2 Compressor A Oil Drain Valve	CLOSED		
2-VA-V5073**	Condenser 2-VA-2E-CU-CB Circuit #2 Compressor B Oil Drain Valve	CLOSED		
Control Building - Condensing Unit Area - South - El. 70'				
2-VA-V5004**	Condenser 2-VA-2D-CU-CB Circuit #1 Liquid Line Isolation Valve	OPEN		
2-VA-V5005**	Condenser 2-VA-2D-CU-CB Circuit #2 Liquid Line Isolation Valve	OPEN		

**Located inside the Condensing Unit. Maintenance assistance will be required to remove access panels and/or valve cap.

Control Building Ventilation System Valve Lineup

Number	Description	Position/ Indication	Checked	Verified
Control Building - Condensing Unit Area - South - El. 70'				
2-VA-V5054**	Condenser 2-VA-2D-CU-CB Circuit #1 Suction Line Isolation Valve	OPEN		
2-VA-V5055**	Condenser 2-VA-2D-CU-CB Circuit #1 Compressor Discharge Isolation Valve	OPEN (≥ ½ turn off backseat)		
2-VA-V5056**	Condenser 2-VA-2D-CU-CB Circuit #1 Liquid Line Isolation Valve	OPEN (≥ ½ turn off backseat)		
2-VA-V5057**	Condenser 2-VA-2D-CU-CB Circuit #1 Compressor A Oil Drain Valve	CLOSED		
2-VA-V5058**	Condenser 2-VA-2D-CU-CB Circuit #1 Compressor B Oil Drain Valve	CLOSED		
2-VA-V5059**	Condenser 2-VA-2D-CU-CB Circuit #2 Suction Line Isolation Valve	OPEN		
2-VA-V5060**	Condenser 2-VA-2D-CU-CB Circuit #2 Compressor Discharge Isolation Valve	OPEN (≥ ½ turn off backseat)		
2-VA-V5061**	Condenser 2-VA-2D-CU-CB Circuit #2 Liquid Line Isolation Valve	OPEN (≥ ½ turn off backseat)		
2-VA-V5062**	Condenser 2-VA-2D-CU-CB Circuit #2 Compressor A Oil Drain Valve	CLOSED		
2-VA-V5063**	Condenser 2-VA-2D-CU-CB Circuit #2 Compressor B Oil Drain Valve	CLOSED		

**Located inside the Condensing Unit. Maintenance assistance will be required to remove access panels and valve cap.

ATTACHMENT 4
Page 1 of 1

C
Continuous
Use

Section 5.1, Control Building Ventilation System Documentation

Number	Description	Position/ Indication	Checked	Verified
N/A	CB Stby Instr Air Compr A	AUTO		
N/A	CB Stby Instr Air Compr B	AUTO		
2A-ERF-CB	CB Emerg Recirc Fan	PREF/ STBY*		
2B-ERF-CB	CB Emerg Recirc Fan	PREF/ STBY*		

*One fan shall be in *PREF* and the remaining fan in *STBY*.

Date/Time Completed _____

Performed By (Print)	Initials
_____	_____
_____	_____
_____	_____
_____	_____

Reviewed By: _____
Unit SCO

ATTACHMENT 5
Page 1 of 1

C
Continuous
Use

Section 5.4, Placing CB Vent System in Operation Following Emerg Recirc System Initiation Documentation

Number	Description	Position/ Indication	Checked	Verified
2A-ERF-CB	CB Emerg Recirc Fan	PREF/ STBY*		
2B-ERF-CB	CB Emerg Recirc Fan	PREF/ STBY*		

*One fan shall be in *PREF* and the remaining fan in *STBY*.

Date/Time Completed _____

Performed By (Print)	Initials
_____	_____
_____	_____
_____	_____
_____	_____

Reviewed By: _____
Unit SCO

REVISION SUMMARY

Revision 42 adds note for manual startup of the CREV System, if one fan is placed in ON the other fan will not auto start upon an initiation signal.

Revision 41 deletes the Precaution and Limitation concerning a 10-hour delay after power restoration to allow crankcase heatup. This revision also adds reference to the TRM for potential actions if CB Emergency Recirculation System is inoperable.

ENCLOSURE 3

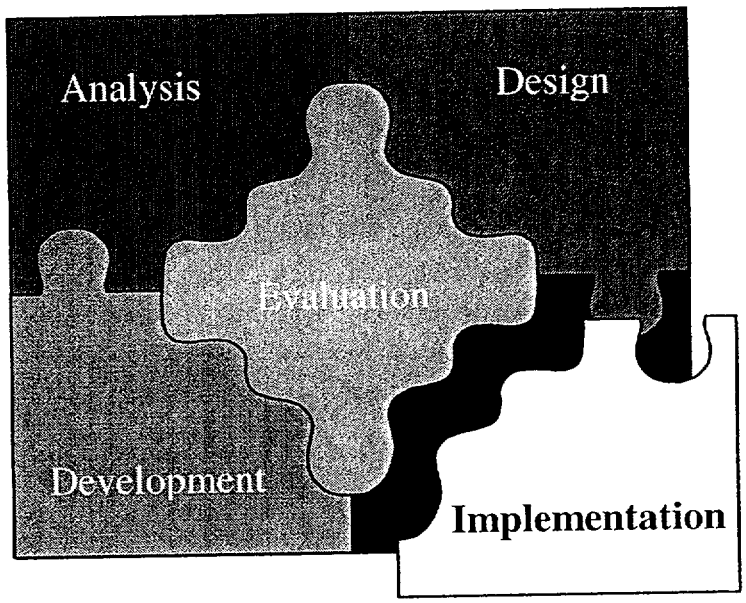
BRUNSWICK STEAM ELECTRIC PLANT, UNIT NOS. 1 AND 2
DOCKET NOS. 50-325 AND 50-324/LICENSE NOS. DPR-71 AND DPR-62
RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION - REQUEST FOR
LICENSE AMENDMENTS TO ADOPT ALTERNATIVE RADIOLOGICAL SOURCE TERM
(NRC TAC NOS. MB2570 AND MB2571)

Lesson Plan LOCT-CLS-LP-500-02-1,
"EOP Summary of Changes for EPUR"

CAROLINA POWER & LIGHT COMPANY

BRUNSWICK TRAINING SECTION

LESSON PLAN



LESSON TITLE: EOP Summary of Changes for EPUR

LESSON NUMBER: LOCT-CLS-LP-500-02-1

REVISION NO.: 0 **DURATION:** 1 hour

DEVELOPER: _____ Training Instructor — 12/13/01 Date

CONCURRENCE: _____ Line Supervisor — 12/13/01 Date

APPROVAL: _____ Training Supervisor/Superintendent — 12/13/01 Date

INSTRUCTOR MATERIALS

1. S. Boyce summary of EOP Changes for EPUR

STUDENT MATERIALS

1. Student Handout
2. Copy of Power Point Presentation

LESSON REFERENCES

1. OI-37 Series
2. 0EOP-01-NL
3. 0EOP-01-UG
4. SEPs and LEPs
5. EOPs and SAMG

LESSON PREREQUISITES

1. None

LESSON OBJECTIVES - Licensed Operators

CLS-LP-300-J (Local Emergency Procedures)

6. Given plant conditions and which steps have been completed, determine required operator actions per the applicable Local Emergency Procedure. (EOP-01-LEP-01, 02, 03)

CLS-LP-300-K (Supplemental Emergency Procedures)

19. Given a Supplemental Emergency Procedure, which steps have been completed and Plant Parameters, determine the required operator actions.

CLS-LP-300-H (AEDP)

5. Given the Alternate Emergency Depressurization Procedure, which steps have been completed and plant parameter values, determine the required operator actions.

CLS-LP-300-C (Reactor Scram Procedure)

10. Given plant conditions and the Reactor Scram Procedure, determine the required operator actions.

CLS-LP-300-D (Reactor Vessel Control Procedure)

9. Given plant conditions, the Reactor Vessel Control Procedure, and which steps have been completed, determine the required operator actions.

CLS-LP-300-E (Level Power Control Procedure)

19. Given plant conditions and the Level/Power Control Procedure, determine the required operator actions.

CLS-LP-300-F (Reactor Flooding Procedure)

9. Given the Reactor Flooding Procedure, which steps have been completed and plant parameter values, determine the required operator actions.

CLS-LP-300-N (Primary Containment Control Procedure)

11. Given the Primary Containment Control Procedure, which steps have been completed and plant parameters, determine the required operator actions.

CLS-LP-300-N (Radiation Release Control Procedure)

19. Given plant conditions and 0EOP-04-RRCP, determine the following:
    b. Required actions to be taken.

CLS-LP-300-Q (SAMG-01)

10. Given plant conditions, SAMG-01, and which steps have been completed, determine required operator actions.

CLS-LP-300-S (SAMG Support Procedures)

3. Given plant conditions, procedural actions being taken and SAMG Support procedures, determine the required operator actions.

ATTACHMENTS

1. Transparencies
2. Lab Guides
3. Student Handout
4. Plant Tours
5. Operational Experience
6. Enhanced Techniques
7. Power Point

MATERIAL	NOTES
I. Preparation A. Obtain latest revision of Power Point Presentation B. Obtain current OE information from the INPO Web Page C. Obtain latest copy of applicable Technical Specifications (if applicable) **II. Presentation** A. Introduction 1. Cover objectives with the class 2. Job Applicability Statement/Reason for Study B. Review EOP and SAMG Changes **III. Summary and Review** A. Review Objectives B. Question & Answer Period	

TRANSPARENCIES

There are no transparencies associated with this lesson plan.

LABORATORY GUIDE

There is no Laboratory Guide associated with this lesson plan.

STUDENT HANDOUT

EOP/SAMG PROCEDURE REVISION SUMMARY:

The procedures listed below include changes required for EPUR, the core reload, and outage related ESRs. Administrative type changes, and small wording changes, are not detailed below.

PROCEDURE	CHANGES
0OI-37	This revision incorporated the new Unit 1 APRM downscale value of 2%, the Unit 1 BPV full open press of 950 psig, the Unit 1 MAFP values, the Unit 1 MCFI values, and the new Unit 1 LL4 value and graph. The new Unit 1 HCTL, PSP, and MCUTL graphs were also added. Step RR-2 of the EPG was revised to replace "approaching" with "before'. Finally, the discussion for the 150 degree F temperature for the Suppression Pool was revised to account for the new temperature values calculated for Extended Power Uprate in calculation E11-0028.
0OI-37.1	Changes resulting from LEP-01, LEP-02, SEP-01, SEP-05, and AEDP changes, and the new EOP-01-SEP-11.
0OI-37.3	Changes resulting from EOP-01-RSP changes.
0OI-37.4	Changes resulting from EOP-01-RVCP changes. In addition, the discussion for Step RC/L-09 was revised to address that containment pressurization is credited with maintaining NPSH margins for Unit 1.
0OI-37.5	Changes resulting from EOP-01-LPC changes. In addition, the discussion for Steps RC/L-19 through 27, DW/T-09 through 17, and PC/P-04 through 13, were revised to address that containment pressurization is credited with maintaining NPSH margins for Unit 1.
0OI-37.6	Changes resulting from 0EOP-01-RXFP changes.
0OI-37.8	Changes resulting from 0EOP-02-PCCP changes. In addition, the discussion for Steps SP/T-01 through 04 was revised to address that containment pressurization is credited with maintaining NPSH margins for Unit 1.
0OI-37.10	Changes resulting from 0EOP-04-RRCP changes.
0EOP-01-NL	This revision incorporates the new Unit 1 BPV full open press of 950 psig, changed the wording associated with the discussions on TAF, LL4 (including a new Unit 1 graph), and LL5 to include GE14 for U1, and included the new Unit 1 MCFI values. The new Unit 1 MCUTL graph and MAFP values were also added. The new Unit 1 MDRIR

graph, APRM downscale value of 2%, PSP graph, and HCTL graphs were incorporated. Finally, the discussion for the 150 degree F temperature for the Suppression Pool was revised to account for the new temperature values calculated for Extended Power Uprate in calculation E11-0028.

0EOP-01-UG

This revision incorporates the new Unit 1 HCTL and PSP graphs, the new Unit 1 APRM downscale value of 2%, and the new EOP-01-SEP-11 required by implementation of Alternative Source Term. Note 5 was added to the Group 2 valves to denote the removal of various valves from the Group 2 isolation requirements, though they still receive a Group 2 signal. The new Unit 1 MCUTL and LL-4 graphs were also incorporated. The new Unit 1 LL-4 value of –32.5 inches was also incorporated. Attachment 7 was revised to include the new Unit 1 Unit Trip Load Shed Selector switch key. Finally, the discussions for RVCP, PCCP, and RRCP were revised to account for the new wording of the exit step for each procedure (i.e. is the procedure required to control the associated parameters).

0EOP-01-LEP-01

This revision adds the Unit Trip Load Shed Selector switches for the Heater Drain Pumps to Section 2. The switch for the pump to be started must be placed in the "DISABLED" position before the pump is started, and returned to the "ENABLED" position after the pump is stopped.

0EOP-01-LEP-01 Revision 19

Section 7 of the procedure is being deleted due to having inadequate technical guidance to allow successful completion of the activity. The use of the Condensate Transfer System (CTS) as a source of water for injection into the reactor pressure vessel has been included as a potential source of water when all other systems have failed to provide a method of injection. The section aligned the CTS header to a selected Condensate Filter Demineralizer (CFD) by opening the N (System Backwash Water Supply), Ns (Slow Backwash Water Supply Valve) and W (CFD Backwash Inlet/Precoat Outlet) valves. The water was then routed through the E (CFD Outlet Valve) to the condensate header. A pathway was aligned through a condensate booster pump, through the feedwater heater bypass valves, and reactor feedpump bypass valve through the feedwater discharge valves to the reactor pressure vessel. This flow path should have provided an injection source at a pressure of approximately 100 psig to the reactor pressure vessel. The problems associated with the flow path were:

- The E (CFD Outlet) valve could not be opened as long as the A (CFD Inlet) valve was closed.

- The W (CFD Backwash Inlet/Precoat Outlet) valve would not remain open when the E (CFD Outlet) valve was opened.

- The Hotwell Level Control Spill to Condensate Storage Tank Valve, CO-LV-1-1 is used in a manual mode to control hotwell levels during normal operation. The valve may not have been closed during a transient, which required the use of this procedure. This procedure did not have a step to ensure that the valve was closed. This could have diverted the water back to the CST instead of to the reactor pressure vessel.

In attempting to determine how the procedure should be revised, it was recognized that additional evaluation of the use of the CTS header through the CFD was needed. Therefore the current guidance in the procedure for using the CTS header is being deleted.

Additional minor changes to the procedure are being implemented at this time. They are replacement of WR/JO with WO, addition of an independent verification step for the E11-F017A(B) in section 3 step 11, deletion of approval signatures from cover page, deletion of list of effective pages, relocation of reason for revision page, and correction of page references within the procedure.

This problem with the procedure has been documented in AR 52562 and is not associated with EPUR.

0EOP-01-LEP-02 This revision changes the initial operator actions to make separate Unit 1 and Unit 2 steps for the IRM and APRM recorders. Unit 1 will no longer have the switch to swap the recorders from APRMs to IRMs. Unit 1 will monitor power on the APRMs until the IRM recorders are on scale. The IRMs must be inserted to get the recorders on scale.

0EOP-01-SEP-01 This revision incorporates the Alternative Source Term requirement to maintain the Unit 1 SGT-V8 and SGT-V9 valves as normally open valves. Separate Unit 1 and Unit 2 steps were created where necessary. The CAC-CS-4337 and 4338 override switches were deleted from Section 2 since the valves they override are not operated in this section.

0EOP-01-SEP-05 This revision incorporates the Alternative Source Term requirement to maintain the Unit 1 CAC-V152 and CAC-V153 valves as normally open valves. Separate Unit 1 and Unit 2 steps were created where necessary. A Unit 1 step was also added to ensure the reactor Building Ventilation System was in service prior to opening the Unit 1 CAC-V152 and CAC-V153 valves upon completion of the procedure.

0EOP-01-SEP-11 This is a new procedure to implement the Alternative Source Term requirement to establish a primary or alternative main steam line

leakage control pathway to the main condenser. The alternative pathway requires manual valve operation is power is not available to the required valves.

0EOP-01-AEDP — This revision added notes as required to inform the operator that the following actions would affect any established 0EOP-01-SEP-11 leakage control pathways. A step was also added to state that if the actions of Step C.6 cannot depressurize the reactor vessel, the operator is to continue in the procedure. A step was also added to reposition those valves utilized by 0EOP-01-SEP-11 to the positions required by that procedure upon completion of this procedure.

1EOP-01-RSP — This revision incorporated the new APRM downscale value of 2%, the new BPV full open press of 950 psig, a new step to go to LPC if control rod position cannot be determined, and the new IRM and APRM recorders where switching between recorders is no longer necessary.

2EOP-01-RSP — This revision incorporated the new Unit 1 APRM downscale value of 2% since this will be the value used in the simulator. This change will **not** be incorporated in the actual Unit 2 procedure revision. A new step to go to LPC if control rod position cannot be determined was also added. This revision also accounted for the new Unit 1 IRM and APRM recorders where switching between recorders is no longer necessary since this will be the condition in the simulator. This change will **not** be incorporated in the actual Unit 2 procedure revision.

1EOP-01-RVCP — This revision incorporated the new Unit 1 APRM downscale value of 2%, added a new entry condition like that on LPC of a reactor scram required by PCCP, SCCP, or RRCP, and reworded exit step RVCP-6 to ask if the procedure is required for control of reactor vessel parameters (instead of does an entry condition exists). This revision also added the Alternative Source Term requirements to initiate SLC, place the Control Building Emergency Recirculation system in service (a new hard card is being developed), and to perform 0EOP-01-SEP-11, all before existing to the SAMG procedures. The new BPV full open press of 950 psig, and a revision to Step RC/P-11 to ask if ED "is or was" required, were also incorporated.

2EOP-01-RVCP — This revision incorporated the new Unit 1 APRM downscale value of 2% since this will be the value used in the simulator. This change will **not** be incorporated in the actual Unit 2 procedure revision. A new entry condition like that on LPC of a reactor scram required by PCCP, SCCP, or RRCP, was added, with exit step RVCP-6 being reworded to ask if the procedure is required for control of reactor vessel parameters (instead of does an entry condition exists). Step RC/P-12 was revised to ask if ED "is or was" required.

1EOP-01-LPC	This revision incorporated the new Unit 1 APRM downscale value of 2%, the new BPV full open press of 950 psig, and the new Minimum Alternate Flooding Pressure values (that now agree with Unit 2).
2EOP-01-LPC	This revision incorporated the new Unit 1 APRM downscale value of 2% since this will be the value used in the simulator. There will be no actual Unit 2 procedure revision.
0EOP-01-RXFP	This revision incorporated the new Unit 1 MAFP table values that now agree with the Unit 2 values, the new Unit 1 MCFI table values, and the new Unit 1 MCUTL graph.
0EOP-02-PCCP	This revision changed the wording in exit Step PCCP-5 to ask if the procedure was required to control primary containment parameters instead of if an entry condition exists. Existing step number discrepancies were also corrected.
0EOP-04-RRCP	This revision changed exist Step RR-6 to ask if the procedure was required for control of radioactivity releases instead of if an entry condition exists. Step RR-12 and numerous steps in the lower portion of the flowchart, were reworded to replace "periodically" with "as required due to changing plant conditions". A new step (RR-27) required by the Alternative Source Term analyses was added to ensure the Control Building Emergency Recirculation System was placed in service if fuel failure is indicated. Steps RR-14 and 15, and RR/TB-03 were reworded to ensure that the entire Turbine Building Ventilation System is restarted, and not just the filtration system. Steps RR-24 through 26 were reworded to replace "approaching" with a "before" step. Table 1 was revised to delete the reference to the section of E&RC-2020 used to perform the needed calculation, and to replace "Tech Spec" with "ODCM".
0SAMG-04	This revision added words to page 17 to note that containment pressurization is credited in Unit 1 with maintaining NPSH margins. The new Unit 1 MDRIR and PSP graphs were also incorporated.
0SAMG-05	This revision added the new Unit 1 MDRIR and PSP graphs.
0SAMG-06.0	This revision added words in numerous places to note that containment pressurization is credited in Unit 1 with maintaining NPSH margins. Pages 218 through 221, and 223 were revised to include all of SAMG-01 Step PCF-RP-1 in each graphic, and delete reference to Step PCF-RP-3 since it does not exist. In addition, page 221 was revised to add a discussion of the Alternative Source Term requirement to inject SLC. Pages 227 through 234 were revised to include all of SAMG-01 Step PCF-RVP-1 in each graphic, and to delete reference to Step PCF-RVP-3 since it does not exist.

0SAMG-07	This revision incorporates changes necessary to account for the possible implementation of EOP-01-SEP-11, and its associated valve positions. A note was also added to ensure that re-entry into the Turbine Building is coordinated with the TSC and OSC. New steps were also added to ensure that those valves required to be in certain positions by EOP-01-SEP-11 are returned to those positions.
0SAMG-10	This revision incorporates the Alternative Source Term requirement to maintain the Unit 1 CAC-V152 and CAC-V153 valves as normally open valves. Separate Unit 1 and Unit 2 steps were created where necessary. A Unit 1 step was also added to ensure the reactor Building Ventilation System was in service prior to opening the Unit 1 CAC-V152 and CAC-V153 valves upon completion of the procedure.
0SAMG-12	This revision incorporates the Alternative Source Term requirement to maintain the Unit 1 SGT-V8 and SGT-V9 valves as normally open valves. Separate Unit 1 and Unit 2 steps were created where necessary. The CAC-CS-4337 and 4338 override switches were deleted from Steps 4.4 and 4.6 since the valves they override are not operated in these steps.

Along with the above procedure revisions, revisions to the Caution 1, Ctmt Limits, and level graphs aids were made. SPDS changes will also occur. BESS has been informed of the need to revise the TSG aids that they control.

PLANT TOUR

None

OPERATIONAL EXPERIENCE

None.

ENHANCED TECHNIQUES

None

POWER POINT PRESENTATIONS

None.

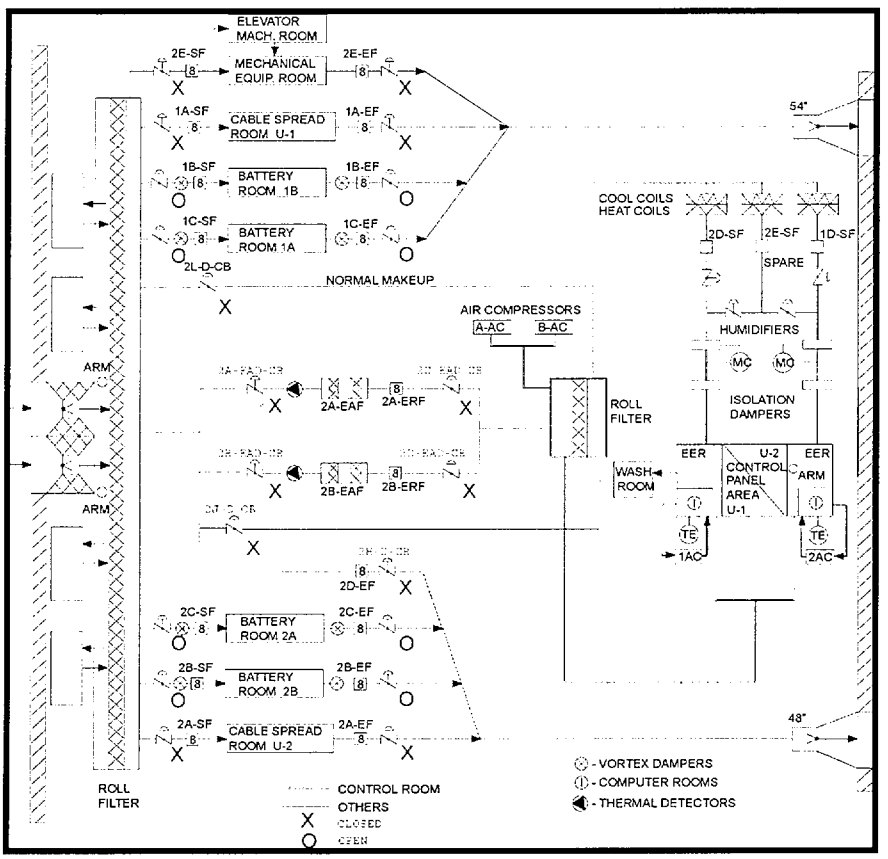
ENCLOSURE 4

BRUNSWICK STEAM ELECTRIC PLANT, UNIT NOS. 1 AND 2
DOCKET NOS. 50-325 AND 50-324/LICENSE NOS. DPR-71 AND DPR-62
RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION - REQUEST FOR LICENSE AMENDMENTS TO ADOPT ALTERNATIVE RADIOLOGICAL SOURCE TERM
(NRC TAC NOS. MB2570 AND MB2571)

System Description SD-37,
"Control Building Heating, Ventilation, and Air-Conditioning System"

CAROLINA POWER & LIGHT COMPANY
BRUNSWICK TRAINING SECTION

SYSTEM DESCRIPTION



SD-37

CONTROL BUILDING HEATING, VENTILATION, AND AIR-CONDITIONING SYSTEM

REVISION 2

Subject Matter Expert _____ _____
Date

Concurrence By _____ _____
Date

Ops Training Supervisor _____ _____
Date

REVISION SUMMARY

Revision 2 of SD-37 incorporates the following changes:

1. Included information from 0OP-37 stating "If a CREV fan is placed in ON, the non-operating fan will not automatically start upon an initiation signal."

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1.0 PURPOSE

1.1 System Purpose

The Control Building Heating, Ventilation and Air Conditioning (HVAC) System performs the following functions:

1.1.1 Maintains all occupied areas within the temperature ranges desired for human occupancy.

1.1.2 Maintains the various Control Building areas at the temperature conditions which provide for optimum operation of equipment.

1.1.3 Provides for isolation, the emergency filtration of Control Room air, and positive pressurization upon the detection of excessive radiation levels or smoke such that habitability conditions are maintained.

1.1.4 Provides for the automatic isolation of the Control Room atmosphere upon the detection of chlorine gas such that habitability conditions are maintained.

1.2 Design Basis

The Control Building Heating, Ventilation, and Air Conditioning System is designed to permit continuous occupancy of the Control Room (Habitability Envelope) under normal operating conditions and under the postulated design basis accidents including a complete rupture of the chlorine tank car throughout the life of the plant. This system is also designed to maintain optimum atmospheric conditions within the various Control Building areas for the safety of plant personnel and equipment, and to prevent the accumulation of an explosive mixture of hydrogen gas released from the plant batteries.

The HVAC equipment, controls, and ductwork supports are designed to seismic Class I and are protected by tornado-proof construction. Portions of the system are also safety related. Redundant ventilating, air conditioning, and emergency filtering equipment are provided to ensure proper environmental conditions within the Control Room, computer rooms, and the electronic workrooms.

The Control Room air conditioning subcooling system is nonsafety related. Failure of this subsystem does not affect the operability of the Control Room air conditioning condensing unit. The heat exchangers and liquid lines for the condensing units are seismically qualified/supported to prevent a seismic event from affecting the condensing unit.

1.3 General System Description

The Control Building Heating, Ventilation, and Air Conditioning System consists of individual once-through ventilation subsystems, a recirculating ventilation subsystem, and an emergency air filtering subsystem (Figure 37-1).

Redundant ventilating, air conditioning and emergency filtering equipment is provided to ensure proper environmental conditions within the Control Room, Computer Rooms, Electronic Equipment Rooms, and Electronic Workrooms.

The various system supply fans draw outside air into the Control Building through two tornado pressure check valves. The air is then filtered by the supply plenum air filter and distributed to the various ventilation subsystems.

Each Cable Spreading Room, each Battery Room, and the Mechanical Equipment Room is provided with a once-through ventilation subsystem equipped with an individual supply fan and exhaust fan. The supply fan for each subsystem takes suction from the supply plenum through a supply damper, and discharges to its associated room. The exhaust fan takes suction from the ventilated room and discharges through an exhaust damper and a tornado pressure check valve to the atmosphere outside the Control Building.

Heating for the mechanical equipment room is provided by two space heaters, one per unit. The cable spread rooms' temperature is regulated by thermostats that sense ambient air and start or stop the supply and exhaust fans to maintain the desired temperature. Temperature regulation for each of the Battery Rooms is accomplished by a temperature controlled supply duct heater and by temperature controlled vortex dampers located in the supply and exhaust ducting. The vortex dampers in the exhaust receive the same signal as the supply fan vortex dampers. Minimum air flow required to maintain less than 2% hydrogen during an equalizing battery charge is 900 scfm. Minimum air flow for proper duct heater operation is 1028 scfm. Maximum air flow during winter (15°F outside temp) for the duct heater to maintain 77°F in the Battery Rooms is 1580 scfm. Minimum air flow during summer months (93°F outside temp) to maintain less than 125°F in the Battery Rooms is 3100 scfm.

The battery rooms are normally maintained at a negative pressure relative to the Cable Spread room to prevent the exfiltration of hydrogen generated during battery equalization. The room pressure changes with net air flow, based on the positions of supply and exhaust fan vortex dampers, which are positioned by each room's thermostat. The vortex dampers are adjusted to ensure more than the minimum flow (for both hydrogen dilution and supply duct heater operation) is obtained at all times, without allowing too much flow in the winter to negate the operation of the supply duct heater. Since the exhaust fans are physically larger than the supply, the rooms are normally at a negative pressure, even though there is no requirement for room pressure (i.e., the dilution flow maintains hydrogen at concentrations below its flammable limit).

The Control Room (Recirculating) Ventilation Subsystem provides conditioned air to the Main Control Room and its associated areas (i.e., Computer Room, bathrooms, kitchen, Security CAS, and the Electronic Equipment Room). The Control Room Ventilation Subsystem make-up air and recirculated air are constantly filtered by the recirculation air filter to remove dust, smoke and other particles that may be present in the air. The nominal volume of normal make-up air (2000 cfm) sufficiently compensates for the normal exhaust (nominal 350 cfm) of the Control Room (bathroom) exhaust fan and the Control Room ex-filtration.

From the recirculation air filter, the air is routed to the air conditioning cooling coils. The Recirculating Ventilation System is equipped with three air conditioning units (one serving as a spare) capable of handling the large concentrated heat gains from the computers and electronic equipment, as well as the variable heat gains from personnel and lighting. Individual heating coils are located in the discharge ducting of each air conditioning unit cooling coil to aid in temperature control. An air cowl was installed at the inlet to the Control Building Ventilation System. The purpose of this cowling is to minimize the potential for smoke to enter the ventilation system should a fire occur in the ventilation area or control room area. Two 8'-0" x 8'-0" openings were cut in the roof above the ventilation system condensing units. The purpose of these holes is to ensure that the new Trane condensing units receive adequate air flow for the removal of heat from the refrigerant loop. These new openings are in close proximity to the existing air inlet for the Control Building Ventilation System such that there is a potential for the condensing unit exhaust air to be drawn into the ventilation system. If a fire were to develop in the condenser area the smoke from that fire could potentially be drawn back to the control room. Likewise, if the ventilation system were placed in the smoke removal mode, the exhausted smoke could also be drawn back into the ventilation system.

After conditioning, the air is directed to the suction of the three recirculating ventilation supply fans (one serves as a spare). The air discharged by the fans is routed to the Main Control Room area where it is dispersed to the various rooms. The air is then recirculated and conditioned for reuse.

0PT-23.1, Control Room Emergency Filtration System Operability Test is performed to check operability of the CBEAF System. The PT requires a minimum 15 minute run time. This ensures Tech. Spec. Surveillance Requirements are met and is also used for verification of the Run Timer accuracy (±10%). The Run Timer is used to ensure charcoal sample results are taken at required Tech. Spec. Surveillance requirements (720 hrs).

2.0 COMPONENT DESCRIPTION/DESIGN DATA

Table 37-2 is a list of the system fans and major components identifying their component number and location.

2.1 Tornado Pressure Check Valves (Dampers)

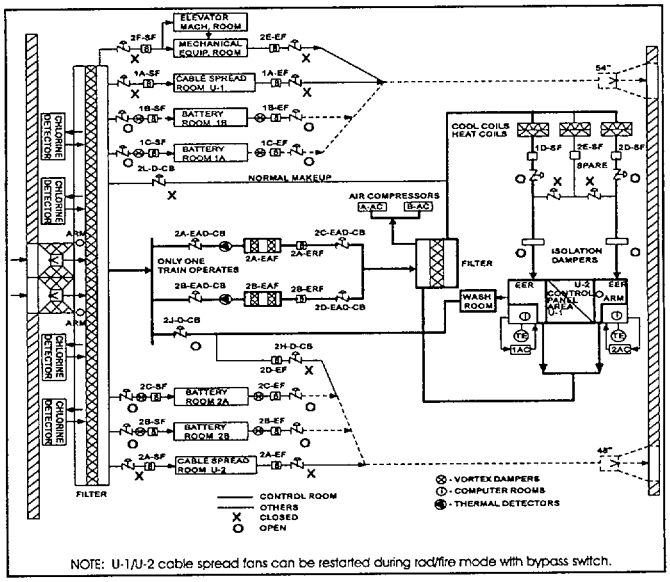
One function of the ventilation tornado pressure check valves is to protect the Control Building Heating, Ventilation, and Air Conditioning System from collapse in the event of a tornado. This is accomplished by automatic valve closure when negative pressure outside the building causes a surge evacuation of air from the building. During normal operation, the second function of the valves is to remain open to allow the passage of air. The two inlet check valves are equipped with springs which help close the valves when there is no air flow through the system. During normal operation, the ventilation fans provide sufficient air flow through the system to overcome the spring tension and open the valves to achieve the required air flow with a minimum of pressure loss through the valve. If the fans are shut down, the springs return the valves towards the closed position. In the event of a tornado during system operation, the negative pressure outside the building will reverse system air flow, opposing the ventilation fans. As this occurs, the valves are closed, preventing damage to the duct. As the tornado passes beyond the building area, the normal fan pressure reopens the valves, restoring the system to normal.

In order for the discharge check valves to accomplish their intended purpose, they must close to prevent excessive outflow under tornado conditions, but must remain open during normal operations when system air outflow is acting against the closing side of the valve. If the movement of the valve plates were not restricted, normal air discharge would cause the valve to close, thereby shutting down the system. To prevent this, the valve plates are restrained from closing by linking them to a counterweight suspended inside the valve body. During normal operation, the counterweight will hold the valve plate open, allowing normal passage of ventilation air. During a surge discharge of air, such as would occur during a tornado, the increase in flow will create drag forces on the valve plate in excess of the counterweight. This results in the closing of the valve and protects the ductwork from collapse. The discharge check valves are also equipped with equipment for remote testing. A double acting 80 psi air cylinder is attached to each counterweight to allow the weight to be lifted from the valve plate, and then restored to its normal/open position. Operation of the cylinder permits the cycling of the check valve to ensure the valve is functioning properly.

2.2 Intake Plenum and Recirculation Air Filters

The intake plenum air filter is a roll type filter, utilizing a media which consists of a continuous interlaced filter material rolled on disposable spools. The intake filter is manually advanced. The recirculating air filter is a cartridge-type filter utilized for the mechanical filtration of Control Building air. These filters utilize a filter media which consist of high density glass micro fibers laminated to a glass woven mesh backing.

2.3 Emergency Air Filter (CREV) Trains



The purpose of the two emergency air filter (Control Room Emergency Ventilation, CREV) trains is to remove smoke and/or radioactive particulate matter and iodine/methyl iodine from the Control Room atmosphere and the outdoor makeup during postulated accident or fire conditions. Each train consists of a dedicated fan, isolation dampers, high efficiency particulate absorbing (HEPA) filter, and a carbon type adsorber. During Emergency Air Filtering System operation, air enters the filter assembly through the HEPA filter. The air is then directed over the carbon adsorber as it exits the assembly. The CREV fan then directs the air to the recirculation plenum of the Control Room Subsystem.

These HEPA filters are of water repellent and fire resistant construction satisfactory for operations at temperatures up to 250°F. The filter media is glass type media designed with a filtering capacity of 99.97% for 0.3 micron particles. Each train's filter bank consists of two HEPA filters in parallel.

The function of the carbon type filters is to remove iodine, or its organic compounds, which may be contained in the Control Room or outdoor air. Each train's adsorber bank consists of six horizontal trays of granular activated carbon, impregnated as required to provide the needed iodine and methyl iodide removal efficiency. The trays are designed so that the carbon can be completely removed without destroying the integrity of the cell.

The emergency air filters are equipped with run time meters located in the Unit 2 Cable Spread Room, in the MCC compartment for the emergency recirculation fans. The tag number for the 2A fans is 2-2CA-C23-ETM and for the 2B fan is 2-2CB-C44-ETM.

2.4 Ventilation Fans

The majority of the ventilation fans contained in the Control Building Heating, Ventilation, and Air Conditioning System are identical with the exception of size and capacity. These fans are in-line, direct driven, axial flow type with the motor and fan housed within the air ducting. These fans are driven by enclosed, air-over type motors cooled by the air circulating inside the ventilation duct containing the fan unit. The booster fans for the Control Room air conditioning condenser area are belt-driven propeller type fans, while the computer room air conditioning air handlers are squirrel cage type. The ventilation fans are designed such that when the fan is started, the fan's dampers receives an OPEN signal, and when the damper's limit switch indicates OPEN, then, the fan motor receives a START signal. This ensures the fan will not start under a shutoff head (no flow) condition, which could result in damage to the fan.

2.5 Control Room Ventilation Air Conditioning Units

The recirculating ventilation air conditioning units each consist of an air cooled condensing unit, a subcooling heat exchanger/condensing unit and a direct expansion cooling coil (evaporator) assembly. The condensing units provide for the initial heat removal (cooling) of the refrigerant used in the system. This refrigerant is then directed to a subcooling heat exchanger where it can be further cooled by the refrigerant of the subcooling condensing unit. The original refrigerant is then routed to the expansion valves of the (evaporator) cooling coils located in the appropriate ventilation fan suction flowpath where the air is cooled and dehumidified prior to Control Room introduction. The cooling air for the main condensing units is provided by four fans mounted internal to each of the three units. Two booster exhaust fans are located in the condenser area to provide additional cooling for the three primary air cooled condensing units. These booster fans maintain the ambient temperature at an acceptable level for efficient condenser performance. Failure of the two booster fans does not affect operability of the condensers.

Each condensing unit includes an air-cooled subcooling condenser unit to boost the capacity of the condensing unit. The capacity of each system is increased from approximately 38 to 40 tons by cooling the liquid refrigerant in a heat exchanger served by the subcooling condensing unit. Failure of the subcooling condensing system does not affect operability of the primary condensing unit. The subcooling system is normally turned off.

2.6 Control Room Ventilation Subsystem Heating Coils

Heating coils are provided in the discharge ducting of the cooling coil assemblies for each recirculating ventilation air conditioning unit. These heating coils are operated during low temperature conditions and are controlled by their respective thermostats in the Control Room back panel areas. The individual heating coils are finned, tubular, resistance heating elements rated at 51,180 Btu/hr.

2.7 Control Building Instrument Air Compressors

Two safety related, 100% redundant instrument air compressors, complete with receiver tanks, are provided to supply the air requirements for the Control Building Heating, Ventilation, and Air Conditioning Control Air System. The compressors are belt driven by a 480 VAC, 3 phase motor and the receiver tanks are equipped with automatic drain traps. The discharged air is cooled and dried by a refrigerated air dryer which is also provided with an automatic drain trap. After the air dryer, part of the air is reduced to 20 psig and routed to the Control Air System via an air filter, while the rest is reduced to 80 psig and routed to the test cylinder of the exhaust tornado dampers and the actuators of the four isolation dampers of the Control Room Ventilation Recirculation System.

The intake air for the two instrument air compressors is taken from filters inside the return air plenum which is inside the Control Room habitability envelope. This control air is used in regulating the thermostats in the Control Room. As these thermostats cycle, instrument air is bled off. Therefore, because the instrument air is clean; radioactive or toxic gases will not be introduced into the Control Room.

2.8 Component Design Data

2.8.1 Air Cooled Condensing Units

Equipment No.	1D-CU-CB 2D-CU-CB 2E-CU-CB
Equipment Load	45.2 KW
Unit Cooling Capacity	480,000 Btu/hr
No. Of Compressors/Unit	4
Refrigerant	R-22
Power Supply	460V, 3 Phase, 60 Hz
No. Of Fans/Unit	4
CFM/Fan	28,200
Manufacturer	TRANE
Model No.	RAUCC404B

2.8.2 Subcooling Condensing Units

Equipment No.	1D-SCDU-CB 2D-SCDU-CB 2E-SCDU-CB
Entering air temp	93°F
Refrigerant	R-22
Evaporative Load/Unit	127,800 BTU/hr
Compressor Power Input	
Power Supply	460V, 3 Phase, 60 Hz
No. of fans/unit	2
System Supplier	Ellis and Watts
Condenser Manufacturer	Century Refrig. Inc.
Model No.	DS 15H2

2.8.3 Subcooling Heat Exchangers

Equipment No.	1D-HX-CB 2D-HX-CB 2E-HX-CB
Location	Mech Eq. Room El.70'0"
Entering Liquid Refrig Temp (Shell)	90°F
Leaving Liquid Refrig Temp (Shell)	40°F
Refrigerant (tube side/shell side)	R-22/R-22
Liquid Refrig Temp (tube side)	90°F
Minimum Suction Temp (tube side)	30°F
System Supplier	Ellis and Watts
Heat Exchanger Manufacturer	Dunham-Bush
Model No.	SC004481A

2.8.4 Direct Expansion Cooling Coils

Equipment No.	1A-CC-CB 2A-CC-CB 2B-CC-CB
Air Flow Per Coil	20,000 cfm
Maximum Face Velocity	575 fpm
Cooling Capacity @ 35°F evap temp	584,800 BTU/hr
Refrigerant	R-22
Manufacturer	H. K. Porter

2.8.5 Heating Elements

Equipment No.	1A-EHE-CB 2A-EHE-CB 2B-EHE-CB
Capacity Per Coil	15 kW/51,180 BTU/hr
Air Flow per Element	20,000 cfm
Power Supply	460V, 3 Phase
Manufacturer	H. K. Porter

2.8.6 Supply Air Fans for Cable Spreading Area

Equipment No.	1A-SF-CB 2A-SF-CB
Design Flow	15,500 cfm
Design System Static Pressure	3.7 inches of water
Maximum fan outlet velocity	2,600 fpm
Manufacturer	Joy Manufacturing Co.
Model No.	36-21-1750
Rated Speed	1,750 rpm
BHP	12.2
Motor Hp	15
Rated Voltage	460 Vac
Rated Frequency	60 Hz
Motor Manufacturer	Reliance Electric
Insulation Class	F

2.8.7 Exhaust Air Fans for Cable Spreading Area

Equipment No.	1A-EF-CB 2A-EF-CB
Design Flow	15,300 cfm
Design System Static Pressure	1.9 inches of H_2O
Maximum fan outlet velocity	3,500 fpm
Manufacturer	Joy Manufacturing Co.
Model No.	29-14-1750
Rated Speed	1,750 rpm
BHP	7.4
Motor Hp	10
Rated Voltage	460 Vac
Rated Frequency	60 Hz
Motor Manufacturer	Reliance Electric

2.8.8 Supply Air Fans for Control Room

Equipment No.	1D-SF-CB 2D-SF-CB 2E-SF-CB
Design Flow	20,000 cfm
Design System Static Pressure	5.6 inches of H_2O
Maximum outlet velocity	3,350 fpm
Manufacturer	Joy Manufacturing Co.
Model No.	Series 1000 38-26-1750
Rated Speed	1,750 rpm
BHP	23
Motor Hp	25
Rated Voltage	460 Vac
Rated Frequency	60 Hz
Motor Manufacturer	Reliance Electric

2.8.9 Supply Air Fans for Battery Room

Equipment No.	1B-SF-CB 2B-SF-CB 1C-SF-CB 2C-SF-CB
Design Flow	3,350 cfm
Design System Static Pressure	2.5 inches of H_2O
Maximum fan outlet velocity	1,900 fpm
Manufacturer	Joy Manufacturing Co.
Model No.	18-14-3450
Rated Speed	3,450 rpm
BHP	3.4
Motor Hp	5
Rated Voltage	460 Vac
Rated Frequency	60 Hz
Motor Manufacturer	Reliance Electric

2.8.10 Battery Room Exhaust Fans

Equipment No.	1B-EF-CB 2B-EF-CB 1C-EF-CB 2C-EF-CB
Design Flow	3,450 cfm
Design System Static Pressure	2.0 inches of H_2O
Maximum outlet velocity	1,950 fpm
Manufacturer	Joy Manufacturing Co.
Model No.	18-14-3450
Rated Speed	3,450 rpm
BHP	3.2
Motor Hp	5
Rated Voltage	460 Vac
Rated Frequency	60 Hz
Motor Manufacturer	Reliance Electric

2.8.11 Emergency Recirculation Fans

Equipment No.	2A-ERF-CB 2B-ERF-CB
Design Flow	2,000 cfm
Design System Static Pressure	5.5 inches of H_2O
Maximum outlet velocity	1,150 fpm
Manufacturer	Joy Manufacturing Co.
Model No.	18-14-1750
Rated Speed	3,450 rpm
BHP	5
Motor Hp	7.5
Rated Voltage	460 Vac
Rated Frequency	60 Hz
Motor Manufacturer	Reliance Electric

2.8.12 Mechanical Equipment Room Supply Fan

Equipment No.	2F-SF-CB
Design Flow	7,500 cfm
Design System Static Pressure	2.1 inches of H_2O
Maximum outlet velocity	2,250 fpm
Manufacturer	Joy Manufacturing Co.
Model No.	25-14-1750
Rated Speed	1,750 rpm
BHP	3.6
Motor Hp	5
Rated Voltage	460 Vac
Rated Frequency	60 Hz
Motor Manufacturer	Reliance Electric

2.8.13 Mechanical Equipment Room Exhaust Fan

Equipment No.	2E-EF-CB
Design Flow	7,500 cfm
Design System Static Pressure	0.75 inches of H_2O
Maximum outlet velocity	2,800 fpm
Manufacturer	Joy Manufacturing Co.
Model No.	834-17-1150
Rated Speed	1,150 rpm
BHP	1.8
Motor Hp	3
Rated Voltage	460 Vac
Rated Frequency	60 Hz
Motor Manufacturer	Reliance Electric

2.8.14 Control Building Exhaust Fan

Equipment No.	2D-EF-CB
Design Flow	350 cfm
Design System Static Pressure	1.1 inches of H_2O
Manufacturer	Joy Manufacturing Co.
Model No.	18-14-1750
Rated Speed	1,750 rpm
BFP	0.29
Motor Hp	1
Rated Voltage	460 Vac
Rated Frequency	60 Hz
Motor Manufacturer	Reliance Electric

2.8.15 Intake Plenum and Recirculation Air Filters

Equipment No.	2A-SAF-CB 2A-RAF-CB
Filter efficiency	80-85%

2.8.16 High Efficiency Particulate Absorbing (HEPA) Filters

Location	Mechanical Equipment Room El. 70' 0", CREV Trains
Number	2 per train
Design Flow	2,000 cfm total, 1000 per filter
Filter Efficiency	99.97% at 0.3 microns
Manufacturer	Farr Co.; Flanders Filters Inc.
Filter Media	Glass
Maximum Operating Temperature	250°F

2.8.17 Carbon Filters

Location	Mechanical Equipment Room El. 70' 0", CREV Trains
Number	6 per train
Design Flow	2,000 cfm total
Filter Efficiency	99%
Manufacturer	Farr Co.; Flanders Filters Inc.
Filter Media	Activated Carbon

2.8.18 Control Building Ventilation Tornado-Pressure Check Valves

Manufacturer: Technocheck

Equip. No.	Services	Maximum Nominal Size	Maximum Design scfm
1A-CV-CB	Air Intake	54"	26,450
2A-CV-CB	Air Intake	54"	26,450
1B-CV-CB	Air Discharge	54"	29,700
2B-CV-CB	Air Discharge	48"	23,200

2.8.19 Control Building HVAC Instrument Air Compressors

Equipment No.	2A-AC-CB 2B-AC-CB
Location	Mechanical Equipment Room El. 70' 0"
Number	2
Type	Oilless
Air receiver tank capacity	60 gallons
Developed pressure	80-100 psig
Min. and max. operating pressures	65 psig and 100 psig
Rated speed	550 rpm
Drive	Guarded V-belt
Motor Ratings	1 Hp, 480 Vac, 3 Phase, 60 Hz
Vendor	Johnson Service Company
Manufacturer	Quincy
Model No.	DJ-230-32
Serial #	2A-893992-L 2B-893993-L

2.8.20 Computer Room Handling Unit

Equipment No.	1-AHU-CR-CB 2-AHU-CR-CB
Location	Computer Room Roof El. 62'2"
Load	60,000 BTU/hr
Power Supply	460V, 3 Phase, 60 Hz
Manufacturer	Quincy
Model No.	39LB1061

2.8.21 Computer Room Condensing Units

Equipment No.	1-CDU-CR-CB 2-CDU-CR-CB
Location	Control Building Roof
Power Supply	460V, 3 Phase, 60 Hz
Manufacturer	Carrier
Model No.	38 TH 060-6

2.8.22 Chlorine Sensors

Equipment No.	1-X-AE-2977 1-X-AE-2979 1-X-AE-2977-1 1-X-AE-2979-1 2-X-AE-2977 2-X-AE-2979 2-X-AE-2977-1 2-X-AE-2979-1
Location	(2977) inside CBHVAC inlet, 70'el. (2979) outside, on West Wall of Service Water Building
Manufacturer	Rosemount
Model	521240B-23-99 XB0161-02 (2977 also have PVC weather shield, See ESR 95-682)

2.8.23 Chlorine Detectors

Equipment No.	1-X-AT-2977 1-X-AT-2979 1-X-AT-2977-1 1-X-AT-2979-1 2-X-AT-2977 2-X-AT-2979 2-X-AT-2977-1 2-X-AT-2979-1
Location	(2977) Mechanical Equipment Room El. 70' (2979) Service Water Building El. 20'
Manufacturer	Rosemount
Model	5324B-11-25-31-53-99/Add Special Quote #5286

3.0 INSTRUMENTATION AND CONTROL

Table 37-1 is a list of monitoring instrumentation and locations associated with the system. Table 37-3 is a list of the Instrument and controls setpoints which provide trip functions in the system.

3.1 Component Controls

3.1.1 Air Conditioner Condenser Area Booster Exhaust Fan

The Control Room air conditioner area booster exhaust fans are controlled by individual controllers located in the condenser area of the Mechanical Equipment Room. Each controller is provided with a two-position STOP-START, control switch and fan status indicating lights. The booster fans normally cycle on outside temperature to provide extra ventilation to the condensing and air conditioning units for increased efficiency. During low temperature winter periods, the Control Room A/C condenser area booster fans may be manually turned off to prevent cooling the condenser too much, and causing low refrigerant pressure in the A/C system.

3.1.2 Control Building Instrument Air Compressors

The Control Building instrument air compressors are controlled by individual three-position, AUTO-OFF-MAN control switches located on XU-3 panel. Selection of the MAN position initiates a manual start of the associated air compressor. In the AUTO position, the air compressor starts when its associated air receiver pressure decreases to 78 psig. The air compressor continues to operate to raise receiver pressure to 92 psig, at which time the air compressor will shut down.

3.1.3 Intake Plenum and Recirculation Air Filters

The original automatic control of the intake plenum filter is no longer functional. The recirculating filter is a cartridge-type filter. Both are manually advanced/replaced on a regular basis by Maintenance personnel.

3.1.4 Control Building Washroom Exhaust Fan

The Control Building Washroom exhaust fan is controlled by a two-position, STOP-START control switch (U-2 RTGB) and starts and stops the same as the Cable Spread Room fans. This fan will trip and its exhaust damper will close on initiation of the Emergency Air Filtration (CREV) System or after a chlorine signal.

3.1.5 Manual Operation of CREV Isolation Dampers

The CREV Emergency Air Dampers, 2-VA-2A/B/C/D-EAD-CB are equipped with Instrument Air Vent Valves which allow the instrument air line to be isolated from the dampers, then the dampers can be manually operated. Note that this operation should only be performed under an LCO with appropriate cautions given to the Control Room that the control switches to the EAF System and the automatic activation capabilities have been rendered inoperable.

3.1.6 Computer Room Split A/C System

Each computer room HVAC system is a split system that is continuously operated. There are no RTGB control switches and the system does not trip due to radiation, chlorine, or smoke signals. The units are thermostatically controlled to maintain 68°F in the computer room.

3.1.7 Smoke Removal Plan

The automatic smoke protection mode is intended to prevent smoke from a fire outside the Control Room from entering. After a fire in the Control Room, the CB HVAC System has manual smoke removal capabilities. It is detailed on drawing F-04207. When smoke buildup occurs in the Control Room envelope, the personnel doors in the Control Room and mechanical equipment room are opened. Booster fans 1/2-1/2A-BF-CB are verified to be on. The duct access doors immediately up stream from isolation dampers, 1/2-VA-ISOL-DMP-CB, are opened. The isolation dampers are closed. The Control Room supply fans force the smoke into the Mechanical Equipment Room. The negative pressure created by the booster fans draws the smoke out of the Mechanical Equipment Room. After the Control Room is free from smoke, the system is returned to its normal lineup.

NOTE: Security must be notified when this action occurs because it involves blocking open security card reader doors.

3.2 System Control

3.2.1 Control Room Area Air Conditioning

The air conditioning unit for each Unit is controlled from its respective XU-3 panel using control switches 1-VA-CS-1026 and 2-VA-CS-1028 (Units 1 and 2 respectively). The spare air conditioning unit may be controlled from either unit's XU-3 panel using control switches VA-CS-1027-1 and VA-CS-1027-2 (Units 1 and 2 respectively). Operation of each air conditioning unit is identical. The following is an operational description for the Unit 2 air conditioning unit.

The air conditioning unit and its associated supply fan are started simultaneously by the same control switch. Selecting the START position of control switch 2-VA-CS-1028 energizes solenoid valve 2-VA-SV-1028 which supplies air to the actuator of the supply fan discharge damper and to Control Room thermostat 2-VA-TC-1028. The damper fully opens actuating a limit switch to initiate the start of the supply fan and either the heater or the air conditioning unit as called for by the thermostat. The "FAN ON" indication is actuated by an air flow switch located in the fan discharge ducting.

The spare air conditioning unit may be placed in service as a replacement for either unit's air conditioning unit. Start of the spare unit can only be initiated from the XU-3 panel associated with the shutdown air conditioning unit. The spare air conditioning unit is then started in the manner previously described. Shutdown of the spare unit requires actuating both control switches simultaneously.

3.2.2 Emergency Air Filtering Trains

The emergency air filtering (CREV) trains may be operated in the automatic or manual mode. Each filter train is provided with a three position, STBY-PREF-ON, control switch (2-VA-CS-915A and 2-VA-CS-915B). Both control switches are located on the Unit 2 XU-3 Panel, with status indicating lights located on each Unit's XU-3 Panel.

1. An automatic start signal is initiated by any of the following:

   a. Any one of three Area Radiation Monitors

      (1) Control Room (Channel 1) 1 mr/hr $\pm$ .05mr increasing
      (2) Control Building Ventilation Intake (Channel 2 or 3) 7 mr/hr $\pm$ .05mr increasing

   b. Manual Fire Pull station in the Unit 1 Electronic Equipment Room

   c. Any one Ionization (smoke) detector in the Zone C4 and any one Ionization (smoke) detector in the Zone C5.

   d. Manual Fire Pull Station in the Unit 2 Electronic Equipment Room

During normal operation, one filtering train control switch is selected to the PREF (preferred) position and the second train is selected to the STBY (standby) position. The initiation of an automatic start signal places the preferred filtering train in operation.

When a start signal is received, the inlet and outlet Emergency Air Dampers on the preferred filtering train open. In the fully open position, each damper actuates a limit switch to initiate the start of the emergency recirculation fan. If the fan fails to start or trips, a start signal for the standby filtering train is initiated after a 10 second time delay. The starting sequence is identical to that of the preferred train. An air flow switch closes when sufficient air flow is reached to indicate the unit is running. The train will continue to operate until it is secured by operator action from the RTGB.

During automatic or manual EAF operation, if chlorine alarm logic, (one out of two twice) is met by the Control Building air intake plenum detectors or by the chlorine loading area (see Figure 37-4 for logic assignment) detectors the emergency recirculation fan trips and associated dampers close. If the Emergency Filtration System is not running, its logic (during a chlorine event), will prevent the Emergency Filtration Subsystem from operating automatically or manually. Shutdown of the filtering train prevents the introduction of chlorine gas into the Control Room area.

A heat (fire) detection system is incorporated into the carbon type filter of each emergency air filter. If a high temperature is detected, the filtering train automatically shuts down. If a radiation or smoke signal is present, the other train will automatically start.

The intake plenum is equipped with two area radiation monitors which are mounted on seismic pedestals in the intake plenum on the intake side of the filters. These monitors provide for radiation detection, and should detection occur the following automatic actions occur: (These same actions occur automatically upon the fire/smoke signals given above.)

- The normal intake damper (2L-D-CB) closes
- The control room washroom exhaust damper (2H-D-CB) closes and the washroom fan (2D-EF-CB) stops
- The emergency recirculation damper (2J-D-CB) opens
- The respective inlet/outlet dampers (2A/2C or 2B/2D-EAD-CB) open, and the associated CREV fan (2A or 2B-ERF-CB) starts
- The Mechanical Equipment Room supply and exhaust dampers close (2K/2T-D-CB) and fans (2F-SF/2E-EF-CB) stop
- The Cable Spread supply and exhaust dampers close (1B/2B and 1E/2E-D-CB) and fans (1A/2A-SF/EF-CB) stop

NOTE: The ventilation for the four battery rooms is not affected, nor is the recirculated air conditioning of the Main Control Room or the computer rooms.

A third area radiation monitor is located inside the Control Room. It is connected to the same logic path as the radiation monitors located in the intake plenum.

Selecting a filtering train control switch to the ON position initiates a starting sequence for the CREV fan identical to that initiated by an automatic start signal. However, a manual start does not trip the washroom fan, the mechanical equipment room fans, or the cable spread fans. The filtering train can then be shut down by selecting the PREF or STBY positions, provided an automatic start signal is not present. Also, if a CREV fan is placed in ON, the non-operating fan will not auto start upon receipt of an initiation signal.

3.2.3 Make-Up Air Dampers

During normal operation, the normal make-up air damper (2L-D-CB) is open and diverting a nominal 2000 cfm of air from the air intake plenum to the recirculation air plenum, and the emergency make-up air damper (2J-D-CB) is closed. An initiation signal (manual or automatic) to the Emergency Air Filtration System causes the normal make-up air damper to close and the emergency make-up air damper to open. This signal will also shut the washroom exhaust fan damper (2H-D-CB) thus tripping the fan (2D-EF-CB). The operation of the Emergency Makeup Damper is automatic and cannot be directly controlled by the operator. The Normal Makeup Damper and the washroom damper/fan can be closed by the operator by using control switches on XU-3.

During all modes of operation, all three of these dampers close if a high chlorine level is detected by chlorine detectors located in the Control Building ventilation intake plenum or in the area of the chlorine rail car.

3.2.4 Cable Spreading Room Ventilation

The Cable Spreading Room supply and exhaust fans are controlled from their respective XU-3 panel using two-position, OFF-AUTO, control switches (1-VA-CS-928-1 and 2-VA-CS-929-1). In addition, individual two-position, NORM-BYPASS, Cable Spread Room 1(2) Vent Emerg. Bypass key-locked control switches (1-VA-CS-1586-1 and 2-VA-CS-1586-2) are provided to allow bypassing the detected fire, radiation, or chlorine trips.

The OFF-AUTO control switch initiates the start of both the supply and exhaust fans for the associated Cable Spreading Room. Selecting the AUTO position sets up the fans to auto start on Cable Spreading Room temperature. High temperature will signal a pressure switch to energize the solenoid valve to allow instrument air to open the dampers. When the dampers are in the fully open position, per limit switches, both fans start. If a fan should fail to start or trip for any reason, its associated damper will close. The fan running indications are provided by a signal generated from an air flow switch located in the discharge ducting of each fan.

The supply and exhaust fans are automatically tripped by the following emergency conditions:

1. Abnormally high radiation levels (same signal that starts the Emergency Air Filtering System)

2. Ionization (smoke) detector or manual fire pull station for the associated Cable Spreading Room (Unit 2 also has a flame detector).

3. High chlorine level (same signal that trips the Emergency Air Filtering System).

If any of the above conditions occur, the fans may be operated by selecting the key-locked bypass switch to the BYPASS position and selecting the associated fan control switch to the AUTO position.

3.2.5 Mechanical Equipment Room Ventilation Fans

The Mechanical Equipment Room ventilation supply and exhaust fans are controlled by two-position, STOP-START control switches.

Selecting START initiates opening of a solenoid valve which allows instrument air to open the supply and exhaust dampers. When the dampers reach full open, per limit switches, the fans start. The fan running indications are provided by a signal generated from airflow switches located in the fan discharge duct. The fan trips are the same signals that trip the Cable Spreading Room fans except that the fire detection trip comes from ionization detectors or a pull station associated only with the Mechanical Equipment Room. No bypassing of the trip signals is provided. These fans are not thermostatically controlled. Fans are secured by placing both units control switch (1/2-CS-918) to STOP. During low temperature winter periods, the Mechanical Equipment Room fans may be manually secured to help the rooms unit heaters maintain the room above 32°F, as required by the chlorine detectors.

3.2.6 Battery Room Ventilation Fans

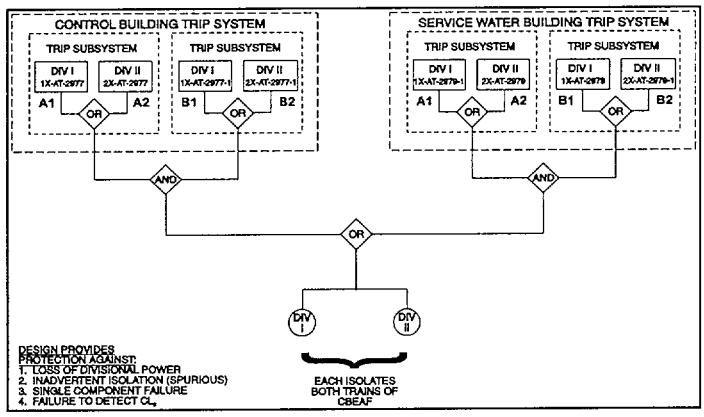
The Battery Room ventilation supply and exhaust fans are controlled by two-position, STOP-START control switches.

Operational control of the ventilation fans is identical to that of the Mechanical Equipment Room ventilation fans except that no trip exists for fire detected in the Battery Room or for Control Room radiation or chlorine signals. When the fans are operating, a room thermostat modulates the supply and exhaust vortex dampers to control room temperature. A separate room thermostat cycles the supply duct heater as needed.

3.2.7 Chlorine Isolation Mode

The CBHVAC has eight chlorine detectors, four located outside on the west wall of the Service Water Intake structure near the chlorine car, and a pair located in each of the two inlets to the CBHVAC supply plenum. As shown in Figure 37-4, the two locations (four detectors each) are defined as a trip system, with each trip system containing two trip subsystems. Each trip system is designed as one out of two, taken twice. If the trip system logic criteria for either of the Service Water building trip subsystems is met, the Chlorine Tank Car will automatically isolate. If either (or both) trip system's logic criteria is met, the following automatic actions occur:

- The normal intake damper (2L-D-CB) closes
- The Control Room washroom exhaust damper (2H-D-CB) closes and the washroom fan (2D-EF-CB) stops
- The emergency recirculation damper (2J-D-CB) closes or remains closed
- All CREV inlet/outlet dampers (2A/2C or 2B/2D-EAD-CB) close or remain closed, and the CREV fans (2A or 2B-ERF-CB) stop or are prevented from starting
- The Mechanical Equipment Room supply and exhaust dampers close (2K/2T-D-CB) and fans (2F-SF/2E-EF-CB) stop
- The Cable Spread supply and exhaust dampers close (1B/2B and 1E/2E-D-CB) and fans (1A/2A-SF/EF-CB) stop



The ventilation for the four battery rooms is not affected, nor is the recirculated air conditioning of the Main Control Room or the computer rooms. As indicated, chlorine mode overrides (and then locks out) radiation/smoke mode. The chlorine mode remains in effect until the signal is manually reset locally at the respective detectors. The two chlorine detectors in the chlorination building (1/2-X-AT-2978) provide an alarm function in the Control Room, but they do not isolate the Control Room.

4.0 SYSTEM OPERATION

4.1 Normal Operational Relationships

The system is designed to operate on a continuous basis with minimal Operator action, due to automatic control (temperature, radiation, chlorine, smoke). Within the instrument air/pneumatic controls subsystem, there are provisions for manually isolating certain components to allow maintenance work without shutting down the entire Control Room A/C subsystem.

4.1.1 Normal System Flowpaths

The normal system flowpaths provide for once through ventilation of all areas except the Control Room. These areas are both Cable Spread Rooms, all four Battery Rooms, the Mechanical Equipment Room and the Elevator Machinery Room. The ventilation air for these rooms comes from outside via two supply plenum tornado check valves, the supply plenum filter, and individual room supply dampers and fans. The air is exhausted directly outside via exhaust fans and dampers and the exhaust tornado check valves.

The Control Room Ventilation Subsystem is operated in a mode of continuous recirculation and outside air makeup such that temperature control, humidity control, and filtration can be provided. A common filter provides air to individual Control Room heating coils, cooling coils and supply fans. Air within the Control Room envelope is distributed to the Electronic Equipment Rooms, the main control panel area, the Security CAS, etc. Air is drawn from the individual rooms to a common header where it is returned to the common recirculation filter. Each Computer Room has air recirculated to its dedicated air conditioning units to aid in heat removal from these rooms. The computer room air conditioning ductwork also has manual dampers which allow some air from the Main Control Room to be cooled by the computer room air conditioning, then returned to the Main Control Room. During normal operation the Control Room outside makeup air is lost via building/system leakage and approximately 350 SCFM through the Washroom exhaust fan. Normal make-up is approximately 2000 SCFM via air conditioning fans. This difference in loss and make-up, results in a positive pressure being maintained in the Control Room. This positive pressure is a design feature, but it is not required during normal operation.

4.2 Abnormal Operation

4.2.1 System Flowpaths with Detected High Radiation or Fire

High radiation detected at the Control Building intake plenum, or in the Control Room OR smoke detected in both Control Room Electronic Equipment Rooms OR the pull station tripped in either units' Electronic Equipment Room will place the Control Room Ventilation Subsystem into a mode of FILTERED recirculation and outside makeup. In this mode, the washroom exhaust fan trips and damper closes, the emergency recirc damper opens, the normal make up damper closes, and an emergency air filtration train starts. This provides approximately 1500 SCFM of make-up air and approximately 500 SCFM of recirculated air which passes through charcoal adsorbers and is filtered via HEPA units. With the 1500 SCFM of make-up air, and leakage as the only exhaust path (normal exhaust is isolated), the Control Room is maintained at a positive pressure relative to the outdoor atmosphere. The filtration units contain charcoal for iodine removal and HEPA filters for particulate and smoke removal.

Smoke detected in, or manual pull station tripped in the Mechanical Equipment Room, either units' Cable Spread Room, or high radiation detected in the Control Building intake plenum or the Control Room causes the Mechanical Equipment Room and Cable Spread Room ventilation dampers to shut and trip the associated fans. The Cable Spreading Room fans are equipped with a bypass switch on the XU-3 panel to allow the bypassing of protective interlocks during periods of extreme emergency (high temperature in the room(s)).

The Battery Room fans are not affected by any of these signals. Neither is the Control Room air conditioning or its fans.

4.2.2 System Flowpaths with Detected Chlorine

Chlorine intrusion detected in the Control Building intake plenum or at the chlorine rail car (SW structure wall) will cause the Control Room Ventilation System to isolate all outside ductwork penetrations and operate in a strict recirculation mode until the chlorine signal can be reset. Self Contained Breathing Apparatuses (SCBAs) are located in the Control Room should this mode fail or be necessary for an extended period of time. This same chlorine intrusion signal will cause closure of the Unit 1 and Unit 2 Cable Spreading Room and the Mechanical Equipment Room ventilation dampers. This in turn will cause stopping of the associated fans. The Cable Spreading Room dampers are equipped with a bypass switch located on the XU-3 panel to allow restarting the fans with a chlorine signal present if high Cable Spread room temperatures develop.

The Battery Room fans are not affected by any of these signals. Neither is the Control Room air conditioning or its fans.

4.2.3 Control Room Emergency Ventilation

The Emergency Air Filtering System provides the additional filtering and positive pressure necessary to maintain habitable conditions within the Control Room area during emergency situations. The Emergency Air Filtering System consists of two filtering trains, each consisting of an emergency air filter and recirculation fan. One filtering train is required for system operation with the other serving as the 100% redundant standby train. For a chlorine event, the CREV does not operate. The Control Room is isolated (no positive pressure).

To restore CBHVAC after a CREV initiation, once the initiation signal is reset, the system is realigned per 0OP-37.0, which requires completion of a table to determine the effect of the run on the charcoal bed and required actions. The required actions are based on the reason for initiation and run time.

Failure of the CBHVAC System including the Emergency Filtration Train to function as required on a high radiation, fire, or chlorine alarm, could result in a Control Room evacuation and plant shutdown from outside the Control Room.

4.2.4 Control Room Air Conditioning

Control Room air temperature is required to be less than 76°F. If it exceeds 76°F, four hour trending of temperature is required. If Control Room temperature exceeds 84°F, around-the-clock troubleshooting of the Control Room HVAC System shall commence until temperature is restored within the normal band (<76°F). On a sustained loss of Control Building Ventilation (e.g Station Blackout) all Control Room backpanel cabinet doors are required to be opened. This is performed to minimize heating of the electronic equipment in these panels until the necessary emergency diesel generator crossties can be made and the Control Room A/C restarted.

4.2.5 Control Building Chlorine Isolation

The Control Room, Cable Spread Rooms, and the Mechanical Equipment Room are isolated on a chlorine signal. This design provides a Control Room which will remain habitable during a chlorine tank car rupture, allowing Operators to safely control the plant during the event. While it is desired they remain off during a chlorine release, the Cable Spread fans can be restarted if temperatures in those rooms reach their annunciator setpoints (101°F). If the Control Room chlorine protection mode is lost, Operations may have to use SCBA and/or leave the Control Room to safely operate the plant. Restoration of the CBHVAC after a chlorine isolation initiation is found in 0OP-37.

4.2.6 Battery Room Ventilation

Battery capacity and lifetime are affected by temperature. The Battery Rooms should remain above 77°F at all times. For every 3°F drop in electrolyte temperature, the specific gravity drops by one point. If the Battery Room ambient temperature is <71°F a WR/JO must be written to monitor battery cell temperatures. If the cell temperature is below 65°F a WR/JO will be required to set up emergency heating in the room. If the cell temperature drops below 60°F, the battery must be declared INOP. If the Battery Room ambient temperature is >110°F, a WR/JO must be written to obtain cell temperatures and notify the system engineer. High cell temperatures are not an operability concern and no LCO applies, but it is a battery lifetime concern.

Ventilation is required during the equalization of the batteries to prevent the generated Hydrogen gas from reaching its explosive limit. Therefore, battery room ventilation failure could impact the ability to charge/equalize the batteries, unless alternate methods of ventilation/dilution are provided.

4.3 Interrelationships With Other Systems

The Control Building HVAC Control Air System is supported by the AC and Electrical Distribution Systems. Power for major components comes from 1(2)CA and 1(2)CB [480 Vac panel fed from E5(E7) and E6(E8)]. 120 Vac power for dampers comes from 120 volt panels 1(2)A, B, C, and D (also fed from E-bus power).

The chlorine detectors at the chlorine loading area are powered from 120 Vac panels 2A-SW (Div I) and 2B-SW (Div II) (E7/E8). The chlorine detectors in the Control Building intake plenum are powered from 120 Vac panels 2C (Div I) and 2D (Div II) (2E7/2E8). If power is lost to the chlorine detectors or its logic, it will not cause a chlorine isolation (for the division that lost power). The system will also not start in the fire or radiation mode if the Fire Detection System or ARM System loses power (again, for that division).

The Control Building HVAC Control Air System is provided with two safety related instrument air compressors (powered from 1CA and 2CA). These air compressors provide control air for the HVAC pneumatic controllers. If all control air is lost, the dampers will fail to the chlorine detected mode except the EADs which fail as-is and the normal intake damper (2L-D-CB) which fails open. Also, ventilation and A/C to the Control Room will be lost. On loss of power to the solenoid valves, the Control Room isolation dampers fail closed.

5.0 RELATED INDUSTRY EVENTS

5.1 IE 82-43

IE Information Notice No. 82-43 "Deficiencies in BWR Air Filtration/Ventilation Systems" dated November 16, 1982, described deficiencies in prefilters and HEPA filters in safety-related and non-safety-related ventilation systems. It stated that these deficiencies would most likely be avoided if the systems were installed, maintained and tested in accordance with Regulatory Guides 1.52 and 1.140.

5.2 PM 79-094

Plant modification 79-094 on Unit 2 was used to add INOPERABLE annunciators to the Control Building emergency recirculation fan circuits 2A-ERF-CB and 2B-ERF-CB. The INOPERABLE annunciator signals whenever the corresponding recirculation fan is inoperable due to a loss of power to the fan or the fan overloads tripping open.

5.3 SER 11-92, Consequences of Disabled Dampers

INPO Significant Event Report (SER) 11-92 summarizes four industry events involving ventilation and fire dampers that were disabled by maintenance activities or plant modifications. The consequences of these damper mispositioning events were ventilation configurations that would not support the required operation of important plant equipment. These events are significant because disabled dampers resulted in unavailability of safety systems.

The importance of dampers, fans and other ventilation system equipment in supporting the operation of safety equipment is not always readily apparent from plant documents and drawings. Effective planning of activities that involve disabling dampers includes work area/system walkdowns and visual inspections to identify possible conflicting interactions.

Because dampers in plant ventilation and fire protection systems function similarly to valves in piping systems, the mispositioning of dampers often exhibit causal factors similar to those involving valve mispositioning. The frequency of positioning errors is significant even though initiatives have been undertaken that are intended to reduce these events. Human error continues to be the predominant cause of mispositioning events. By understanding the factors that influence human performance, improved administrative controls and personnel self-checking awareness can be utilized to prevent human error.

5.4 CBHVAC Instrument Air Dryer - Removal From Service

The BNP Control Room air conditioners tripped on 1/17/94 due to low pressure in the instrument air supply line. Pressure gauge 2-VA-PI-1636 indicated 5 psig; 20 psig is normal. This same line supplies instrument air to the Control Building HVAC dampers. LCOs A-2-94-0073 and A-1-94-0075 were initiated in accordance with Technical Specification 3.7.2 because the components of the 2A and 2B Emergency Air Filtration Systems were rendered inoperable. The CBHVAC Instrument Air Dryer, located in the 70' Mechanical Equipment Room, was isolated (valves 2-VA-IV-2633/2636) and the bypass valve opened (2-VA-IV-2632). This restored the normal instrument air supply pressure to the CBHVAC System. The above LCOs were then canceled, and tracking LCO T2-94-0079 was initiated.

The air dryer failure was found to be due to a low refrigerant charge, due to refrigerant leakage over time. This low charge reduced the temperature of the compressed air sufficiently to freeze the condensing moisture in the compressed air line, resulting in blockage of the air line. EER 94-0024 provides justification for operability of the CBHVAC when the dryer is bypassed.

5.5 Control Room A/C Subcoolers

The Control Room Subcoolers are not required to support any safety-related equipment, nor are they needed to maintain Control Room temperature/humidity below the design values (75°F, 50%). This has been verified by both calculation (0VA-0104) and by actual plant conditions (AI-117, TCF #96-058) with all three subcoolers turned off for the entire summer of 1996. Therefore, the subcoolers should be maintained off to reduce house electrical load.

6.0 REFERENCES

6.1 Technical Specifications

Applicable Technical Specifications should be referenced for requirements and bases.

6.2 Updated Final Safety Analysis Report

Section 6.4, Control Room Habitability System

Section 9.4.1, Control Building HVAC System

Section 9.5.1, Fire Protection System

Section 15.4.6, Control Rod Drop

Section 15.6.3, Main Steam Line Break

Section 15.6.4, Loss of Coolant Accident

Section 15.7.1, Fuel Handling Accident

6.3 Piping & Instrumentation Diagrams

F-04080, Control Building Air Flow Diagram

F-4081, Control Building Units 1 and 2 Air Conditioning and Ventilation Fan Elevations 23'0" and 49'0"

F-4082, Control Building Units 1 and 2 Air Conditioning and Ventilation Mechanical Equipment Room El. 70'0"

F-4083, Control Building Units 1 and 2 Sections and Details

F-4207, Fire Protection, Control Building, Ventilation and Smoke Removal System

F-04330, Control Building, Units 1 and 2 Air Conditioning and Ventilation Subcooling System Plan @ El. 70'0"

6.4 Control Wiring Diagrams

FP-04321, Control Building Ventilation Pneumatic Control Wiring Diagram (Sh. 1-6)
LL-92051, Control Wiring Diagrams, MCC 1CA
LL-9251, Control Wiring Diagrams, MCC 2CA
LL-92052, Control Wiring Diagrams, MCC 1CB
LL-9252, Control Wiring Diagrams, MCC 2CB
LL-90046 (Unit 1) P-series, Ventilation Air
LL-9046 (Unit 2) P-series, Wiring and Cable Diagrams
LL-70000 (Unit 1), Instrument Schedules "VA"
LL-7000 (Unit 2)

6.5 Modification Packages

ESR 98-00678

6.6 Procedures

0OP-37	Operating Procedure: Control Building Ventilation System
0AOP-34	Chlorine and Toxic Gas Emergencies
0AOP-36.2	Station Blackout
1(2)APPs	Annunciator Procedures
0PT-34.4.1.3	Control Building Fire Detection System Operability Test
0PT-23.1	Control Room Emergency Filtration System Operability Test
0PT-46.4	Control Building HVAC Auto Initiation
0PT-21.1	Control Building Emergency Filter System Test
0PT-17.0	Standby Gas/Control Room and Training Building Emergency Filter Weekly Run Time Check
0PT-23.1.2	Tornado-Pressure Check Damper Test
0PT-23.1.3	Control Room Emergency Filtration System Monthly Test
0PT-34.4.1.3	Control Building Fire Detection Instrumentation Operability Test

0MST-CLDET11M Chlorine Detection System Channel Function Test
0MST-CLDET21A Chlorine Detection System Channel Functional Test
0MST-CREV21R Control Room Emergency Ventilation High Radiation Channel Cal
1(2)OI-03.4.1 Unit 1(2) Control Operators Daily Check Sheets
0ENP-54 Building Ventilation Pressure Control Program
0SD-41 Fire Detection and Suppression System
0SD-11.1 Area Radiation Monitoring System

6.7 Miscellaneous

FP-4465, Control Building Emergency Air Filters, Farr Co.
FP-4317, Cooling Coil and Heating Element Modules, H. K. Porter Co.
FP-4347, Condensing Unit Instruction Manual, Carrier
FP-4190, Inline, Series 1000 Axivane Fans, Joy Mfg. Co.
FP-82376, Reliance, Electric Motors (Fans)
FP-83851, Ellis and Watts, Isolation Dampers (C.R. A/C)
FP-84708, Shan-Rod, Butterfly Dampers (CREV)
FP-81539, Johnson Controls, HVAC Controls
FP-83976, Control Building Instrument Air Compressors
FP-4417, Automatic Roll Type Filter Assembly, Continental Air Filters
FP-4370, Ventilation Check Valves for Control Building
FP-82468, American Warming and Ventilating, Inc. Dampers
FP-84181, Model 5324B Ambient Chlorine Detection System Rosemount Analytical
GEK 9693, ARM Technical Manual for CBHVAC System

7.0 TABLES

Unless otherwise noted, the attached tables and drawings are for information only. For performing actions to meet the requirements of regulations, plant license, commitments, or management directions, use the appropriate procedure, reference drawing, or print.

TABLE 37-1

Control Building Ventilation System Monitoring Instrumentation

PARAMETER INSTRUMENT FUNCTION	INSTRUMENT DESIGNATION	INDICATION/ RECORDER LOCATION
Battery Room 1A Temp.	1-VA-TI-1308-1	1-XU-3
Battery Room 1B Temp.	1-VA-TI-1309-1	1-XU-3
Battery Room 2A Temp.	2-VA-TI-1647-1	2-XU-3
Battery Room 2B Temp.	2-VA-TI-1648-1	2-XU-3
C. B. Outside Air Temp.	1-VA-TI-1310-1	1-XU-3
C. B. Outside Air Temp.	2-VA-TI-1310-2	2-XU-3
Unit 1 Control Room Air Conditioning Air Discharge Temp.	1-VA-TI-1299-1	1-XU-3
Unit 2 Control Room Air Conditioning Air Discharge Temp.	2-VA-TI-1299-2	2-XU-3
Normal Make-up Air Damper (2L) Position	2-VA-ZL-916B	2-XU-3
Emergency Make-up Air Damper (2J) Position	2-VA-ZL-916A	2-XU-3
HVAC Instrument Air Comp. Disch. Press.	2-VA-PI-1634	Local, 70' el.
HVAC Instrument Air System Pressure	2-VA-PI-1635	Local, 70' el.

NOTE: Within each of the Battery Rooms and the 70' elevation Mechanical Equipment Room, there are pneumatic panel boxes which house various components of the CBHVAC System. These panels have various pressure indicators on the face of the panel. Refer to Drawings F-04321, Shts. 1-6 for specific information as to their operation.

TABLE 37-2
Page 1 of 5
Control Building Ventilation System Major Components

COMPONENT NAME	IDENTIFICATION NUMBER*	LOCATION	POWER SUPPLY MCC - COMPT
Unit 1 Control Room Supply Air Fan	1D-SF-CB	70' Mechanical Equipment Room	1CA-C04
Unit 2 Control Room Supply Air Fan	2D-SF-CB	70' Mechanical Equipment Room	2CA-C04
Spare Control Room Supply Air Fan	2E-SF-CB	70' Mechanical Equipment Room	2CB-C59
Unit 1 Control Room Air Conditioning Unit	1D-CU-CB	70' Mechanical Equipment Room	1CA-C03
Unit 2 Control Room Air Conditioning Unit	2D-CU-CB	70' Mechanical Equipment Room	2CA-C03
Spare Control Room Air Conditioning Unit	2E-CU-CB	70' Mechanical Equipment Room	2CB-C58
Unit 1 Control Room Subcooling Air Cond. Unit	1D-SCDU-CB	Unit 2 EER Roof	1TG-COL
Unit 2 Control Room Subcooling Air Cond. Unit	2D-SCDU-CB	Unit 2 EER Roof	1TG-CON
Spare Control Room Subcooling Air Cond. Unit	2E-SCDU-CB	Unit 2 EER Roof	1TG-COM
Unit 1 Control Room Cooling Coils	1A-CC-CB	70' Mechanical Equipment Room	N/A
Unit 2 Control Room Cooling Coils	2A-CC-CB	70' Mechanical Equipment Room	N/A

TABLE 37-2
Page 2 of 5
Control Building Ventilation System Major Components

COMPONENT NAME	IDENTIFICATION NUMBER*	LOCATION	POWER SUPPLY MCC - COMPT
Spare Control Room Cooling Coils	2B-CC-CB	70' Mechanical Equipment Room	N/A
Unit 1 Control Room Electric Heaters	1A-EHE-CB	70' Mechanical Equipment Room	1CA-C09
Unit 2 Control Room Electric Heaters	2A-EHE-CB	70' Mechanical Equipment Room	2CA-C09
Spare Control Room Electric Heaters	2B-EHE-CB	70' Mechanical Equipment Room	2CB-C53
Control Room Emergency Recirculation Fan 2A	2A-ERF-CB	70' Mechanical Equipment Room	2CA-C23
Control Room Emergency Recirculation Fan 2B	2B-ERF-CB	70' Mechanical Equipment Room	2CB-C44
Control Room Emergency HEPA/Charcoal Filter 2A	2A-EAF-CB	70' Mechanical Equipment Room	N/A
Control Room Emergency HEPA/Charcoal Filter 2B	2B-EAF-CB	70' Mechanical Equipment Room	N/A
Control Building Washroom Exhaust Fan	2D-EF-CB	70' Mechanical Equipment Room	2CB-C40
Unit 1 Cable Spreading Room Supply Fan	1A-SF-CB	Above Battery Room 1A	1CA-C19

TABLE 37-2
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Control Building Ventilation System Major Components

COMPONENT NAME	IDENTIFICATION NUMBER*	LOCATION	POWER SUPPLY MCC - COMPT
Unit 2 Cable Spreading Room Supply Fan	2A-SF-CB	Above Battery Room 2A	2CA-C19
Unit 1 Cable Spreading Room Exhaust Fan	1A-EF-CB	70' Mechanical Equipment Room	1CA-C18
Unit 2 Cable Spreading Room Exhaust Fan	2A-EF-CB	70' Mechanical Equipment Room	2CA-C18
Battery Room 1A Supply Fan	1C-SF-CB	Above Battery Room 1A	1CA-C21
Battery Room 1B Supply Fan	1B-SF-CB	Above Battery Room 1B	1CB-C43
Battery Room 2A Supply Fan	2C-SF-CB	Above Battery Room 2A	2CA-C21
Battery Room 2B Supply Fan	2B-SF-CB	Above Battery Room 2B	2CB-C43
Battery Room 1A Exhaust Fan	1C-EF-CB	70' Mechanical Equipment Room	1CA-C20
Battery Room 1B Exhaust Fan	1B-EF-CB	70' Mechanical Equipment Room	1CB-C42
Battery Room 2A Exhaust Fan	2C-EF-CB	70' Mechanical Equipment Room	2CA-C20
Battery Room 2B Exhaust Fan	2B-EF-CB	70' Mechanical Equipment Room	2CB-C42
Mechanical Equipment Room Supply Fan	2F-SF-CB	70' Mechanical Equipment Room	2CB-C38

TABLE 37-2
Page 4 of 5
Control Building Ventilation System Major Components

COMPONENT NAME	IDENTIFICATION NUMBER*	LOCATION	POWER SUPPLY MCC - COMPT
Mechanical Equipment Room Exhaust Fan	2E-EF-CB	70' Mechanical Equipment Room	2CA-C22
Supply Plenum Roll Filter	2A-SAF-CB	70' Mechanical Equipment Room	N/A
Control Room Recirculation Air Filter	2A-RAF-CB	70' Mechanical Equipment Room	N/A
HVAC Instrument Air Compressor 2A	2A-AC-CB	70' Mechanical Equipment Room	2CA-C16
HVAC Instrument Air Compressor 2B	2B-AC-CB	70' Mechanical Equipment Room	1CA-C16
Unit 1 Computer Room Air Handling Unit	AHU-CR-CB	Unit 1 Computer Room Roof	1CB-C81
Unit 2 Computer Room Air Handling Unit	AHU-CR-CB	Unit 2 Computer Room Roof	2CB-C81
Unit 1 Computer Room A/C Condensing Unit	CDU-CR-CB	Unit 1 Control Room Roof	1CB-C81
Unit 2 Computer Room A/C Condensing Unit	CDU-CR-CB	Unit 2 Control Room Roof	2CB-C81
Unit 1 C.R. A/C Condensing Unit Booster Fan	1A-BF-CB	70' Mechanical Equipment Room	1CA-C32
Unit 2 C.R. A/C Condensing Unit Booster Fan	2A-BF-CB	70' Mechanical Equipment Room	2CA-C32

TABLE 37-2
Page 5 of 5
Control Building Ventilation System Major Components

COMPONENT NAME	IDENTIFICATION NUMBER*	LOCATION	POWER SUPPLY MCC - COMPT
Room Heater, Mechanical Equipment Room	1A-UH-CB	Overhead, 70' el. MER	1CA-C27
Room Heater, Mechanical Equipment Room	2A-UH-CB	Overhead, 70' el. MER	2CA-C27
Battery Room 1A Supply Duct Heater	1A-BAT-RM-HTR	Above Battery Room 1A	1TG-COE
Battery Room 1A Supply Duct Heater	1B-BAT-RM-HTR	Above Battery Room 1B	1TG-COF
Battery Room 2A Supply Duct Heater	2A-BAT-RM-HTR	Above Battery Room 2A	2TG-COE
Battery Room 2B Supply Duct Heater	2B-BAT-RM-HTR	Above Battery Room 2B	2TG-COF

* Tag numbers begin with "1-VA" or "2-VA" unless full tag given.

TABLE 37-3
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Control Building Ventilation System Instrument and Control Setpoints

PARAMETER	DESIGNATION	SETPOINT	TRIP FUNCTION
Chlorine Concentration level at Chlorine Tank Car Chlorine Concentration level at Control Building Ventilation Intake	1X-AT-2979 1X-AT-2979-1 2X-AT-2979 2X-AT-2979-1 1X-AT-2977 1X-AT-2977-1 2X-AT-2977 2X-AT-2977-1	1 ppm +/- 0.5 ppm 1ppm +/- 0.5 ppm	One-out-two taken twice logic at either or both location will cause Control Room chlorine isolation mode. Also, Control Room annunciation.
Chlorine Level in Chlorination Building	1X-AT-2978 2X-AT-2978	5ppm	Either will cause control room annunciation
HVAC Instrument Air Low Pressure	2-VA-PSL-1646	65 psig +/- 6 psig	Control Room Annunciator
HVAC Instrument Air Pressure	2-VA-PS-1632	78 psig +/- 6 psig	Start compressor 2A
HVAC Instrument Air Pressure	2-VA-PS-1633	78 psig +/- 6 psig	Start compressor 2B
Control Room High Rad. Level	ARM Channel 1	1 mr/hr +/- 0.05 mr/hr	Initiate Emergency Recirculation
Intake Plenum High Radiation	ARM Channel 2 ARM Channel 3	7 mr/hr +/- 0.05 mr/hr	Either will initiate Emergency Recirculation
Ionization Det. or Man. Pull station	Electronic Equip. Rooms (Zone 4/5)	Combustion Products	2 Detectors will initiate Emergency Recirculation
Ionization Det. or Man. Pull station	Unit 1 Cable Spread Room	Combustion Products	Trip 1A Supply and Exhaust Fans
Ionization/Flame Det. or Pull station	Unit 2 Cable Spread Room	Combustion Prod. or Flame	Trip 2A Supply and Exhaust Fans

TABLE 37-3
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Control Building Ventilation System Instrument and Control Setpoints

PARAMETER	DESIGNATION	SETPOINT	TRIP FUNCTION
Ionization Det. or Man. Pull station	Mechanical Equipment Room	Combustion Products	Trip Supply and Exhaust Fans
Thermal Detector (Any 1 of 4)	Emergency Air Filters	200°F	Trip affected Emerg. Recirculation Fan
Mechanical Equipment Room Temp.	2-VA-TSL-918	45°F	Annunciators in Control Room
Unit 2 Cable Spread Room Temp	TS-5978	101°F	Annunciators in Control Room
Unit 1 Cable Spread Room Temp	TS-5978	101°F	Annunciators in Control Room

NOTE: Typical design for the fan circuits is a flow switch provides RED/GREEN indication on the RTGB (setpoint is variable to provide indication). The exceptions are the battery room circuits, where the RED/GREEN indication (and fan trip annunciator) are based on the respective motor 42 devices being open or closed.

TABLE 37-4
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Control Building Ventilation System Annunciators

ANNUNCIATOR	UNIT(S)	WINDOW NUMBER
CB EMERGENCY RECIRC FAN 2A INOP	2	UA-5/5-6
CB EMERGENCY RECIRC FAN 2B INOP	2	UA-5/6-6
UNIT 1 CB SPLY AIR FAN OVLD TRIP	1	UA-14/1-1
CB SPARE SPLY AIR FAN OVLD TRIP	1 and 2	UA-14/1-2
UNIT 2 CB SPLY AIR FAN OVLD TRIP	2	UA-14/1-3
UNIT 1 CABLE ROOM VENT FAN OVLD TRIP	1	UA-14/2-1
EMERG AIR FAN FAIL TO RUN	1 and 2	UA-14/2-2
UNIT 2 CABLE ROOM VENT FAN OVLD TRIP	2	UA-14/2-3
BATT RM 1A VENT FAN TRIP	1	UA-14/3-1
CB EXH FAN OVLD TRIP	1 and 2	UA-14/3-2
BATT RM 2A VENT FAN TRIP	2	UA-14/3-3
BATT RM 1B VENT FAN TRIP	1	UA-14/4-1
CB MACH ROOM VENT FAN TRIP	1 and 2	UA-14/4-2
BATT RM 2B VENT FAN TRIP	2	UA-14/4-3
CB MACH ROOM TEMP - LOW	1 and 2	UA-14/5-2
CB INSTR AIR PRESS - LOW	1 and 2	UA-14/6-2

TABLE 37-4
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Control Building Ventilation System Annunciators

ANNUNCIATOR	UNIT(S)	WINDOW NUMBER
CB MECH RM BSTR FAN FAIL 1A-BF-CB	1	UA-14/2-3
CB MECH RM BSTR FAN FAIL 1A-BF-CB	2	UA-14/2-1
CB MECH RM BSTR FAN FAIL 2A-BF-CB	2	UA-14/1-1
CB MECH RM BSTR FAN FAIL 2A-BF-CB	1	UA-14/1-3
FIRE CONTROL BLDG COMPUTER NO 1	0	UA-27/1-7
FIRE CONTROL BLDG BATTERY 1A	0	UA-27/1-8
FIRE CONTROL BLDG COMPUTER NO 2	0	UA-27/2-7
FIRE CONTROL BLDG BATTERY 1B	0	UA-27/2-8
FIRE CONTROL BLDG UNIT 2 EER	0	UA-27/3-7
FIRE CONTROL BLDG BATTERY 2A	0	UA-27/3-8
FIRE CONTROL BLDG UNIT 1 EER	0	UA-27/4-7
FIRE CONTROL BLDG BATTERY 2B	0	UA-27/4-8
FIRE CONTROL BLDG CABLE AREA 1	0	UA-27/5-7
FIRE CONTROL BLDG CONTROL ROOM	0	UA-27/5-8
FIRE CONTROL BLDG ELEV 70' MECH ROOM	0	UA-27/6-6
FIRE CONTROL BLDG CABLE AREA 2	0	UA-27/6-7

TABLE 37-4
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Control Building Ventilation System Annunciators

ANNUNCIATOR	UNIT(S)	WINDOW NUMBER
TROUBLE CONTROL BLDG FIRE DET	0	UA-27/6-8
FIRE HVAC RM CONTROL BLDG CHAR FILT	0	UA-37/5-1
CHLORINE DETECTOR TROUBLE	1 and 2	UA-28/4-2
CTL ROOM INTAKE AIR HI CHLORINE	1 and 2	UA-28/5-1
CHLORINATION BLDG HI CHLORINE	1 and 2	UA-28/5-2
CHLORINE LOADING AREA HI CHLORINE	1 and 2	UA-28/6-2
CABLE SPREAD AREA HI TEMP	2	UA-14/3-1
CABLE SPREAD AREA HI TEMP	1	UA-14/3-3

FIGURE 37-1

Control Building Ventilation System : Normal Flowpaths

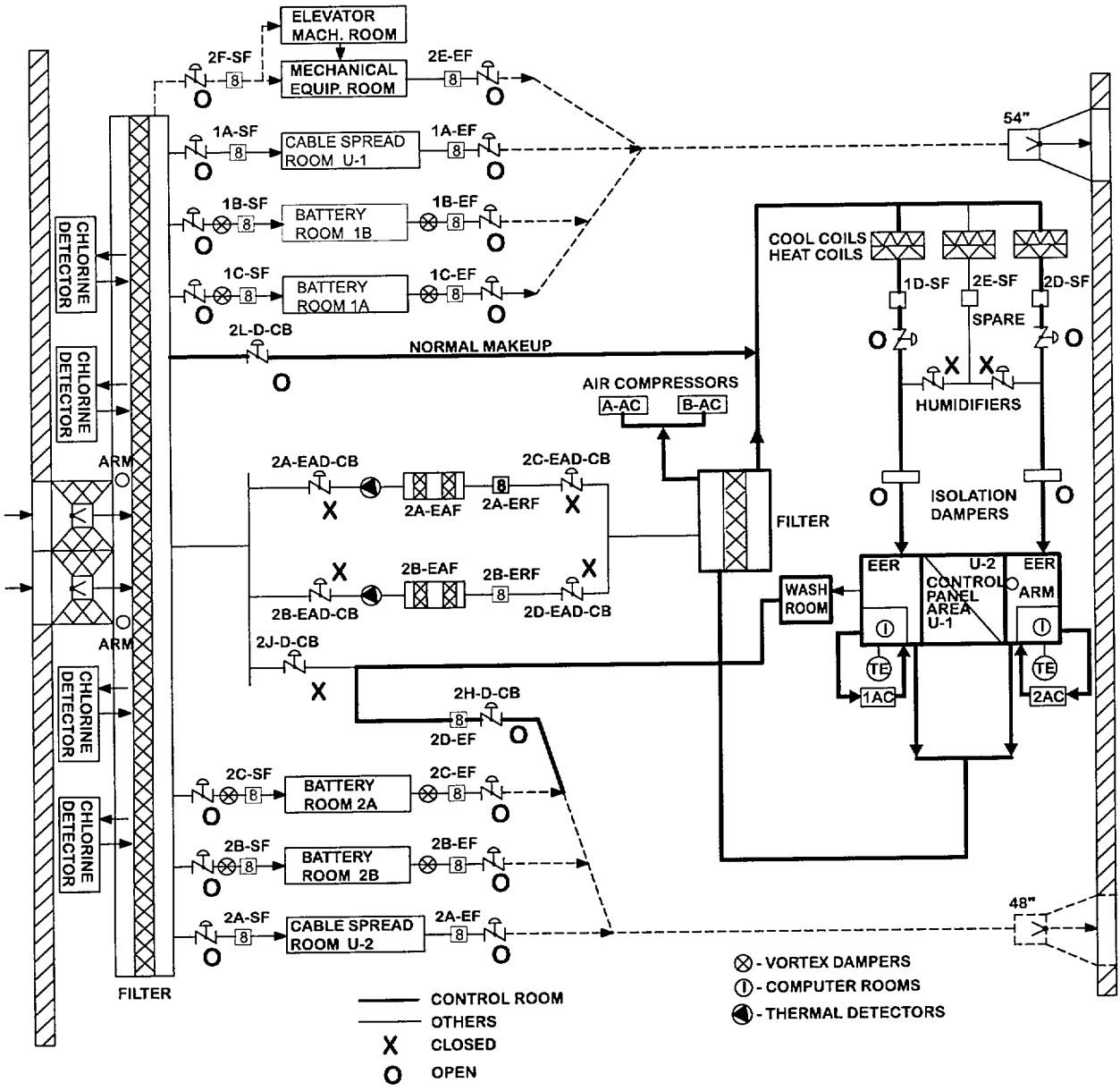
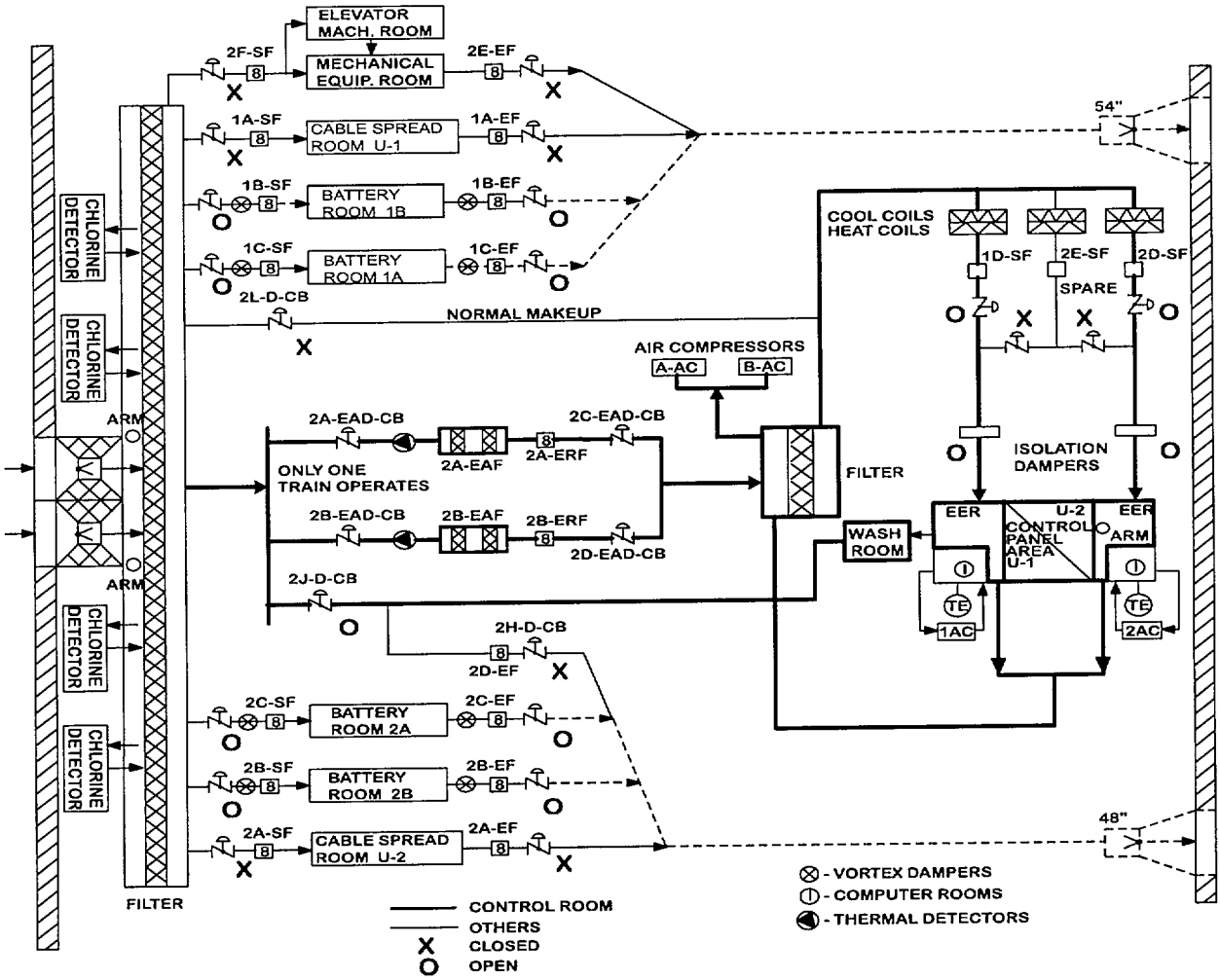


FIGURE 37-2

Control Building Ventilation System : Detected High Rad/Fire



NOTE: U-1/U-2 cable spread fans can be restarted during rad/fire mode with bypass switch.

FIGURE 37-3

Control Building Ventilation System : Detected High Chlorine

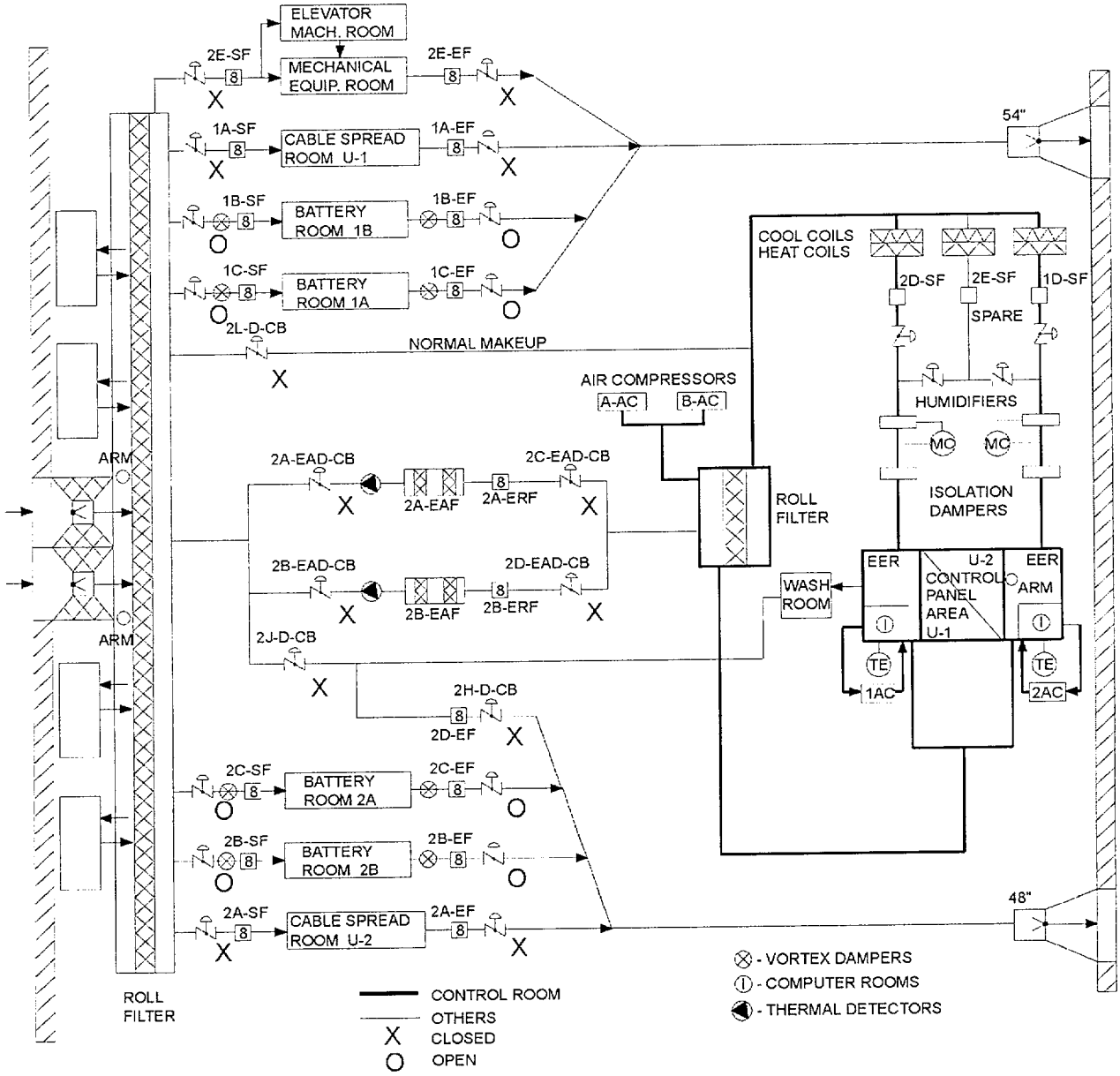


FIGURE 37-4
Chlorine Detector Logic