ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

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PROCEDURE NO. PT-2.3.1Q REV. NO. 6

POST ACCIDENT CHARCOAL FILTER DAMPERS - QUARTERLY

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EFFECTIVE DATE

CATEGORY 1.0

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THIS PROCEDURE CONTAINS 39 PAGES

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PT-2.3.1Q

POST ACCIDENT CHARCOAL FILTER DAMPERS - QUARTERLY

1.0 **PURPOSE:**

1.1 To provide instructions for verifying operability and stroke timing the dampers associated with the Containment Recirculation Fan filter flow paths.

1.2 To provide instructions for performing the monthly inspection of the Containment Recirculation Units.

1.3 Verify Containment Recirculation Fan air flow is greater than 40,400 SCFM to ensure sufficient cooling during the limiting main steam line break accident.

1.4 Measure Containment Recirculation Fan Moisture Separator, HEPA Filter and Charcoal Accident Filter differential pressures on an annual basis.

2.0 **TEST REQUIREMENTS:**

2.1 To exercise each damper through a complete stroking cycle.

2.2 To stroke time each damper in the direction of concern.

2.2.1 Acceptable Stroke Times provided in the procedure may not be exceeded.

2.3 To verify each damper assumes its fail safe position upon loss of control air pressure.

2.3.1 Fail safe operation is verified by normal damper operation.

2.4 To verify loop entry dampers on the Containment Recirc Fans B and D are closed when associated fans are secured.

2.5 To operate each Post Accident Charcoal Filter Unit in the Recirc Mode for at least fifteen minutes.

2.6 To inspect each Containment Recirculation Unit for signs of water within the filtration area.

2.7 To inspect each Containment Recirculation Unit Demister Unit for combustibility.

2.8 To verify operability and proper orientation and flow in the accident mode.

2.9 To verify operability of the Containment Recirc Fan local start stations on an annual basis prior to the RCS exceeding 200°F.

2.10 Measure differential pressure in inches of water across the Containment Recirc Fans moisture separators, HEPA filters and Charcoal Accident filters.

2.11 Evaluate total Containment Recirc Fan Filter Train total differential pressure by summing the individual pressure drops for the filter train components (moisture separators, HEPA filters and charcoal filters for accident trains).

2.12 Measure Containment Recirc Fan Filter Train air flow.

2.13 Completion of the Independent Verification Check.

3.0 REFERENCES:

3.1 33013-1863, Containment HVAC Systems.

3.2 Tech. Specs. Section 4.5.2.3.5.

3.3 S-23.5, Post Accident Charcoal Filter Operation.

3.4 ANSI N510-1989 [Applies only to Demister [Moisture Separators) Unit Combustibility Visual Inspections] Section 5.5.1.6.

3.5 Results and Test Acceptance Criteria Basis (ACB) File.

3.6 Design Analysis, "Development of a CRFC Fan Performance Curve", DA-ME-93-038.

3.7 TREND 95-058.

4.0 **INITIAL CONDITIONS:**

4.1 Damper surveillance may be performed during any plant operating mode. _____

4.2 Notify Shift Supervisor at start of test. _____

4.3 Notify Head Control Operator at start of test. _____

4.4 Any abnormality or erratic damper action observed during performance of procedure shall be noted. A Work Request/Trouble Report shall be submitted for the concerned damper. _____

4.5 A Shortridge Airdata Multimeter is available and has been calibrated within the last 18 months. _____

4.6 Test personnel are qualified in accordance with A-1102. _____

4.7 A Radiation Protection Work Permit has been issued by RP Department to permit Containment entry and/or Recirculation Unit inspection. _____

4.8 If this procedure is being performed as an unscheduled test or following maintenance, initial those sections being completed and mark the remainder N/A. _____

4.9 If the annual local start test is required, ensure Tavg is less than 200°F and a Licensed Operator is available to perform local start. (Mark N/A if annual test not required) _____

5.0 **PRECAUTIONS:**

5.1 Only one group of Containment Recirc dampers shall be tested at a time.

5.2 Observe all requirements of the Radiation Protection Work Permit for Containment entry.

5.3 The Shift Supervisor shall be notified immediately if any acceptance criteria is not met or any malfunction or abnormal conditions occur.

5.4 The Local-Remote switch shall not be placed in LOCAL unless Tavg is less than 200°F.

6.0 INSTRUCTIONS:

6.1 Containment Recirculation Fan A Dampers

NOTE: Steps 6.1.1 through 6.1.4 can be performed in any order.

6.1.1 Verify or place the Containment Recirc Fan A in service. _____

6.1.2 Verify or place the Containment Recirc Fan D in service. _____

6.1.3 Ensure secured or secure the Containment Recirc Fan B. _____

6.1.4 Ensure secured or secure the Containment Recirc Fan C. _____

6.1.5 Visually verify the following damper positions:

6.1.5.1 1F-LED (5873), Loop Entry Damper OPEN _____

6.1.5.2 1I-CID (5871), Charcoal Unit Inlet CLOSED _____

6.1.5.3 1K-COD (5872), Charcoal Unit Outlet CLOSED _____

6.1.6 At the MCB, verify the Green indicating light for charcoal dampers is ON. _____

6.1.7 Verify the 1B Recirc Fan LED (5880) is closed. _____

NOTE: When CF1A/L relay is actuated all three dampers operate, therefore, depending on number of personnel involved, it may be necessary to repeat relay actuation several times to obtain damper stroke times.

6.1.8 Ensure test personnel are in place and ready to perform damper stroke timing.

_____

NOTE: Stroke timing is from audible activation of solenoid valve, to damper position pointer alignment with travel stop arrow.

NOTE: CF1A/L is a latch in relay, located in Relay Room, Rack RA2 Front

6.1.9 Press in CF1A/L relay armature button, and perform damper timing.

_____

6.1.10 Record the following stroke times:

6.1.10.1 1F-LED (5873), Stroke Time CLOSED _____ SECONDS

ACB #	Basis for Limit/ Value	**Acceptance Criteria:** **≤ 26.6 Sec**
94-93	A	

6.1.10.2 1I-CID (5871), Stroke Time OPEN _____ SECONDS

ACB #	Basis for Limit/ Value	**Acceptance Criteria:** **≤ 28.6 Sec**
94-94	A	

6.1.10.3 1K-COD (5872), Stroke Time OPEN _____ SECONDS

ACB #	Basis for Limit/ Value	**Acceptance Criteria:** **≤ 30.1 Sec**
94-95	A	

NOTE: If necessary press 1A CRF RESET button and re-perform steps 6.1.9 through 6.1.11 until all stroke times are obtained.

6.1.11 At the MCB, verify the Green indicating light for charcoal dampers is OFF.

_____

6.1.12 Record time dampers switched to Recirc Mode. _____ hr.

6.2 Containment Recirculation Fan Accident Train A Air Flow Data (Filter Trains A and D)

6.2.1 Filter Train A:

NOTE: Air flow measurements require test personnel to enter the filter unit between the HEPA filters and the moisture separator roughing filters. When measurements are being taken, the doors into the unit must be **CLOSED** to prevent erroneous readings.

6.2.1.1 Using a Shortridge Airdata Multimeter in standard mode and with the Vel-Grid attachment, obtain Filter Train A air flow out of the moisture separator roughing filters. Use Figure 3 for the location of the air flow data points. _____

6.2.1.2 Record data on Attachment A, Filter Train A Air Flow Data Sheet. _____

6.2.1.3 Calculate Filter Train A Air Flow as per Attachment A. _____

6.2.1.4 Ensure Filter Train A air flow is greater than 40,400 SCFM. In the event that the air flow is 40,400 SCFM or less, the "A" Filter train shall be declared inoperable and not returned to service until the condition has been corrected. _____

ACB#	Basis for Limit/Value	Acceptance Criteria
95-168	E	> 40,400 SCFM

6.2.1.5 Record HEPA Filter Magnehelic DP on Attachment A. _____

6.2.2 Filter Train D:

NOTE: Air flow measurements require test personnel to enter the filter unit between the HEPA filters and the moisture separator roughing filters. When measurements are being taken, the doors into the unit must be **CLOSED** to prevent erroneous readings.

6.2.2.1 Using a Shortridge Airdata Multimeter in standard mode and with the Vel-Grid attachment, obtain Filter Train D air flow out of the moisture separator roughing filters. Use Figure 3 for the location of the air flow data points. _____

6.2.2.2 Record data on Attachment D, Filter Train D Air Flow Data Sheet. _____

6.2.2.3 Calculate Filter Train D Air Flow as per Attachment D. _____

6.2.2.4 Ensure Filter Train D air flow is greater than 40,400 SCFM. In the event that the air flow is 40,400 SCFM or less, the "D" Filter train shall be declared inoperable and not returned to service until the condition has been corrected. _____

ACB#	Basis for Limit/Value	Acceptance Criteria
95-171	E	> 40,400 SCFM

6.2.2.4 Record HEPA Filter Magnehelic DP on Attachment D. _____

6.3 Containment Recirc Fan Accident Train A Air Pressure Data (Filter Trains A and D)

NOTE: This section may be marked N/A if the annual test is not required.

NOTE: Refer to Figures 1 and 2 for locations of test points.

NOTE: Total air pressure readings are taken with low pressure connection on the Air Multimeter disconnected and the high pressure connected to the dynamic port on the velprobe.

6.3.1 Filter Train A:

6.3.1.1 Obtain air pressure data at the Containment Recirc Fan A using the Shortridge Air Multimeter with the velprobe as follows:

6.3.1.2 Remove the instrument port cap at Location 1 on the Containment Recirc Fan A Unit. _____

6.3.1.3 Take total air pressure readings in inches of water ("H2O) at Location 1 at depths of 4", 8" and 12" and calculate the average pressure as follows:

$$\frac{\text{reading @ 4"} + \text{reading @ 8"} + \text{reading @ 12"}}{3} = \text{Ave. Rdg Loc1}$$

$$\frac{(\quad [4"]) + (\quad [8"]) + (\quad [12"])}{3} = \frac{\quad}{\text{Ave. Rdg Loc1}}$$

_____

6.3.1.4 Replace the instrument port cap at Location 1. _____

6.3.1.5 Remove the instrument port cap at Location 2 on the Containment Recirc Fan A Unit.

_____

6.3.1.6 Take total air pressure readings in inches of water ("H2O) at Location 2 at depths of 4", 8" and 12" and calculate the average pressure as follows:

$$\frac{\text{reading @ 4" + reading @ 8" + reading @ 12"}}{3} = \text{Ave. Rdg Loc2}$$

$$\frac{(\quad\text{[4"]}) + (\quad\text{[8"]}) + (\quad\text{[12"]})}{3} = \frac{\qquad}{\text{Ave. Rdg Loc2}}$$

_____

6.3.1.7 Replace the instrument port cap at Location 2. _____

6.3.1.8 Calculate Containment Recirc Fan A Unit Moisture Separator differential pressure as follows:

Ave. Rdg Loc1 - Ave. Rdg Loc2 = Mst Sep DP

$$\frac{(\qquad) - (\qquad)}{\text{Ave Rdg Loc1}\quad\text{Ave Rdg Loc2}} = \frac{\qquad}{\text{Mst Sep DP ("H2O)}}$$

_____

6.3.1.9 Transfer Containment Recirc Fan A Unit Moisture Separator differential pressure to Containment Recirc Fan A Inservice Test Sheet.

_____

6.3.1.10 Remove the instrument port cap at Location 3 on the Containment Recirc Fan A Unit.

_____

6.3.1.11 Take total air pressure readings in inches of water ("H2O) at Location 3 at depths of 4", 8" and 12" and calculate the average pressure as follows:

$$\frac{\text{reading @ 4" + reading @ 8" + reading @ 12"}}{3} = \text{Ave. Rdg Loc3}$$

$$\frac{(\quad\text{[4"]}) + (\quad\text{[8"]}) + (\quad\text{[12"]})}{3} = \frac{\qquad}{\text{Ave. Rdg Loc3}}$$

_____

6.3.1.12 Calculate Containment Recirc Fan A Unit HEPA Filter differential pressure as follows:

Ave. Rdg Loc2 - Ave. Rdg Loc3 = HEPA Filter DP

( ) - ( ) = _____
Ave Rdg Loc2 Ave Rdg Loc3 HEPA Filter DP ("H2O)

_____

6.3.1.13 Transfer Containment Recirc Fan A Unit HEPA Filter differential pressure to Containment Recirc Fan A Inservice Test Sheet.

_____

6.3.1.14 Take total air pressure readings in inches of water at Location A07 at depths of 4", 8" and 12" and calculate the average pressure as follows:

$$\frac{\text{reading @ 4" + reading @ 8" + reading @ 12"}}{3} = \text{Ave. Rdg A07}$$

$$\frac{(\quad [4"]) + (\quad [8"]) + (\quad [12"])}{3} = \underline{\qquad}$$
Ave. Rdg A07

_____

6.3.1.15 Take total air pressure readings in inches of water at Location A10 at depths of 4", 8" and 12" and calculate the average pressure reading as follows:

$$\frac{\text{reading @ 4" + reading @ 8" + reading @ 12"}}{3} = \text{Ave. Rdg A10}$$

$$\frac{(\quad [4"]) + (\quad [8"]) + (\quad [12"])}{3} = \underline{\qquad}$$
Ave. Rdg A10

_____

6.3.1.16 Calculate the "A" Train Charcoal Filter differential pressure as follows:

Ave. Rdg A07 - Ave. Rdg A10 = Char Filter DP

( ) - ( ) = _____
Ave Rdg A07 Ave Rdg A10 Char Filter DP ("H2O)

_____

6.3.1.17 Transfer "A" Train Charcoal Filter differential pressure to Containment Recirc Fan A Inservice Test Sheet.

_____

6.3.1.18 Calculate the total A Filter Train differential pressure as follows:

Mst Sep DP + HEPA Fltr DP + Char Fltr DP ("A" Trn) = A Fltr Trn DP ("H2O)

(_____) + (_____) + (_____) = _____
MST SEP DP HEPA FLTR DP CHAR FLTR DP A FLTR TRN DP

_____

6.3.1.19 Transfer A Filter Train differential pressure to Containment Recirc Fan A Inservice Test Sheet.

_____

6.3.2 Filter Train D:

6.3.2.1 Obtain air pressure data at the Containment Recirc Fan D using the Shortridge Air Multimeter with the velprobe as follows:

6.3.2.2 Remove the instrument port cap at Location 1 on the Containment Recirc Fan D Unit.

_____

6.3.2.3 Take total air pressure readings in inches of water ("H2O) at Location 1 at depths of 4", 8" and 12" and calculate the average pressure reading as follows:

$$\frac{\text{reading @ 4"} + \text{reading @ 8"} + \text{reading @ 12"}}{3} = \text{Ave. Rdg Loc1}$$

$$\frac{(\quad [4"]) + (\quad [8"]) + (\quad [12"])}{3} = \frac{\quad}{\text{Ave. Rdg Loc1}}$$

_____

6.3.2.4 Replace the instrument port cap at Location 1. _____

6.3.2.5 Remove the instrument port cap at Location 2 on the Containment Recirc Fan D Unit.

_____

6.3.2.6 Take total air pressure readings in inches of water ("H2O) at Location 2 at depths of 4", 8" and 12" and calculate the average pressure as follows:

$$\frac{\text{reading @ 4" + reading @ 8" + reading @ 12"}}{3} = \text{Ave. Rdg Loc2}$$

$$\frac{(\quad\text{[4"]}) + (\quad\text{[8"]}) + (\quad\text{[12"]})}{3} = \frac{\qquad}{\text{Ave. Rdg Loc2}}$$

_____

6.3.2.7 Replace the instrument port cap at Location 2. _____

6.3.2.8 Calculate Containment Recirc Fan D Unit Moisture Separator differential pressure as follows:

Ave. Rdg Loc1 - Ave. Rdg Loc2 = Mst Sep DP

$$\frac{(\qquad) - (\qquad)}{\text{Ave Rdg Loc1}\quad\text{Ave Rdg Loc2}} = \frac{\qquad}{\text{Mst Sep DP ("H2O)}}$$

_____

6.3.2.9 Transfer Containment Recirc Fan D Unit Moisture Separator differential pressure to Containment Recirc Fan D Inservice Test Sheet.

_____

6.3.2.10 Remove the instrument port cap at Location 3 on the Containment Recirc Fan D Unit.

_____

6.3.2.11 Take total air pressure readings in inches of water ("H2O) at Location 3 at depths of 4", 8" and 12" and calculate the average pressure as follows:

$$\frac{\text{reading @ 4" + reading @ 8" + reading @ 12"}}{3} = \text{Ave. Rdg Loc3}$$

$$\frac{(\quad\text{[4"]}) + (\quad\text{[8"]}) + (\quad\text{[12"]})}{3} = \frac{\qquad}{\text{Ave. Rdg Loc3}}$$

_____

6.3.2.12 Calculate Containment Recirc Fan D Unit HEPA Filter differential pressure as follows:

Ave. Rdg Loc2 - Ave. Rdg Loc3 = HEPA Filter DP

( ) - ( ) = _____
Ave Rdg Loc2 Ave Rdg Loc3 HEPA Filter DP ("H2O)

_____

6.3.2.13 Transfer Containment Recirc Fan D Unit HEPA Filter differential pressure to Containment Recirc Fan D Inservice Test Sheet.

_____

6.3.2.14 Calculate the total D Filter Train differential pressure as follows:

Mst Sep DP + HEPA Fltr DP = D Fltr Trn DP ("H2O)

( ) + ( ) = _____
Mst Sep DP HEPA Fltr DP D Fltr Trn DP

_____

6.3.2.15 Transfer D Filter Train differential pressure to Containment Recirc Fan D Inservice Test Sheet.

_____

6.4 Containment Recric Unit (B & C) Monthly Inspection:

6.4.1 Inspect each of the following as per Attachment 1, Containment Recirc Unit Monthly Inspection Check List.

6.4.2 Recirc Unit B _____

6.4.3 Recirc Unit C _____

6.5 1A Recirculation Fan Dampers Restoration

NOTE: Fan must operate in Recirc Mode for at least fifteen minutes to satisfy Tech Spec requirements.

6.5.1 After at least fifteen minutes of Recirc Mode operation, press 1A CRF relay RESET button. _____

6.5.2 Record time dampers switched to Normal Mode. _____ hr.

6.5.3 Visually verify the following damper positions:

6.5.3.1 1F-LED (5873), Loop Entry Damper OPEN _____

6.5.3.2 1I-CID (5871), Charcoal Unit Inlet CLOSED _____

6.5.3.3 1K-COD (5872), Charcoal Unit Outlet CLOSED _____

6.5.4 At the MCB, verify the Green indicating light for charcoal dampers is ON. _____

6.5.5 Record Post Accident Filter run time in S-23.5 located on back of MCB. _____

6.5.6 Independent Verification

NOTE: If annual DP measurements were not performed, mark this step N/A.

6.5.6.1 Containment Recirc Fan A Unit Instrument Port Cap at Location 1.
Cap Installed _____

6.5.6.2 Containment Recirc Fan A Unit Instrument Port Cap at Location 2.
Cap Installed _____

6.5.6.3 Containment Recirc Fan A Unit Instrument Port Cap at Location 3.
Cap Installed _____

6.5.6.4 Containment Recirc Fan D Unit Instrument Port Cap at Location 1.
Cap Installed _____

6.5.6.5 Containment Recirc Fan D Unit Instrument Port Cap at Location 2.
Cap Installed _____

6.5.6.6 Containment Recirc Fan D Unit Instrument Port Cap at Location 3.
Cap Installed _____

6.6 Containment Recirculation Fan C Dampers

NOTE: Steps 6.6.1 through 6.6.4 can be performed in any order.

6.6.1 Verify or place the Containment Recirc Fan C in service. _____

6.6.2 Verify or place the Containment Recirc Fan B in service. _____

6.6.3 Ensure secured or secure the Containment Recirc Fan A. _____

6.6.4 Ensure secured or secure the Containment Recirc Fan D. _____

6.6.5 Visually verify the following damper positions:

6.6.5.1 1H-LED (5875), Loop Entry Damper OPEN _____

6.6.5.2 1J-CID (5876), Charcoal Unit Inlet CLOSED _____

6.6.5.3 1L-COD (5874), Charcoal Unit Outlet CLOSED _____

6.6.6 At the MCB, verify the Green indicating light for charcoal dampers is ON. _____

6.6.7 Verify the 1D Recirc Fan LED (5877) is closed. _____

NOTE: When CF1C/L relay is actuated all three dampers operate, therefore, depending on number of personnel involved, it may be necessary to repeat relay actuation several times to obtain damper stroke times.

6.6.8 Ensure test personnel are in place and ready to perform damper stroke timing. _____

NOTE: Stroke timing is from audible activation of solenoid valve, to damper position pointer alignment with travel stop arrow.

NOTE: CF1C/L is a latch in relay, located in Relay Room, Rack RA3 Front

6.6.9 Press in CF1C/L relay armature button, and perform damper timing. _____

6.6.10 Record the following stroke times:

6.6.10.1 1H-LED (5875), Stroke Time CLOSED _____ SECONDS

ACB #	Basis for Limit/ Value	**Acceptance Criteria:** **≤ 26.7 Sec**
94-96	A	

6.6.10.2 1J-CID (5876), Stroke Time OPEN _____ SECONDS

ACB #	Basis for Limit/ Value	**Acceptance Criteria:** **≤ 29.5 Sec**
94-97	A	

6.6.10.3 1L-COD (5874), Stroke Time OPEN _____ SECONDS

ACB #	Basis for Limit/ Value	**Acceptance Criteria:** **≤ 36.0 Sec**
94-98	A	

NOTE: If necessary press 1C CRF RESET button and re-perform steps 6.6.9 through 6.6.11 until all stroke times are obtained.

6.6.11 At the MCB, verify the Green indicating light for charcoal dampers is OFF. _____

6.6.12 Record time dampers switched to Recirc Mode. _____ Hr.

6.7 Containment Recirculation Fan Accident Train B Air Flow Data (Filter Trains C and B)

6.7.1 Filter Train C:

NOTE: Air flow measurements require test personnel to enter the filter unit between the HEPA filters and the moisture separator roughing filters. When measurements are being taken, the doors into the unit must be **CLOSED** to prevent erroneous readings.

6.7.1.1 Using a Shortridge Airdata Multimeter in standard mode and with the Vel-Grid attachment, obtain Filter Train C air flow out of the moisture separator roughing filters. Use Figure 3 for the location of the air flow data points.

_____

6.7.1.2 Record data on Attachment C, Filter Train C Air Flow Data Sheet.

_____

6.7.1.3 Calculate Filter Train C Air Flow as per Attachment C. _____

6.7.1.4 Ensure Filter Train C air flow is greater than 40,400 SCFM. In the event that the air flow is 40,400 SCFM or less, the "C" Filter train shall be declared inoperable and not returned to service until the condition has been corrected.

_____

ACB#	Basis for Limit/Value	Acceptance Criteria
95-170	E	> 40,400 SCFM

6.7.1.5 Record HEPA Filter Magnehelic DP on Attachment C. _____

6.7.2 Filter Train B:

NOTE: Air flow measurements require test personnel to enter the filter unit between the HEPA filters and the moisture separator roughing filters. When measurements are being taken, the doors into the unit must be **CLOSED** to prevent erroneous readings.

6.7.2.1 Using a Shortridge Airdata Multimeter in standard mode and with the Vel-Grid attachment, obtain Filter Train B air flow out of the moisture separator roughing filters. Use Figure 3 for the location of the air flow data points.

_____

6.7.2.2 Record data on Attachment B, Filter Train B Air Flow Data Sheet.

_____

6.7.2.3 Calculate Filter Train B Air Flow as per Attachment B. _____

6.7.2.4 Ensure Filter Train B air flow is greater than 40,400 SCFM. In the event that the air flow is 40,400 SCFM or less, the "B" Filter train shall be declared inoperable and not returned to service until the condition has been corrected.

_____

ACB#	Basis for Limit/Value	Acceptance Criteria
95-169	E	> 40,400 SCFM

6.7.2.5 Record HEPA Filter Magnehelic DP on Attachment B. _____

6.8 Containment Recirc Fan Accident Train B Air Pressure Data (Filter Trains B and C)

NOTE: This section may be marked N/A if the annual test is not required.

NOTE: Refer to Figures 1 and 2 for locations of test points.

NOTE: Total air pressure readings are taken with low pressure connection on the Air Multimeter disconnected and the high pressure connected to the dynamic port on the velprobe.

6.8.1 Filter Train B:

6.8.1.1 Obtain air pressure data at the Containment Recirc Fan B using the Shortridge Air Multimeter with the velprobe as follows:

6.8.1.2 Remove the instrument port cap at Location 1 on the Containment Recirc Fan B Unit.

_____

6.8.1.3 Take total air pressure readings in inches of water ("H2O) at Location 1 at depths of 4", 8" and 12" and calculate average pressure as follows:

$$\frac{\text{reading @ 4" + reading @ 8" + reading @ 12"}}{3} = \text{Ave. Rdg Loc1}$$

$$\frac{(\quad\quad [4"]) + (\quad\quad [8"]) + (\quad\quad [12"])}{3} = \underline{\qquad\qquad}$$

Ave. Rdg Loc1

_____

6.8.1.4 Replace the instrument port cap at Location 1. _____

6.8.1.5 Remove the instrument port cap at Location 2 on the Containment Recirc Fan B Unit.

_____

6.8.1.6 Take total air pressure readings in inches of water ("H2O) at Location 2 at depths of 4", 8" and 12" and record readings.calculate the average pressure as follows:

$$\frac{\text{reading @ 4"} + \text{reading @ 8"} + \text{reading @ 12"}}{3} = \text{Ave. Rdg Loc2}$$

$$\frac{(\quad [4"]) + (\quad [8"]) + (\quad [12"])}{3} = \frac{\quad}{\text{Ave. Rdg Loc2}}$$

_____

6.8.1.7 Replace the instrument port cap at Location 2. _____

6.8.1.8 Calculate Containment Recirc Fan B Unit Moisture Separator differential pressure as follows:

Ave. Rdg Loc1 - Ave. Rdg Loc2 = Mst Sep DP

$$\frac{(\quad)}{\text{Ave Rdg Loc1}} - \frac{(\quad)}{\text{Ave Rdg Loc2}} = \frac{\quad}{\text{Mst Sep DP ("H2O)}}$$

_____

6.8.1.9 Transfer Containment Recirc Fan B Unit Moisture Separator differential pressure to Containment Recirc Fan B Inservice Test Sheet.

_____

6.8.1.10 Remove the instrument port cap at Location 3 on the Containment Recirc Fan B Unit.

_____

6.8.1.11 Take total air pressure readings in inches of water ("H2O) at Location 3 at depths of 4", 8" and 12" and calculate average pressure as follows:

$$\frac{\text{reading @ 4"} + \text{reading @ 8"} + \text{reading @ 12"}}{3} = \text{Ave. Rdg Loc3}$$

$$\frac{(\quad [4"]) + (\quad [8"]) + (\quad [12"])}{3} = \frac{\quad}{\text{Ave. Rdg Loc3}}$$

_____

6.8.1.12 Calculate Containment Recirc Fan B Unit HEPA Filter differential pressure as follows:

Ave. Rdg Loc2 - Ave. Rdg Loc3 = HEPA Filter DP

( ) - ( ) = _____
Ave Rdg Loc 2 Ave Rdg Loc 3 HEPA Filter DP ("H2O)

_____

6.8.1.13 Transfer Containment Recirc Fan B Unit HEPA Filter differential pressure to Containment Recirc Fan B Inservice Test Sheet.

_____

6.8.1.14 Calculate the total B Filter Train differential pressure as follows:

Mst Sep DP + HEPA Fltr DP = B Lltr Trn DP ("H2O)

( ) + ( ) = _____
Mst Sep DP HEPA Fltr DP B Fltr Trn DP

_____

6.8.1.15 Transfer B Filter Train differential pressure to Containment Recirc Fan B Inservice Test Sheet.

_____

6.8.2 Filter Train C:

6.8.2.1 Obtain air pressure data at the Containment Recirc Fan C using the Shortridge Air Multimeter with the velprobe as follows:

6.8.2.2 Remove the instrument port cap at Location 1 on the Containment Recirc Fan C Unit.

_____

6.8.2.3 Take total air pressure readings in inches of water ("H2O) at Location 1 at depths of 4", 8" and 12" and calculate average pressure as follows:

$$\frac{\text{reading @ 4" + reading @ 8" + reading @ 12"}}{3} = \text{Ave. Rdg Loc1}$$

$$\frac{(\quad [4"]) + (\quad [8"]) + (\quad [12"])}{3} = \frac{\quad}{\text{Ave. Rdg Loc1}}$$

_____

6.8.2.4 Replace the instrument port cap at Location 1. _____

6.8.2.5 Remove the instrument port cap at Location 2 on the Containment Recirc Fan C Unit.

_____

6.8.2.6 Take total air pressure readings in inches of water ("H2O) at Location 2 at depths of 4", 8" and 12" and calculate average pressure as follows:

$$\frac{\text{reading @ 4" + reading @ 8" + reading @ 12"}}{3} = \text{Ave. Rdg Loc2}$$

$$\frac{(\quad [4"]) + (\quad [8"]) + (\quad [12"])}{3} = \frac{\quad}{\text{Ave. Rdg Loc2}}$$

_____

6.8.2.7 Replace the instrument port cap at Location 2. _____

6.8.2.8 Calculate Containment Recirc Fan C Unit Moisture Separator differential pressure as follows:

Ave. Rdg Loc1 - Ave. Rdg Loc2 = Mst Sep DP

$$\frac{(\quad) - (\quad)}{\text{Ave Rdg Loc1} \qquad \text{Ave Rdg Loc2}} = \frac{\quad}{\text{Mst Sep DP ("H2O)}}$$

_____

6.8.2.9 Transfer Containment Recirc Fan C Unit Moisture Separator differential pressure to Containment Recirc Fan C Inservice Test Sheet.

_____

6.8.2.10 Remove the instrument port cap at Location 3 on the Containment Recirc Fan C Unit.

_____

6.8.2.11 Take total air pressure readings in inches of water ("H2O) at Location 3 at depths of 4", 8" and 12" and calculate the average pressure as follows:

$$\frac{\text{reading @ 4" + reading @ 8" + reading @ 12"}}{3} = \text{Ave. Rdg Loc3}$$

$$\frac{(\quad\text{[4"]}) + (\quad\text{[8"]}) + (\quad\text{[12"]})}{3} = \frac{\quad}{\text{Ave. Rdg Loc3}}$$

_____

6.8.2.12 Calculate Containment Recirc Fan C Unit HEPA Filter differential pressure as follows:

Ave. Rdg Loc2 - Ave. Rdg Loc3 = HEPA Filter DP

$$\frac{(\quad) - (\quad)}{\text{Ave Rdg Loc2} \quad \text{Ave Rdg Loc3}} = \frac{\quad}{\text{HEPA Filter DP ("H2O)}}$$

_____

6.8.2.13 Transfer Containment Recirc Fan C Unit HEPA Filter differential pressure to Containment Recirc Fan C Inservice Test Sheet.

_____

6.8.2.14 Take total air pressure readings in inches of water at Location C05 at depths of 4", 8" and 12" and calculate the average pressure as follows:

$$\frac{\text{reading @ 4" + reading @ 8" + reading @ 12"}}{3} = \text{Ave. Rdg C05}$$

$$\frac{(\quad\text{[4"]}) + (\quad\text{[8"]}) + (\quad\text{[12"]})}{3} = \frac{\quad}{\text{Ave. Rdg C05}}$$

_____

6.8.2.15 Take total air pressure readings in inches of water at Location C10 at depths of 4", 8" and 12" and calculate the average pressure as follows:

$$\frac{\text{reading @ 4"} + \text{reading @ 8"} + \text{reading @ 12"}}{3} = \text{Ave. Rdg C10}$$

$$\frac{(\quad\text{[4"]}) + (\quad\text{[8"]}) + (\quad\text{[12"]})}{3} = \frac{\qquad}{\text{Ave. Rdg C10}}$$

_____

6.8.2.16 Calculate the "B" Train Charcoal Filter differential pressure as follows:

Ave. Rdg C05 - Ave. Rdg C10 = Char Filter DP

$$\frac{(\qquad)}{\text{Ave Rdg C05}} - \frac{(\qquad)}{\text{Ave Rdg C10}} = \frac{\qquad}{\text{Char Filter DP ("H2O)}}$$

_____

6.8.2.17 Transfer "B" Train Charcoal Filter differential pressure to Containment Recirc Fan C Inservice Test Sheet.

_____

6.8.2.18 Calculate the total C Filter Train differential pressure as follows:

Mst Sep DP + HEPA Fltr DP + Char Fltr DP ("B" Trn) = C Fltr Trn DP ("H2O)

$$\frac{(\qquad)}{\text{Mst Sep DP}} + \frac{(\qquad)}{\text{HEPA Fltr DP}} + \frac{(\qquad)}{\text{Char Fltr DP}} = \frac{\qquad}{\text{C Fltr Trn DP}}$$

_____

6.8.2.19 Transfer C Filter Train differential pressure to Containment Recirc Fan C Inservice Test Sheet.

_____

6.9 <u>Containment Recirc Unit (A & D) Monthly Inspection</u>:

6.9.1 Inspect each of the following as per Attachment 1, Containment Recirc Unit Monthly Inspection Check List.

6.9.2 Recirc Unit A _____

6.9.3 Recirc Unit D _____

6.10 1C Recirculation Fan Dampers Restoration

NOTE: Fan must operate in Recirc Mode for at least fifteen minutes to satisfy Tech Spec requirements.

6.10.1 After at least fifteen minutes of Recirc Mode operation, press 1C CRF relay RESET button. _____

6.10.2 Record time dampers switched to Normal Mode. _____ hr.

6.10.3 Visually verify the following damper positions:

6.10.3.1 1H-LED (5875), Loop Entry Damper OPEN _____

6.10.3.2 1J-CID (5876), Charcoal Unit Inlet CLOSED _____

6.10.3.3 1L-COD (5874), Charcoal Unit Outlet CLOSED _____

6.10.4 At the MCB, verify the Green indicating light for charcoal dampers is ON. _____

6.10.5 Record Post Accident Filter run time in S-23.5 located on back of MCB. _____

6.10.6 Independent Verification

NOTE: If annual DP measurements were not performed, mark this step N/A.

6.10.6.1 Containment Recirc Fan B Unit Instrument Port Cap at Location 1.
Cap Installed _____

6.10.6.2 Containment Recirc Fan B Unit Instrument Port Cap at Location 2.
Cap Installed _____

6.10.6.3 Containment Recirc Fan B Unit Instrument Port Cap at Location 3.
Cap Installed _____

6.10.6.4 Containment Recirc Fan C Unit Instrument Port Cap at Location 1.
Cap Installed _____

6.10.6.5 Containment Recirc Fan C Unit Instrument Port Cap at Location 2.
Cap Installed _____

6.10.6.6 Containment Recirc Fan C Unit Instrument Port Cap at Location 3.
Cap Installed _____

6.11 Annual Local Start Test of Containment Recirc Fans

CAUTION: This section shall only be performed with Tavg less than 200°F.

NOTE: This section may be marked N/A if the annual test is not required.

6.11.1 Perform local start test for each containment recirc fan as follows:

NOTE: The following steps refer to the specific containment recirc unit being tested. Units not being tested shall be controlled by Operations as required by plant conditions.

		Recirc Unit			
		A	B	C	D
6.11.1.1	Ensure the CNMT Recirc Fan is not in operation.	____	____	____	____

NOTE: When the Local-Remote switch is placed in LOCAL, Control Room indication (Red/Green lights) for the CNMT Recirc Fan is lost.

6.11.1.2	Place the CNMT Recirc Fan Local/Remote switch in LOCAL.	____	____	____	____
6.11.1.3	Verify Annunciator K-14, EMERGENCY SHUTDOWN LOCAL CONTROL is ON.	____	____	____	____

CAUTION: All local fan operations shall be performed by a Licensed Operator.

6.11.1.4	Start the CNMT Recirc Fan.	____	____	____	____
6.11.1.5	Stop the CNMT Recirc Fan.	____	____	____	____
6.11.1.6	Place the CNMT Recirc Fan Local/Remote switch in REMOTE.	____	____	____	____
6.11.1.7	Verify Annunciator K-14 is OFF.	____	____	____	____

NOTE: Independent Verification of system restoration shall be performed by an individual knowledgeable in the system and not involved in the initial restoration, normally an Auxiliary or Licensed Operator (active or inactive).

6.11.2. INDEPENDENT VERIFICATION

6.11.2.1	A-CNMT Recirc Fan Local/Remote Switch	REMOTE_____
6.11.2.2	B-CNMT Recirc Fan Local/Remote Switch	REMOTE_____
6.11.2.3	C-CNMT Recirc Fan Local/Remote Switch	REMOTE_____
6.11.2.4	D-CNMT Recirc Fan Local/Remote Switch	REMOTE_____

COMMENTS:

COMPLETED BY: _____

DATE COMPLETED: _____

HEAD CONTROL OPERATOR: _____

SHIFT SUPERVISOR: _____

RESULTS & TEST REVIEW: _____ DATE _____

ATTACHMENT 1

Containment Recirc Unit Monthly Inspection Check List

UNIT

ACB # 94-178	Basis for Limits/Values A,C	A	B	C	D
1.	Ensure Recirc Fan Unit is not in Operation.				
2.	Ensure each drain free of foreign material.				
3.	Inspect fan chiller piping area for possible service water leaks.				
4.	Inspect HEPA filter section for evidence of water about floor area and any water damage to HEPA filter units.				
5.	Inspect Demister Unit for combustibility utilizing the following criteria:				
a)	No visual evidence of dirt or debris loading.				
b)	No visual evidence of oil or foreign materials susceptible to combustion.				

6. Remove fan units from service which are not needed at this time. _____

7. Submit a Work Request/Trouble Report if any discrepancies are noted. _____

Key: Basis for Limits/Values

V - Vendor
E - Engineering
A - Administrative
C - Code
T - Tech Spec

COMPLETED BY: _____

DATE COMPLETED: _____

Containment Recirc Fan A Inservice Test Sheet

"A" Filter Train Parameter Data	
Test Parameter	Measured Value
Moisture Separator DP	
HEPA Filter DP	
Charcoal Filter DP	
"A" Filter Train Total DP	

Is the Charcoal or HEPA filter DP greater than the Technical Specification operability limit of 3" H20? If the DP is greater than 3" H2O, the filter train shall be declared inoperable and not returned to service until the condition has been corrected.

Yes / No (circle one) _____

ACB#	Basis for Limit/Value	(HEPA) Acceptance Criteria
95-172	T	< 3.00"H2O

ACB#	Basis for Limit/Value	(CHARCOAL) Acceptance Criteria
95-176	T	< 3.00"H2O

Performed by: _____ Date: _____

Review by: _____ Date: _____

Containment Recirc Fan B Inservice Test Sheet

"B" Filter Train Parameter Data	
Test Parameter	Measured Value
Moisture Separator DP	
HEPA Filter DP	
"B" Filter Train Total DP	

Is the HEPA filter DP greater than the Technical Specification operability limit of 3" H20? If the DP is greater than 3" H2O, the filter train shall be declared inoperable and not returned to service until the condition has been corrected.

Yes / No (circle one) _____

ACB#	Basis for Limit/Value	(HEPA) Acceptance Criteria
95-173	T	< 3.00"H2O

Performed by: _____ Date: _____

Review by: _____ Date: _____

Containment Recirc Fan C Inservice Test Sheet

"C" Filter Train Parameter Data	
Test Parameter	Measured Value
Moisture Separator DP	
HEPA Filter DP	
Charcoal Filter DP	
"C" Filter Train Total DP	

Is the Charcoal or HEPA filter DP greater than the Technical Specification operability limit of 3" H2O? If the DP is greater than 3" H2O, the filter train shall be declared inoperable and not returned to service until the condition has been corrected.

Yes / No (circle one) _____

ACB#	Basis for Limit/Value	(HEPA) Acceptance Criteria
95-174	T	< 3.00"H2O

ACB#	Basis for Limit/Value	(CHARCOAL) Acceptance Criteria
95-177	T	< 3.00"H2O

Performed by: _____ Date: _____

Review by: _____ Date: _____

Containment Recirc Fan D Inservice Test Sheet

"D" Filter Train Parameter Data	
Test Parameter	Measured Value
Moisture Separator DP	
HEPA Filter DP	
"D" Filter Train Total DP	

Is the HEPA filter DP greater than the Technical Specification operability limit of 3" H2O? If the DP is greater than 3" H2O, the filter train shall be declared inoperable and not returned to service until the condition has been corrected.

Yes / No (circle one) _____

ACB#	Basis for Limit/Value	(HEPA) Acceptance Criteria
95-175	T	< 3.00"H2O

Performed by: _____ Date: _____

Review by: _____ Date: _____

Attachment A

Filter Train A Air Flow (Moisture Separator) Data Sheet	
Location	**Location Velocity (Ft/Min)**
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
Total	
Average (Total ÷ 12)	
Air Flow (Ave.*96.39ft^2)	SCFM

Airdata Multimeter : RT- _____

HEPA Filter Magnehelic DP: _____ "H2O

ACB#	Basis for Limit/Value	(HEPA) Acceptance Criteria
95-172	T	< 3.00"H2O

Completed by: _____ Date: _____

Reviewed by: _____ Date: _____

Attachment B

Filter Train B Air Flow (Moisture Separator) Data Sheet	
Location	**Location Velocity (Ft/Min)**
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
Total	
Average (Total ÷ 12)	
Total Flow (Ave.*96.39ft^2)	SCFM

Airdata Multimeter : RT- _____

HEPA Filter Magnehelic DP: _____ "H2O

ACB#	Basis for Limit/Value	(HEPA) Acceptance Criteria
95-173	T	< 3.00"H2O

Completed by: _____ Date: _____

Reviewed by: _____ Date: _____

Attachment C

Filter Train C Air Flow (Moisture Separator) Data Sheet	
Location	**Location Velocity (Ft/Min)**
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
Total	
Average (Total ÷ 12)	
Total Flow (Ave.*96.39ft^2)	SCFM

Airdata Multimeter : RT- _____

HEPA Filter Magnehelic DP: _____ "H2O

ACB#	Basis for Limit/Value	(HEPA) Acceptance Criteria
95-174	T	< 3.00"H2O

Completed by: _____ Date: _____

Reviewed by: _____ Date: _____

Attachment D

Filter Train D Air Flow (Moisture Separator) Data Sheet	
Location	**Location Velocity (Ft/Min)**
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
Total	
Average (Total ÷ 12)	
Total Flow (Ave.*96.39ft^2)	SCFM

Airdata Multimeter : RT- _____

HEPA Filter Magnehelic DP: _____ "H2O

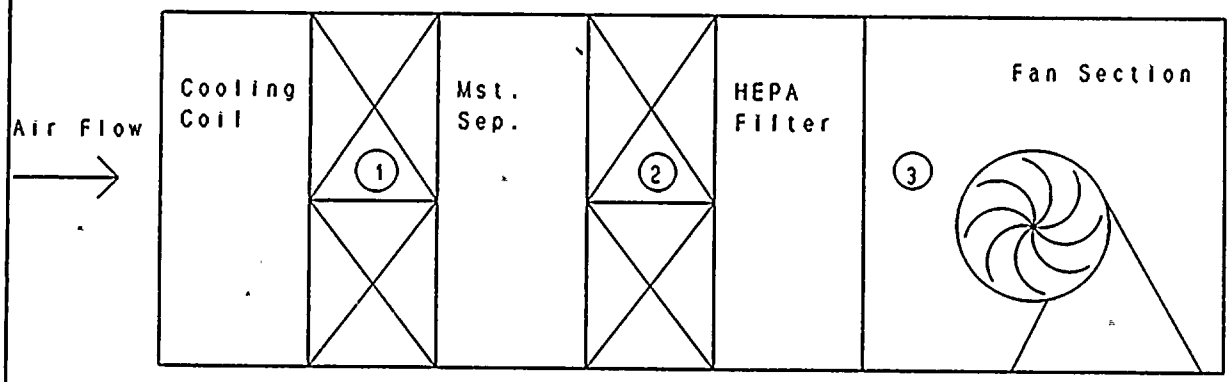
ACB#	Basis for Limit/Value	(HEPA) Acceptance Criteria
95-175	T	< 3.00"H2O

Completed by: _____ Date: _____

Reviewed by: _____ Date: _____

Figure 1

CRFC Pressure Test Points



Pressure test points, (1), (2), and (3) have plugs installed that mus be removed for pressure readings.

Figure 2
Cont. Recirc Fan Pressure Test Points

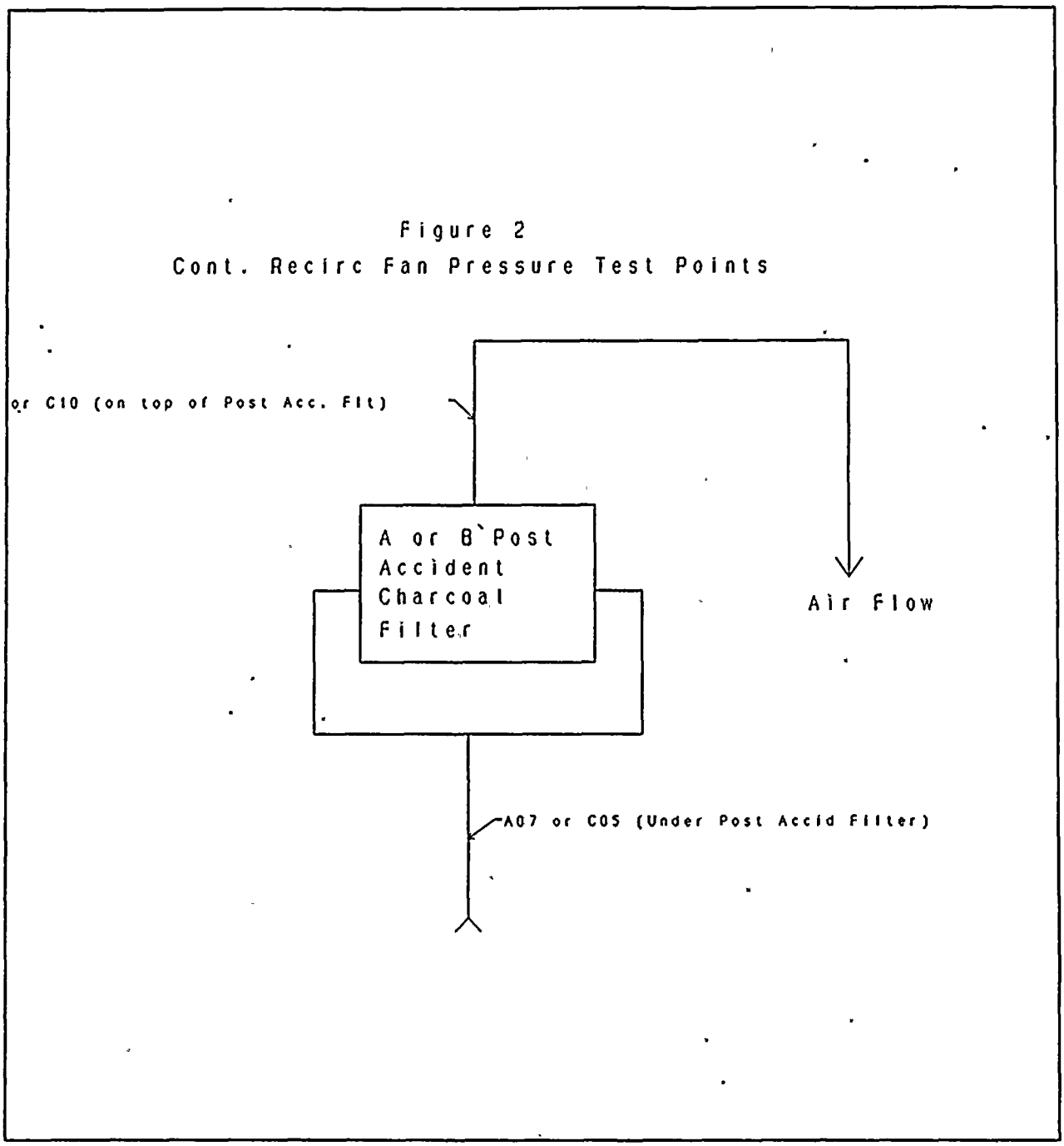


Figure 3

Moisture Separator Air Flow Points

(Looking into Moisture Separator)

	1		2	
3		4		5
	6		7	
8		9		10
	11		12	