

RHIC Operations Procedures Manual

**4.501 PASS Subsystem Test: Compressor Building Oxygen
Deficiency Detection and Fan Activation,
Semi-Annual Acceptance Tests for PEER 19 (Bldg 1005H)**

Text Pages 1 through 4
Attachments 1 through 4

Hand Processed Changes

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Approved:

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Category A

**ONLINE COPY RHIC OPERATIONS PROCEDURES MANUAL
- VALID FOR FIVE (5) WORKING DAYS**

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**4.501 PASS Subsystem Test: Compressor Building Oxygen
Deficiency Detection and Fan Activation,
Semi-Annual Acceptance Tests for PEER 19 (Bldg 1005H)**

1. Purpose and Scope

- 1.1 To test the Compressor Building portion of the RHIC Particle Accelerator Safety System (PASS) for ODH detection and response.
- A. ODH Sensors AS5H-1, AS5H-2, AS5H-3 and AS5H-4; Exhaust Fans HEF1, HEF2, HEF3 and HEF4; Supply Fans HS1, HS2, HS3, HS4 and HS5.
 - B. PASS Operation States: None specified for these tests.

2. Responsibilities

- 2.1 Members of the RHIC Safety Systems Section shall, as designated:
- 2.1.1 conduct this test procedure;
 - 2.1.2 document tests performed, problems found, and repairs made in the PASS Maintenance Log Book;
 - 2.1.3 complete the Test Checklist items within the test procedure;
 - 2.1.4 inform the RHIC Safety Systems Section Head of any failures found.
- 2.2 The RHIC Safety Systems Section Head shall:
- 2.2.1 ensure that this procedure is executed at no greater than six month intervals, or at such times as required by the Accelerator Systems Safety Committee (ASSC);
 - 2.2.2 review and sign the completed test procedure;
 - 2.2.3 report any as-found unsafe failures to the Assistant to the RHIC Project Head for ES&H and the Chairman of the Accelerator Systems Safety Committee.

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- 2.3 The ASSC Chairman (or designee) shall:
 - 2.3.1 review the test results;
 - 2.3.2 determine when retesting is required after changes in hardware or software have been implemented.

3. Prerequisites

3.1 Minimum Personnel

- 3.1.1 Sufficient members (minimum of 2) of the RHIC Safety System Section, who shall be trained as per Section 3.2.
- 3.1.2 Members of the RHIC Cryo Group to activate Cryo equipment during testing, as required.

3.2 Training

- 3.2.1 All Team members: RHIC Access Training.
- 3.2.2 Test Team Leader: BNL Lockout/Tagout.

3.3 Equipment

- 3.3.1 None.

3.4 Other PASS test procedures to be executed before executing this procedure:

- 3.4.1 Current calibration of all ODH detectors in operation in building 1005H.

4. Precautions

None

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5. **Procedure**

NOTE 1 *If at any time either Division A or B equipment does not show the expected results, the test shall be halted and the necessary repairs made. The failure shall be noted on the Test Checklist. Details of the problem and repairs made shall be recorded in the PASS Maintenance Log Book and reported to the RHIC Safety Systems Section Head. The test procedure shall then be restarted from the beginning.*

5.1 Designate one team member to be the "Test Team Leader", other members as required to be "Assistants".

NOTE 2 *The Test Team Leader should check off the items on the Test Procedure form as each step is successfully completed (even if someone else has actually done the step.)*

5.2 Test Team Leader: Notify the RHIC Cryo Group Leader that the building 1005H area is to be tested.

5.3 Conduct Acceptance Tests as delineated in Attachment #4.

6. **Documentation**

6.1 PASS Completion Checkoff List. Original to be permanently filed following completion of testing.

6.2 PASS Trouble Log Tracking Sheet. Original to be permanently filed following completion of testing.

6.3 Procedure Summary Sign-off Sheet. Original to be permanently filed following completion of testing.

6.4 Test Procedure (Attachment #4 to this OPM). Original to be permanently filed following completion of testing.

6.5 PASS Maintenance Log Book

7. **References**

7.1 None

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8. Attachments

1. PASS Completion Checkoff List
2. PASS Trouble Log Tracking Sheet
3. Procedure Summary Sign-off Sheet
4. Test procedure to be executed (PEER 19/2.0)

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Attachment #1

PASS ACCEPTANCE PROCEDURES; COMPLETION CHECKOFF LIST

Section	Description	Errors found?	Errors Corrected	Retesting complete	Procedure Complete	By	Notes
2.1	Test individual sensor responses	Y N	___/___/___	___/___/___	___/___/___		
2.2	Manual fan controls	Y N	___/___/___	___/___/___	___/___/___		
2.3	Sensitivity to Helium check	Y N	___/___/___	___/___/___	___/___/___		

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Attachment #2: Test Procedure Summary Sign-off Sheet:

Test Team Leader: Check one box.

No failures found "

Failures were found (noted below) "

Test Notes:

=====

Software Title and Revision; Division A: _____

Software Title and Revision; Division B: _____

Test Team Leader (sign): _____

Life No. _____ Date: _____

Assistant (sign): _____

Life No. _____ Date: _____

=====

Reviewed by Safety Section Head: _____

Life No. _____ Date: _____

Approved by ASSC: _____

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Life No. _____ Date:

Attachment #3

PASS Acceptance Test; Trouble Log Tracking Sheet:

Sect	Pg	Problem Description	Proc	Hard ware	Soft ware	Rev	Fixed

2.0. COMPRESSOR BLDG Oxygen Deficiency Detection and Fan Activation**Attachment #4**

PASS ANNUAL ACCEPTANCE TEST PROTOCOL

COMPRESSOR BUILDING (1005H)

2.0. COMPRESSOR BLDG Oxygen Deficiency Detection and Fan Activation

2.0 Purpose: To satisfy the requirement for periodic re-testing of PASS Sub-systems; mechanical and electrical functions of the **COMPRESSOR Building ODH** systems for **PEER 19**.

2.0.1. COMPRESSOR BUILDING ODH devices to be tested: **Sensors: AS5H-1, AS5H-2, AS5H-3 and AS5H-4; ODH boxes 5HODB1, 5HODB2, 5HODB3 and 5HODB4; Exhaust Fans HEF1, HEF2, HEF3 and HEF4; Supply Fans HS1, HS2, HS3, HS4 and HS5.**

2.0.2. Initial Conditions:

- 2.0.2.1. Download a fresh version of the operating software into both Division A and Division B PLCs before beginning this test.
- 2.0.2.2. Place key switch on both Div A and Div B field PLCs in "RUN" position and remove keys.
- 2.0.2.3. Ensure that any connected Panel View devices are incapable of writing to the PLCs under test.

2.1. Check individual Div A & B PLC response to sensor inputs. Sensor trips to be simulated using test buttons or temporary jumpers between test points in the ODH boxes. For the following tests, the manual ON/OFF station number locations are: Station #1-at 5HODB2; Station #2-at 5HODB1; Station #3-at 5HODB3; Station #4-at 5HODB-4; Station #5 (ALL ON/OFF)- near entry door; and Station #6 (ALL ON/OFF)- near roll-up door.

2.1.1. Sensor AS5H-1; ODH box 5HODB1.

2.1.1.1. Div A check

APPLY jumper between TP 2 and TP 4 in Div A of 5HODB1	
VERIFY with Operator Interface that AS5H-1 is	TRIPPED
VERIFY that Operator Interface indicates Compressor ODH Alarm is	ON
VERIFY that the Compressor ODH Alarm in the MCR is	SOUNDING
VERIFY that supply fan HS3 is	RUNNING
VERIFY that supply fan HS4 is	RUNNING
VERIFY that exhaust fan HEF2 is	RUNNING
VERIFY that exhaust fan HEF3 is	RUNNING
VERIFY that the blue Div A strobes on all four ODH boxes are	FLASHING
VERIFY that all rotating red beacons are	ON
VERIFY that all red strobes are	FLASHING
ATTEMPT to manually turn fans OFF at Station #1 ; momentarily press OFF button	FAIL
ATTEMPT to manually turn fans OFF at Station #2 ; momentarily press OFF button	FAIL
ATTEMPT to manually turn fans OFF at Station #5 ; momentarily press OFF button	FAIL
ATTEMPT to manually turn fans OFF at Station #6 ; momentarily press OFF button	FAIL
REMOVE jumper between TP 2 and TP 4	
VERIFY with Operator Interface that AS5H-1 is	NOT TRIPPED
VERIFY that all Div A blue strobes are	OFF
VERIFY that all rotating red beacons are	OFF
VERIFY that all red strobes are	OFF
RESET ODH condition in MCR	
VERIFY that Operator Interface indicates Compressor ODH Alarm is	OFF
VERIFY that the Compressor ODH Alarm in the MCR is	NOT SOUNDING
<i>- after 90 seconds from test initiation.</i>	
VERIFY that supply fan HS3 is	OFF
VERIFY that supply fan HS4 is	OFF
VERIFY that exhaust fan HEF2 is	OFF
VERIFY that exhaust fan HEF3 is	OFF

CHECK for Div A test acceptance of **SENSOR AS5H-1** **Q**

2.0. **COMPRESSOR BLDG Oxygen Deficiency Detection and Fan Activation**

2.1.2. Sensor AS5H-2; ODH box 5HODB2.

2.1.2.1. Div A check

APPLY	jumper between TP 2 and TP 4 in Div A of 5HODB2	
VERIFY	with Operator Interface that AS5H-2 is	TRIPPED
VERIFY	that Operator Interface indicates Compressor ODH Alarm is	ON
VERIFY	that the Compressor ODH Alarm in the MCR is	SOUNDING
VERIFY	that supply fan HS1 is	RUNNING
VERIFY	that supply fan HS2 is	RUNNING
VERIFY	that exhaust fan HEF1 is	RUNNING
VERIFY	that exhaust fan HEF2 is	RUNNING
VERIFY	that the blue Div A strobes on all four ODH boxes are	FLASHING
VERIFY	that all rotating red beacons are	ON
VERIFY	that all red strobes are	FLASHING
ATTEMPT	to manually turn fans OFF at Station #1 momentarily press OFF button	FAIL
ATTEMPT	to manually turn fans OFF at Station #2 ; momentarily press OFF button	FAIL
ATTEMPT	to manually turn fans OFF at Station #5 ; momentarily press OFF button	FAIL
ATTEMPT	to manually turn fans OFF at Station #6 ; momentarily press OFF button	FAIL
REMOVE	jumper between TP 2 and TP 4	
VERIFY	with Operator Interface that AS5H-2 is	NOT TRIPPED
VERIFY	that all Div A blue strobes are	OFF
VERIFY	that all rotating red beacons are	OFF
VERIFY	that all red strobes are	OFF
RESET	ODH condition in MCR	
VERIFY	that Operator Interface indicates Compressor ODH Alarm is	OFF
VERIFY	that the Compressor ODH Alarm in the MCR is	NOT SOUNDING
	<i>- after 90 seconds from test initiation,</i>	
VERIFY	that supply fan HS1 is	OFF
VERIFY	that supply fan HS2 is	OFF
VERIFY	that exhaust fan HEF1 is	OFF
VERIFY	that exhaust fan HEF2 is	OFF

CHECK for Div A test acceptance of SENSOR AS5H-2

Q

2.0. COMPRESSOR BLDG Oxygen Deficiency Detection and Fan Activation2.1.2.2. **Div B** check

APPLY	jumper between TP 2 and TP 4 in Div B of 5HODB2	
VERIFY	with Operator Interface that AS5H-2 is	TRIPPED
VERIFY	that Operator Interface indicates Compressor ODH Alarm is	ON
VERIFY	that the Compressor ODH Alarm in the MCR is	SOUNDING
VERIFY	that supply fan HS1 is	RUNNING
VERIFY	that supply fan HS2 is	RUNNING
VERIFY	that exhaust fan HEF1 is	RUNNING
VERIFY	that exhaust fan HEF2 is	RUNNING
VERIFY	that the blue Div B strobes on all four ODH boxes are	FLASHING
VERIFY	that all rotating red beacons are	ON
VERIFY	that all red strobes are	FLASHING
ATTEMPT	to manually turn fans OFF at Station #1 momentarily press OFF button	FAIL
ATTEMPT	to manually turn fans OFF at Station #2 ; momentarily press OFF button	FAIL
ATTEMPT	to manually turn fans OFF at Station #5 ; momentarily press OFF button	FAIL
ATTEMPT	to manually turn fans OFF at Station #6 ; momentarily press OFF button	FAIL
REMOVE	jumper between TP 2 and TP 4	
VERIFY	with Operator Interface that AS5H-2 is	NOT TRIPPED
VERIFY	that all Div B blue strobes are	OFF
VERIFY	that all rotating red beacons are	OFF
VERIFY	that all red strobes are	OFF
RESET	ODH condition in MCR	
VERIFY	that Operator Interface indicates Compressor ODH Alarm is	OFF
VERIFY	that the Compressor ODH Alarm in the MCR is	NOT SOUNDING
	<i>- after 90 seconds from test initiation,</i>	
VERIFY	that supply fan HS1 is	OFF
VERIFY	that supply fan HS2 is	OFF
VERIFY	that exhaust fan HEF1 is	OFF
VERIFY	that exhaust fan HEF2 is	OFF

CHECK for **Div B** test acceptance of **SENSOR AS5H-2**

Q

2.0. COMPRESSOR BLDG Oxygen Deficiency Detection and Fan Activation
2.1.3. Sensor AS5H-3; ODH box 5HODB3.
2.1.3.1. Div A check

APPLY	jumper between TP 2 and TP 4 in Div A of 5HODB3	
VERIFY	with Operator Interface that AS5H-3 is	TRIPPED
VERIFY	that Operator Interface indicates Compressor ODH Alarm is	ON
VERIFY	that the Compressor ODH Alarm in the MCR is	SOUNDING
VERIFY	that supply fan HS4 is	RUNNING
VERIFY	that supply fan HS5 is	RUNNING
VERIFY	that exhaust fan HEF3 is	RUNNING
VERIFY	that exhaust fan HEF4 is	RUNNING
VERIFY	that the blue Div A strobes on all four ODH boxes are	FLASHING
VERIFY	that all rotating red beacons are	ON
VERIFY	that all red strobes are	FLASHING
ATTEMPT	to manually turn fans OFF at Station #3 momentarily press OFF button	FAIL
ATTEMPT	to manually turn fans OFF at Station #4 ; momentarily press OFF button	FAIL
ATTEMPT	to manually turn fans OFF at Station #5 ; momentarily press OFF button	FAIL
ATTEMPT	to manually turn fans OFF at Station #6 ; momentarily press OFF button	FAIL
REMOVE	jumper between TP 2 and TP 4	
VERIFY	with Operator Interface that AS5H-3 is	NOT TRIPPED
VERIFY	that per 1005H PLC box, Div A , block I/O A1, IN 2 LED ON AS5H-3 is	NOT TRIPPED
VERIFY	that all Div A blue strobes are	OFF
VERIFY	that all rotating red beacons are	OFF
VERIFY	that all red strobes are	OFF
RESET	ODH condition in MCR	
VERIFY	that Operator Interface indicates Compressor ODH Alarm is	OFF
VERIFY	that the Compressor ODH Alarm in the MCR is	NOT SOUNDING
	 <i>- after 90 seconds from test initiation,</i>	
VERIFY	that supply fan HS4 is	OFF
VERIFY	that supply fan HS5 is	OFF
VERIFY	that exhaust fan HEF3 is	OFF
VERIFY	that exhaust fan HEF4 is	OFF

CHECK for **Div A** test acceptance of **SENSOR AS5H-3**
Q

2.0. COMPRESSOR BLDG Oxygen Deficiency Detection and Fan Activation

2.1.3.2. Div B check

APPLY	jumper between TP 2 and TP 4 in Div B of 5HODB3	
VERIFY	with Operator Interface that AS5H-3 is	TRIPPED
VERIFY	that Operator Interface indicates Compressor ODH Alarm is	ON
VERIFY	that the Compressor ODH Alarm in the MCR is	SOUNDING
VERIFY	that supply fan HS4 is	RUNNING
VERIFY	that supply fan HS5 is	RUNNING
VERIFY	that exhaust fan HEF3 is	RUNNING
VERIFY	that exhaust fan HEF4 is	RUNNING
VERIFY	that the blue Div B strobes on all four ODH boxes are	FLASHING
VERIFY	that all rotating red beacons are	ON
VERIFY	that all red strobes are	FLASHING
ATTEMPT	to manually turn fans OFF at Station #3 momentarily press OFF button	FAIL
ATTEMPT	to manually turn fans OFF at Station #4 ; momentarily press OFF button	FAIL
ATTEMPT	to manually turn fans OFF at Station #5 ; momentarily press OFF button	FAIL
ATTEMPT	to manually turn fans OFF at Station #6 ; momentarily press OFF button	FAIL
REMOVE	jumper between TP 2 and TP 4	
VERIFY	with Operator Interface that AS5H-3 is	NOT TRIPPED
VERIFY	that per 1005H PLC box, Div B , block I/O A1, IN 2 LED ON AS5H-3 is	NOT TRIPPED
VERIFY	that all Div A blue strobes are	OFF
VERIFY	that all rotating red beacons are	OFF
VERIFY	that all red strobes are	OFF
RESET	ODH condition in MCR	
VERIFY	that Operator Interface indicates Compressor ODH Alarm is	OFF
VERIFY	that the Compressor ODH Alarm in the MCR is	NOT SOUNDING
	<i>- after 90 seconds from test initiation,</i>	
VERIFY	that supply fan HS4 is	OFF
VERIFY	that supply fan HS5 is	OFF
VERIFY	that exhaust fan HEF3 is	OFF
VERIFY	that exhaust fan HEF4 is	OFF

CHECK for Div B test acceptance of SENSOR AS5H-3

Q

2.0. **COMPRESSOR BLDG** Oxygen Deficiency Detection and Fan Activation

2.1.4. Sensor AS5H-4; ODH box 5HODB4.

2.1.4.1. Div A check

APPLY	jumper between TP 2 and TP 4 in Div A of 5HODB4	
VERIFY	with Operator Interface that AS5H-4 is	TRIPPED
VERIFY	that Operator Interface indicates Compressor ODH Alarm is	ON
VERIFY	that the Compressor ODH Alarm in the MCR is	SOUNDING
VERIFY	that supply fan HS4 is	RUNNING
VERIFY	that supply fan HS5 is	RUNNING
VERIFY	that exhaust fan HEF3 is	RUNNING
VERIFY	that exhaust fan HEF4 is	RUNNING
VERIFY	that the blue Div A strobes on all four ODH boxes are	FLASHING
VERIFY	that all rotating red beacons are	ON
VERIFY	that all red strobes are	FLASHING
ATTEMPT	to manually turn fans OFF at Station #3 ; momentarily press OFF button	FAIL
ATTEMPT	to manually turn fans OFF at Station #4 momentarily press OFF button	FAIL
ATTEMPT	to manually turn fans OFF at Station #5 ; momentarily press OFF button	FAIL
ATTEMPT	to manually turn fans OFF at Station #6 ; momentarily press OFF button	FAIL
REMOVE	jumper between TP 2 and TP 4	
VERIFY	with Operator Interface that AS5H-4 is	NOT TRIPPED
VERIFY	that all Div A blue strobes are	OFF
VERIFY	that all rotating red beacons are	OFF
VERIFY	that all red strobes are	OFF
RESET	ODH condition in MCR	
VERIFY	that Operator Interface indicates Compressor ODH Alarm is	OFF
VERIFY	that the Compressor ODH Alarm in the MCR is	NOT SOUNDING
	<i>- after 90 seconds from test initiation,</i>	
VERIFY	that supply fan HS4 is	OFF
VERIFY	that supply fan HS5 is	OFF
VERIFY	that exhaust fan HEF3 is	OFF
VERIFY	that exhaust fan HEF4 is	OFF

CHECK for Div A test acceptance of SENSOR AS5H-4

Q

2.0. COMPRESSOR BLDG Oxygen Deficiency Detection and Fan Activation
2.1.4.2. Div B check

APPLY	jumper between TP 2 and TP 4 in Div B of 5HODB4	
VERIFY	with Operator Interface that AS5H-4 is	TRIPPED
VERIFY	that Operator Interface indicates Compressor ODH Alarm is	ON
VERIFY	that the Compressor ODH Alarm in the MCR is	SOUNDING
VERIFY	that supply fan HS4 is	RUNNING
VERIFY	that supply fan HS5 is	RUNNING
VERIFY	that exhaust fan HEF3 is	RUNNING
VERIFY	that exhaust fan HEF4 is	RUNNING
VERIFY	that the blue Div B strobes on all four ODH boxes are	FLASHING
VERIFY	that all rotating red beacons are	ON
VERIFY	that all red strobes are	FLASHING
ATTEMPT	to manually turn fans OFF at Station #3 ; momentarily press OFF button	FAIL
ATTEMPT	to manually turn fans OFF at Station #4 momentarily press OFF button	FAIL
ATTEMPT	to manually turn fans OFF at Station #5 ; momentarily press OFF button	FAIL
ATTEMPT	to manually turn fans OFF at Station #6 ; momentarily press OFF button	FAIL
REMOVE	jumper between TP 2 and TP 4	
VERIFY	with Operator Interface that AS5H-4 is	NOT TRIPPED
VERIFY	that all Div B blue strobes are	OFF
VERIFY	that all rotating red beacons are	OFF
VERIFY	that all red strobes are	OFF
RESET	ODH condition in MCR	
VERIFY	that Operator Interface indicates Compressor ODH Alarm is	OFF
VERIFY	that the Compressor ODH Alarm in the MCR is	NOT SOUNDING
	 <i>- after 90 seconds from test initiation,</i>	
VERIFY	that supply fan HS4 is	OFF
VERIFY	that supply fan HS5 is	OFF
VERIFY	that exhaust fan HEF3 is	OFF
VERIFY	that exhaust fan HEF4 is	OFF

CHECK for **Div B** test acceptance of **SENSOR AS5H-4**
Q
Sign and date for test acceptance of **PLC response to individual Sensors** _____ / / _____



2.0. COMPRESSOR BLDG Oxygen Deficiency Detection and Fan Activation

2.2. **Check individual Div A & B PLC response to a sensor that has been tripped for more than 10 minutes.** Choose ONE of either 5HODB1, 5HODB2, 5HODB3 or 5HODB4 for this test. Sensor trip to be simulated using test button or temporary jumper between test points in the ODH box.

RECORD ODH box chosen for this test _____

2.2.1. **Div A check**

APPLY jumper between **TP 2 and TP 4** in Div A of the ODH box under test
VERIFY with Operator Interface that the associated sensor has
VERIFY that supply fan **HS3** is
VERIFY that supply fan **HS4** is
VERIFY that exhaust fan **HEF2** is

TRIPPED
RUNNING
RUNNING
RUNNING

Approximately 10 minutes from test initiation:

VERIFY that supply fan **HS1** is
VERIFY that supply fan **HS2** is
VERIFY that supply fan **HS3** is
VERIFY that supply fan **HS4** is
VERIFY that supply fan **HS5** is
VERIFY that exhaust fan **HEF1** is
VERIFY that exhaust fan **HEF2** is
VERIFY that exhaust fan **HEF3** is
VERIFY that exhaust fan **HEF4** is

RUNNING
RUNNING
RUNNING
RUNNING
RUNNING
RUNNING
RUNNING
RUNNING
RUNNING

REMOVE jumper between **TP 2 and TP 4**
VERIFY with Operator Interface that the associated sensor is
VERIFY that supply fan **HS1** is
VERIFY that supply fan **HS2** is
VERIFY that supply fan **HS3** is
VERIFY that supply fan **HS4** is
VERIFY that supply fan **HS5** is
VERIFY that exhaust fan **HEF1** is
VERIFY that exhaust fan **HEF2** is
VERIFY that exhaust fan **HEF3** is
VERIFY that exhaust fan **HEF4** is
RESET **ODH** condition in **MCR**

NOT TRIPPED
OFF
OFF
OFF
OFF
OFF
OFF
OFF
OFF
OFF
OFF

CHECK for Div A test acceptance of **10 minute timer** for tripped sensor

Q

2.0. COMPRESSOR BLDG Oxygen Deficiency Detection and Fan Activation

2.2.2. Div B check

APPLY	jumper between TP 2 and TP 4 in Div A of the ODH box under test	
VERIFY	with Operator Interface that the associated sensor has	TRIPPED
VERIFY	that supply fan HS3 is	RUNNING
VERIFY	that supply fan HS4 is	RUNNING
VERIFY	that exhaust fan HEF2 is	RUNNING

Approximately 10 minutes from test initiation:

VERIFY	that supply fan HS1 is	RUNNING
VERIFY	that supply fan HS2 is	RUNNING
VERIFY	that supply fan HS3 is	RUNNING
VERIFY	that supply fan HS4 is	RUNNING
VERIFY	that supply fan HS5 is	RUNNING
VERIFY	that exhaust fan HEF1 is	RUNNING
VERIFY	that exhaust fan HEF2 is	RUNNING
VERIFY	that exhaust fan HEF3 is	RUNNING
VERIFY	that exhaust fan HEF4 is	RUNNING

REMOVE	jumper between TP 2 and TP 4	
VERIFY	with Operator Interface that the associated sensor is	NOT TRIPPED
VERIFY	that supply fan HS1 is	OFF
VERIFY	that supply fan HS2 is	OFF
VERIFY	that supply fan HS3 is	OFF
VERIFY	that supply fan HS4 is	OFF
VERIFY	that supply fan HS5 is	OFF
VERIFY	that exhaust fan HEF1 is	OFF
VERIFY	that exhaust fan HEF2 is	OFF
VERIFY	that exhaust fan HEF3 is	OFF
VERIFY	that exhaust fan HEF4 is	OFF
RESET	ODH condition in MCR	

CHECK for **Div B** test acceptance of **10 minute timer** for tripped sensor **Q**



2.0. COMPRESSOR BLDG Oxygen Deficiency Detection and Fan Activation

2.3. Check manual fan ON/OFF controls for correct operation.

2.3.1. At fan "ON/OFF" station #5 (ALL ON/OFF), near entry door.

- PRESS fan ON button
- BEGIN 90 second timeout counter
- VERIFY that HS1 fan is ON
- VERIFY that HS2 fan is ON
- VERIFY that HS3 fan is ON
- VERIFY that HS4 fan is ON
- VERIFY that HS5 fan is ON
- VERIFY that HEF1 fan is ON
- VERIFY that HEF2 fan is ON
- VERIFY that HEF3 fan is ON
- VERIFY that HEF4 fan is ON
- PRESS fan OFF button;
- AFTER 90 seconds from ON command,
- VERIFY that HS1 fan is OFF
- VERIFY that HS2 fan is OFF
- VERIFY that HS3 fan is OFF
- VERIFY that HS4 fan is OFF
- VERIFY that HS5 fan is OFF
- VERIFY that HEF1 fan is OFF
- VERIFY that HEF2 fan is OFF
- VERIFY that HEF3 fan is OFF
- VERIFY that HEF4 fan is OFF

CHECK for test acceptance of Manual Station #5 Q

2.3.2. At fan "ON/OFF" station #6 (ALL ON/OFF), near Roll-up door.

- PRESS fan ON button
- BEGIN 90 second timeout counter
- VERIFY that HS1 fan is ON
- VERIFY that HS2 fan is ON
- VERIFY that HS3 fan is ON
- VERIFY that HS4 fan is ON
- VERIFY that HS5 fan is ON
- VERIFY that HEF1 fan is ON
- VERIFY that HEF2 fan is ON
- VERIFY that HEF3 fan is ON
- VERIFY that HEF4 fan is ON
- PRESS fan OFF button;
- AFTER 90 seconds from ON command,
- VERIFY that HS1 fan is OFF
- VERIFY that HS2 fan is OFF
- VERIFY that HS3 fan is OFF
- VERIFY that HS4 fan is OFF
- VERIFY that HS5 fan is OFF
- VERIFY that HEF1 fan is OFF
- VERIFY that HEF2 fan is OFF
- VERIFY that HEF3 fan is OFF
- VERIFY that HEF4 fan is OFF

CHECK for test acceptance of Manual Station #6 Q

2.4. Test sensor trip to application of Helium.

2.0. COMPRESSOR BLDG Oxygen Deficiency Detection and Fan Activation

2.4.1. For the sensors in the table below, perform the following test: (Indicate by a check mark in each box that the test has been successfully performed)

- | | | |
|---------------|---|------------------------------|
| RECORD | Sensor analog voltage from the Operator Interface | |
| RECORD | derived oxygen concentration from the Operator Interface | |
| FLOW | gas (Helium or Nitrogen) over detector until it | ACTIVATES
TRIPPED |
| VERIFY | with Operator Interfaces that Both Div A & B are | |
| RECORD | approximate oxygen concentration when alarm trips (~18.0%) | |
| VERIFY | that MCR Refrigerator ODH Alarm | SOUNDS
CLEAR |
| REMOVE | gas from detector and wait until it is | |
| RESET | ODH condition from MCR | |

SENSOR	RECORD SENSOR ANALOG VOLTAGE	RECORD DERIVED O2 CONCENTRATION	DIV A TRIPS	DIV B TRIPS	RECORD TRIP POINT	MCR ODH ALARM SOUNDS
AS5Y-1						
AS5Y-2						
AS5Y-3						
AS5H-1						

Sign and date for test acceptance of **Helium Detection, all sensors** _____ / /

Sign and date for test acceptance of **all 1005H Compressor Bldg tests** _____ / /

Fill out Reading Acknowledgment Form