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C-A OPERATIONS PROCEDURES MANUAL

ATTACHMENT

4.120.15.h Refrigerator Building 1005R (PEER 19) ODH Tests

C-A-OPM Procedures in which this Attachment is used.		
4.120.15		

Hand Processed Changes

<u>HPC No.</u>	<u>Date</u>	<u>Page Nos.</u>	<u>Initials</u>
_____	_____	_____	_____
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Approved: \_\_\_\_\_ *Signature on File* \_\_\_\_\_  
 Collider-Accelerator Department Chairman Date

V. Castillo

**4.120.15.h Refrigerator Building 1005R (PEER 19) ODH Tests**

**PASS ANNUAL ACCEPTANCE TEST PROTOCOL**

**Division A Software Filename and Checksum: Title: \_\_\_\_\_ Checksum: \_\_\_\_\_**

**Division B Software Filename and Checksum: Title: \_\_\_\_\_ Checksum: \_\_\_\_\_**

**Initial testing complete:**

**Test Team Leader's Name (Print): \_\_\_\_\_ Life Number: \_\_\_\_\_**

**Test Team Leader's Name (Sign): \_\_\_\_\_ Date: \_\_\_\_/\_\_\_\_/\_\_\_\_**

**Acceptance test procedure complete (following repairs and retesting if required):**

**Test Team Leader's Name (Print): \_\_\_\_\_ Life Number: \_\_\_\_\_**

**Test Team Leader's Name (Sign): \_\_\_\_\_ Date: \_\_\_\_/\_\_\_\_/\_\_\_\_**

**Test results reviewed by:**

**Safety Section Head's Name (Print): \_\_\_\_\_ Life Number: \_\_\_\_\_**

**Safety Section Head's Name (Sign): \_\_\_\_\_ Date: \_\_\_\_/\_\_\_\_/\_\_\_\_**

**Test results accepted by Radiation Safety Committee:**

**RSC Member's Name (Print): \_\_\_\_\_ Life Number: \_\_\_\_\_**

**RSC Member's Name (Sign): \_\_\_\_\_ Date: \_\_\_\_/\_\_\_\_/\_\_\_\_**

- 1.1 Conduct a visual check on Peer 19 ODH boxes following Table 1 below  
 ✓ = ok, x = problem

Note: ODH units 5Y-ODB1 and 5Y-ODB2 located in the ceiling are no longer in service.

ODH BOXES	Verify mechan condn. ok	Verify elec. condn. ok	Crash/ODH boxes only				Verify all X's corrected
			Division A		Division B		
			Lcd Rdg	Tp2 – Tp4 Vltg	Lcd Rdg	Tp2 – Tp4 Vltg	
5Y-ODB3	<input type="checkbox"/>	<input type="checkbox"/>	%	V	%	V	<input type="checkbox"/>
5Y-ODB4	<input type="checkbox"/>	<input type="checkbox"/>	%	V	%	V	<input type="checkbox"/>
5Y-ODB5	<input type="checkbox"/>	<input type="checkbox"/>	%	V	%	V	<input type="checkbox"/>
5Y-ODB6 Sampling System	<input type="checkbox"/>	<input type="checkbox"/>	%	V	%	V	<input type="checkbox"/>

Table 1 – Summary of visual check on ODH boxes in the Refrigerator Building

- Check for acceptance of visual check on Peer 19 ODH boxes

- 1.2 Verification of valid calibration of ODH sensors in Peer 19, following Table 2 below  
 ✓ = ok, x = problem

Note: ODH sensors AS5Y-1 and AS5Y-2 located in the ceiling are no longer in service.

ODH sensor	Verify valid calibration	Record calibration date	Verify all x's corrected	Record new calibration date
AS5Y-3	<input type="checkbox"/>	____/____/____	<input type="checkbox"/>	____/____/____
AS5Y-4	<input type="checkbox"/>	____/____/____	<input type="checkbox"/>	____/____/____
AS5Y-5	<input type="checkbox"/>	____/____/____	<input type="checkbox"/>	____/____/____
AS5Y-6 Sampling Sensor	<input type="checkbox"/>	____/____/____	<input type="checkbox"/>	____/____/____

Table 2 – Verification of valid calibration of ODH sensors in Refrigerator Building

- Check for acceptance of Verification of valid calibration of ODH sensors in Peer 19

**1.3 Jumper Test of ODH sensor AS5Y-3 in 5Y-ODB3**

	<b>JUMPER</b>	<b>Tp2 and Tp4 on the Div A and Div B Pcb's in 5Y-ODB3</b>	
<input type="checkbox"/>	<b>VERIFY</b>	<b>MCR sees AS5Y-3 Div A <input type="checkbox"/> and Div B <input type="checkbox"/></b>	<b>ODH</b>
<input type="checkbox"/>	<b>VERIFY</b>	<b>MCR sees Refrigerator ODH alarm on Cryo page is</b>	<b>ON</b>
<input type="checkbox"/>	<b>VERIFY</b>	<b>Div A &amp; B Blue strobes &amp; Alarms on: 5Y-ODB1 <input type="checkbox"/>, 5Y-ODB2 <input type="checkbox"/>, 5Y-ODB3 <input type="checkbox"/>, 5Y-ODB4 <input type="checkbox"/>, 5Y-ODB5 <input type="checkbox"/> and 5Y-ODB6 <input type="checkbox"/> are</b>	<b>ON</b>
<input type="checkbox"/>	<b>VERIFY</b>	<b>All red Strobes are</b>	<b>FLASHING</b>
<input type="checkbox"/>	<b>VERIFY</b>	<b>All rotating red Beacons are</b>	<b>ON</b>
<input type="checkbox"/>	<b>VERIFY</b>	<b>MCR sees Refrigerator Fans are</b>	<b>ON</b>
<input type="checkbox"/>	<b>VERIFY</b>	<b>Fan REF1 is</b>	<b>ON</b>
<input type="checkbox"/>	<b>VERIFY</b>	<b>Fan REF2 is</b>	<b>ON</b>
<input type="checkbox"/>	<b>VERIFY</b>	<b>Vent RAV1 is</b>	<b>OPENED</b>
<input type="checkbox"/>	<b>VERIFY</b>	<b>Vent RAV2 is</b>	<b>OPENED</b>
<input type="checkbox"/>	<b>VERIFY</b>	<b>Attempt to turn fans off at Stations: #1 <input type="checkbox"/>, #2 <input type="checkbox"/></b>	<b>FAIL</b>
	<b>TURN</b>	<b>Div A Bypass Switch to Bypass</b>	
<input type="checkbox"/>	<b>VERIFY</b>	<b>All Div A Strobes and Beacons</b>	<b>STOP</b>
	<b>TURN</b>	<b>Div A Bypass Switch from Bypass</b>	
<input type="checkbox"/>	<b>VERIFY</b>	<b>All Div A Strobes and Beacons</b>	<b>CONTINUE</b>
	<b>TURN</b>	<b>Div B Bypass Switch to Bypass</b>	
<input type="checkbox"/>	<b>VERIFY</b>	<b>All Div B Strobes and Beacons</b>	<b>STOP</b>
	<b>TURN</b>	<b>Div B Bypass Switch from Bypass</b>	
<input type="checkbox"/>	<b>VERIFY</b>	<b>All Div B Strobes and Beacons</b>	<b>CONTINUE</b>
	<b>REMOVE</b>	<b>Jumper from the Div A and Div B Pcb's in 5Y-ODB3</b>	
<input type="checkbox"/>	<b>VERIFY</b>	<b>MCR sees AS5Y-3 Div A <input type="checkbox"/> and Div B <input type="checkbox"/></b>	<b>OK</b>
<input type="checkbox"/>	<b>VERIFY</b>	<b>Div A &amp; B Blue strobes &amp; Alarms on: 5Y-ODB1 <input type="checkbox"/>, 5Y-ODB2 <input type="checkbox"/>, 5Y-ODB3 <input type="checkbox"/>, 5Y-ODB4 <input type="checkbox"/>, 5Y-ODB5 <input type="checkbox"/> and 5Y-ODB6 <input type="checkbox"/> are</b>	<b>OFF</b>
<input type="checkbox"/>	<b>VERIFY</b>	<b>All red Strobes are</b>	<b>OFF</b>
<input type="checkbox"/>	<b>VERIFY</b>	<b>All rotating red Beacons are</b>	<b>OFF</b>
	<b>RESET</b>	<b>ODH in MCR</b>	
<input type="checkbox"/>	<b>VERIFY</b>	<b>MCR sees Refrigerator ODH alarm on Cryo page is</b>	<b>OK</b>
	<b>AFTER</b>	<b>&gt; 90 Secs</b>	
<input type="checkbox"/>	<b>VERIFY</b>	<b>MCR sees Refrigerator Fans are</b>	<b>OFF</b>
<input type="checkbox"/>	<b>VERIFY</b>	<b>Fan REF1 is</b>	<b>OFF</b>
<input type="checkbox"/>	<b>VERIFY</b>	<b>Fan REF2 is</b>	<b>OFF</b>
<input type="checkbox"/>	<b>VERIFY</b>	<b>Vent RAV1 is</b>	<b>CLOSED</b>
<input type="checkbox"/>	<b>VERIFY</b>	<b>Vent RAV2 is</b>	<b>CLOSED</b>
<input type="checkbox"/>		<b>Check for acceptance of Jumper Test of ODH sensor AS5Y-3 in 5Y-ODB3</b>	

**1.4 Jumper Test of ODH sensor AS5Y-4 in 5Y-ODB4**

	<b>JUMPER</b>	<b>Tp2 and Tp4 on the Div A and Div B Pcb's in 5Y-ODB4</b>	
<input type="checkbox"/>	<b>VERIFY</b>	<b>MCR sees AS5Y-4 Div A <input type="checkbox"/> and Div B <input type="checkbox"/></b>	<b>ODH</b>
<input type="checkbox"/>	<b>VERIFY</b>	<b>MCR sees Refrigerator ODH alarm on Cryo page is</b>	<b>ON</b>
<input type="checkbox"/>	<b>VERIFY</b>	<b>Div A &amp; B Blue strobes &amp; Alarms on: 5Y-ODB1 <input type="checkbox"/>, 5Y-ODB2 <input type="checkbox"/>, 5Y-ODB3 <input type="checkbox"/>, 5Y-ODB4 <input type="checkbox"/>, 5Y-ODB5 <input type="checkbox"/> and 5Y-ODB6 <input type="checkbox"/> are</b>	<b>ON</b>
<input type="checkbox"/>	<b>VERIFY</b>	<b>All red Strobes are</b>	<b>FLASHING</b>
<input type="checkbox"/>	<b>VERIFY</b>	<b>All rotating red Beacons are</b>	<b>ON</b>
<input type="checkbox"/>	<b>VERIFY</b>	<b>MCR sees Refrigerator Fans are</b>	<b>ON</b>
<input type="checkbox"/>	<b>VERIFY</b>	<b>Fan REF1 is</b>	<b>ON</b>
<input type="checkbox"/>	<b>VERIFY</b>	<b>Fan REF2 is</b>	<b>ON</b>
<input type="checkbox"/>	<b>VERIFY</b>	<b>Vent RAV1 is</b>	<b>OPENED</b>
<input type="checkbox"/>	<b>VERIFY</b>	<b>Vent RAV2 is</b>	<b>OPENED</b>
<input type="checkbox"/>	<b>VERIFY</b>	<b>Attempt to turn fans off at Stations: #1 <input type="checkbox"/>, #2 <input type="checkbox"/></b>	<b>FAIL</b>
	<b>TURN</b>	<b>Div A Bypass Switch to Bypass</b>	
<input type="checkbox"/>	<b>VERIFY</b>	<b>All Div A Strobes and Beacons</b>	<b>STOP</b>
	<b>TURN</b>	<b>Div A Bypass Switch from Bypass</b>	
<input type="checkbox"/>	<b>VERIFY</b>	<b>All Div A Strobes and Beacons</b>	<b>CONTINUE</b>
	<b>TURN</b>	<b>Div B Bypass Switch to Bypass</b>	
<input type="checkbox"/>	<b>VERIFY</b>	<b>All Div B Strobes and Beacons</b>	<b>STOP</b>
	<b>TURN</b>	<b>Div B Bypass Switch from Bypass</b>	
<input type="checkbox"/>	<b>VERIFY</b>	<b>All Div B Strobes and Beacons</b>	<b>CONTINUE</b>
	<b>REMOVE</b>	<b>Jumper from the Div A and Div B Pcb's in 5Y-ODB4</b>	
<input type="checkbox"/>	<b>VERIFY</b>	<b>MCR sees AS5Y-4 Div A <input type="checkbox"/> and Div B <input type="checkbox"/></b>	<b>OK</b>
<input type="checkbox"/>	<b>VERIFY</b>	<b>Div A &amp; B Blue strobes &amp; Alarms on: 5Y-ODB1 <input type="checkbox"/>, 5Y-ODB2 <input type="checkbox"/>, 5Y-ODB3 <input type="checkbox"/>, 5Y-ODB4 <input type="checkbox"/>, 5Y-ODB5 <input type="checkbox"/> and 5Y-ODB6 <input type="checkbox"/> are</b>	<b>OFF</b>
<input type="checkbox"/>	<b>VERIFY</b>	<b>All red Strobes are</b>	<b>OFF</b>
<input type="checkbox"/>	<b>VERIFY</b>	<b>All rotating red Beacons are</b>	<b>OFF</b>
	<b>RESET</b>	<b>ODH in MCR</b>	
<input type="checkbox"/>	<b>VERIFY</b>	<b>MCR sees Refrigerator ODH alarm on Cryo page is</b>	<b>OK</b>
	<b>AFTER</b>	<b>&gt; 90 Secs</b>	
<input type="checkbox"/>	<b>VERIFY</b>	<b>MCR sees Refrigerator Fans are</b>	<b>OFF</b>
<input type="checkbox"/>	<b>VERIFY</b>	<b>Fan REF1 is</b>	<b>OFF</b>
<input type="checkbox"/>	<b>VERIFY</b>	<b>Fan REF2 is</b>	<b>OFF</b>
<input type="checkbox"/>	<b>VERIFY</b>	<b>Vent RAV1 is</b>	<b>CLOSED</b>
<input type="checkbox"/>	<b>VERIFY</b>	<b>Vent RAV2 is</b>	<b>CLOSED</b>
<input type="checkbox"/>		<b>Check for acceptance of Jumper Test of ODH sensor AS5Y-4 in 5Y-ODB4</b>	

**1.5 Jumper Test of ODH sensor AS5Y-5 in 5Y-ODB5**

	<b>JUMPER</b>	<b>Tp2 and Tp4 on the Div A and Div B Pcb's in 5Y-ODB5</b>	
<input type="checkbox"/>	<b>VERIFY</b>	<b>MCR sees AS5Y-5 Div A <input type="checkbox"/> and Div B <input type="checkbox"/></b>	<b>ODH</b>
<input type="checkbox"/>	<b>VERIFY</b>	<b>MCR sees Refrigerator ODH alarm on Cryo page is</b>	<b>ON</b>
<input type="checkbox"/>	<b>VERIFY</b>	<b>Div A &amp; B Blue strobes &amp; Alarms on: 5Y-ODB1 <input type="checkbox"/>, 5Y-ODB2 <input type="checkbox"/>, 5Y-ODB3 <input type="checkbox"/>, 5Y-ODB4 <input type="checkbox"/>, 5Y-ODB5 <input type="checkbox"/> and 5Y-ODB6 <input type="checkbox"/> are</b>	<b>ON</b>
<input type="checkbox"/>	<b>VERIFY</b>	<b>All red Strobes are</b>	<b>FLASHING</b>
<input type="checkbox"/>	<b>VERIFY</b>	<b>All rotating red Beacons are</b>	<b>ON</b>
<input type="checkbox"/>	<b>VERIFY</b>	<b>MCR sees Refrigerator Fans are</b>	<b>ON</b>
<input type="checkbox"/>	<b>VERIFY</b>	<b>Fan REF1 is</b>	<b>ON</b>
<input type="checkbox"/>	<b>VERIFY</b>	<b>Fan REF2 is</b>	<b>ON</b>
<input type="checkbox"/>	<b>VERIFY</b>	<b>Vent RAV1 is</b>	<b>OPENED</b>
<input type="checkbox"/>	<b>VERIFY</b>	<b>Vent RAV2 is</b>	<b>OPENED</b>
<input type="checkbox"/>	<b>VERIFY</b>	<b>Attempt to turn fans off at Stations: #1 <input type="checkbox"/>, #2 <input type="checkbox"/></b>	<b>FAIL</b>
	<b>TURN</b>	<b>Div A Bypass Switch to Bypass</b>	
<input type="checkbox"/>	<b>VERIFY</b>	<b>All Div A Strobes and Beacons</b>	<b>STOP</b>
	<b>TURN</b>	<b>Div A Bypass Switch from Bypass</b>	
<input type="checkbox"/>	<b>VERIFY</b>	<b>All Div A Strobes and Beacons</b>	<b>CONTINUE</b>
	<b>TURN</b>	<b>Div B Bypass Switch to Bypass</b>	
<input type="checkbox"/>	<b>VERIFY</b>	<b>All Div B Strobes and Beacons</b>	<b>STOP</b>
	<b>TURN</b>	<b>Div B Bypass Switch from Bypass</b>	
<input type="checkbox"/>	<b>VERIFY</b>	<b>All Div B Strobes and Beacons</b>	<b>CONTINUE</b>
	<b>REMOVE</b>	<b>Jumper from the Div A and Div B Pcb's in 5Y-ODB5</b>	
<input type="checkbox"/>	<b>VERIFY</b>	<b>MCR sees AS5Y-5 Div A and Div B <input type="checkbox"/></b>	<b>OK</b>
<input type="checkbox"/>	<b>VERIFY</b>	<b>Div A &amp; B Blue strobes &amp; Alarms on: 5Y-ODB1 <input type="checkbox"/>, 5Y-ODB2 <input type="checkbox"/>, 5Y-ODB3 <input type="checkbox"/>, 5Y-ODB4 <input type="checkbox"/>, 5Y-ODB5 <input type="checkbox"/> and 5Y-ODB6 <input type="checkbox"/> are</b>	<b>OFF</b>
<input type="checkbox"/>	<b>VERIFY</b>	<b>All red Strobes are</b>	<b>OFF</b>
<input type="checkbox"/>	<b>VERIFY</b>	<b>All rotating red Beacons are</b>	<b>OFF</b>
	<b>RESET</b>	<b>ODH in MCR</b>	
<input type="checkbox"/>	<b>VERIFY</b>	<b>MCR sees Refrigerator ODH alarm on Cryo page is</b>	<b>OK</b>
	<b>AFTER</b>	<b>&gt; 90 Secs</b>	
<input type="checkbox"/>	<b>VERIFY</b>	<b>MCR sees Refrigerator Fans are</b>	<b>OFF</b>
<input type="checkbox"/>	<b>VERIFY</b>	<b>Fan REF1 is</b>	<b>OFF</b>
<input type="checkbox"/>	<b>VERIFY</b>	<b>Fan REF2 is</b>	<b>OFF</b>
<input type="checkbox"/>	<b>VERIFY</b>	<b>Vent RAV1 is</b>	<b>CLOSED</b>
<input type="checkbox"/>	<b>VERIFY</b>	<b>Vent RAV2 is</b>	<b>CLOSED</b>
<input type="checkbox"/>	<b>Check for acceptance of Jumper Test of ODH sensor AS5Y-5 in 5Y-ODB5</b>		

**1.6 Jumper Test of ODH sensor AS5Y-6 in 5Y-ODB6**

	<b>JUMPER</b>	<b>Tp2 and Tp4 on the Div A and Div B Pcb's in 5Y-ODB6</b>	
<input type="checkbox"/>	<b>VERIFY</b>	<b>MCR sees AS5Y-6 Div A <input type="checkbox"/> and Div B <input type="checkbox"/></b>	<b>ODH</b>
<input type="checkbox"/>	<b>VERIFY</b>	<b>MCR sees Refrigerator ODH alarm on Cryo page is</b>	<b>ON</b>
<input type="checkbox"/>	<b>VERIFY</b>	<b>Div A &amp; B Blue strobes &amp; Alarms on: 5Y-ODB1 <input type="checkbox"/>, 5Y-ODB2 <input type="checkbox"/>, 5Y-ODB3 <input type="checkbox"/>, 5Y-ODB4 <input type="checkbox"/>, 5Y-ODB5 <input type="checkbox"/> and 5Y-ODB6 <input type="checkbox"/> are</b>	<b>ON</b>
<input type="checkbox"/>	<b>VERIFY</b>	<b>All red Strobes are</b>	<b>FLASHING</b>
<input type="checkbox"/>	<b>VERIFY</b>	<b>All rotating red Beacons are</b>	<b>ON</b>
<input type="checkbox"/>	<b>VERIFY</b>	<b>MCR sees Refrigerator Fans are</b>	<b>ON</b>
<input type="checkbox"/>	<b>VERIFY</b>	<b>Fan REF1 is</b>	<b>ON</b>
<input type="checkbox"/>	<b>VERIFY</b>	<b>Fan REF2 is</b>	<b>ON</b>
<input type="checkbox"/>	<b>VERIFY</b>	<b>Vent RAV1 is</b>	<b>OPENED</b>
<input type="checkbox"/>	<b>VERIFY</b>	<b>Vent RAV2 is</b>	<b>OPENED</b>
<input type="checkbox"/>	<b>VERIFY</b>	<b>Attempt to turn fans off at Stations: #1 <input type="checkbox"/>, #2 <input type="checkbox"/></b>	<b>FAIL</b>
	<b>TURN</b>	<b>Div A Bypass Switch to Bypass</b>	
<input type="checkbox"/>	<b>VERIFY</b>	<b>All Div A Strobes and Beacons</b>	<b>STOP</b>
	<b>TURN</b>	<b>Div A Bypass Switch from Bypass</b>	
<input type="checkbox"/>	<b>VERIFY</b>	<b>All Div A Strobes and Beacons</b>	<b>CONTINUE</b>
	<b>TURN</b>	<b>Div B Bypass Switch to Bypass</b>	
<input type="checkbox"/>	<b>VERIFY</b>	<b>All Div B Strobes and Beacons</b>	<b>STOP</b>
	<b>TURN</b>	<b>Div B Bypass Switch from Bypass</b>	
<input type="checkbox"/>	<b>VERIFY</b>	<b>All Div B Strobes and Beacons</b>	<b>CONTINUE</b>
	<b>REMOVE</b>	<b>Jumper from the Div A and Div B Pcb's in 5Y-ODB6</b>	
<input type="checkbox"/>	<b>VERIFY</b>	<b>MCR sees AS5Y-6 Div A <input type="checkbox"/> and Div B <input type="checkbox"/></b>	<b>OK</b>
<input type="checkbox"/>	<b>VERIFY</b>	<b>Div A &amp; B Blue strobes &amp; Alarms on: 5Y-ODB1 <input type="checkbox"/>, 5Y-ODB2 <input type="checkbox"/>, 5Y-ODB3 <input type="checkbox"/>, 5Y-ODB4 <input type="checkbox"/>, 5Y-ODB5 <input type="checkbox"/> and 5Y-ODB6 <input type="checkbox"/> are</b>	<b>OFF</b>
<input type="checkbox"/>	<b>VERIFY</b>	<b>All red Strobes are</b>	<b>OFF</b>
<input type="checkbox"/>	<b>VERIFY</b>	<b>All rotating red Beacons are</b>	<b>OFF</b>
	<b>RESET</b>	<b>ODH in MCR</b>	
<input type="checkbox"/>	<b>VERIFY</b>	<b>MCR sees Refrigerator ODH alarm on Cryo page is</b>	<b>OK</b>
	<b>AFTER</b>	<b>&gt; 90 Secs</b>	
<input type="checkbox"/>	<b>VERIFY</b>	<b>MCR sees Refrigerator Fans are</b>	<b>OFF</b>
<input type="checkbox"/>	<b>VERIFY</b>	<b>Fan REF1 is</b>	<b>OFF</b>
<input type="checkbox"/>	<b>VERIFY</b>	<b>Fan REF2 is</b>	<b>OFF</b>
<input type="checkbox"/>	<b>VERIFY</b>	<b>Vent RAV1 is</b>	<b>CLOSED</b>
<input type="checkbox"/>	<b>VERIFY</b>	<b>Vent RAV2 is</b>	<b>CLOSED</b>
<input type="checkbox"/>		<b>Check for acceptance of Jumper Test of ODH sensor AS5Y-6 in 5Y-ODB6</b>	

**1.7 Test of Manual ON/OFF Switch at Station #1**

- PRESS** Fan **ON** button at **Station #1**
- START** **90 Sec counter**
- |                          |               |                                       |               |
|--------------------------|---------------|---------------------------------------|---------------|
| <input type="checkbox"/> | <b>VERIFY</b> | <b>MCR sees Refrigerator Fans are</b> | <b>ON</b>     |
| <input type="checkbox"/> | <b>VERIFY</b> | Fan <b>REF1</b> is                    | <b>ON</b>     |
| <input type="checkbox"/> | <b>VERIFY</b> | Fan <b>REF2</b> is                    | <b>ON</b>     |
| <input type="checkbox"/> | <b>VERIFY</b> | Vent <b>RAV1</b> is                   | <b>OPENED</b> |
| <input type="checkbox"/> | <b>VERIFY</b> | Vent <b>RAV2</b> is                   | <b>OPENED</b> |
- PRESS** Fan **OFF** button at **Station #1**
- AFTER** **> 90 Secs from ON command**
- |                          |               |                                       |               |
|--------------------------|---------------|---------------------------------------|---------------|
| <input type="checkbox"/> | <b>VERIFY</b> | <b>MCR sees Refrigerator Fans are</b> | <b>OFF</b>    |
| <input type="checkbox"/> | <b>VERIFY</b> | Fan <b>REF1</b> is                    | <b>OFF</b>    |
| <input type="checkbox"/> | <b>VERIFY</b> | Fan <b>REF2</b> is                    | <b>OFF</b>    |
| <input type="checkbox"/> | <b>VERIFY</b> | Vent <b>RAV1</b> is                   | <b>CLOSED</b> |
| <input type="checkbox"/> | <b>VERIFY</b> | Vent <b>RAV2</b> is                   | <b>CLOSED</b> |
- Check for Test Acceptance of Manual ON/OFF Switch at Station #1**

**1.8 Test of Manual ON/OFF Switch at Station #2**

- PRESS** Fan **ON** button at **Station #1**
- START** **90 Sec counter**
- |                          |               |                                       |               |
|--------------------------|---------------|---------------------------------------|---------------|
| <input type="checkbox"/> | <b>VERIFY</b> | <b>MCR sees Refrigerator Fans are</b> | <b>ON</b>     |
| <input type="checkbox"/> | <b>VERIFY</b> | Fan <b>REF1</b> is                    | <b>ON</b>     |
| <input type="checkbox"/> | <b>VERIFY</b> | Fan <b>REF2</b> is                    | <b>ON</b>     |
| <input type="checkbox"/> | <b>VERIFY</b> | Vent <b>RAV1</b> is                   | <b>OPENED</b> |
| <input type="checkbox"/> | <b>VERIFY</b> | Vent <b>RAV2</b> is                   | <b>OPENED</b> |
- PRESS** Fan **OFF** button at **Station #1**
- AFTER** **> 90 Secs from ON command**
- |                          |               |                                       |               |
|--------------------------|---------------|---------------------------------------|---------------|
| <input type="checkbox"/> | <b>VERIFY</b> | <b>MCR sees Refrigerator Fans are</b> | <b>OFF</b>    |
| <input type="checkbox"/> | <b>VERIFY</b> | Fan <b>REF1</b> is                    | <b>OFF</b>    |
| <input type="checkbox"/> | <b>VERIFY</b> | Fan <b>REF2</b> is                    | <b>OFF</b>    |
| <input type="checkbox"/> | <b>VERIFY</b> | Vent <b>RAV1</b> is                   | <b>CLOSED</b> |
| <input type="checkbox"/> | <b>VERIFY</b> | Vent <b>RAV2</b> is                   | <b>CLOSED</b> |
- Check for Test Acceptance of Manual ON/OFF Switch at Station #2**

**1.9 Test of ODH sensor AS5Y-3 in 5Y-ODB3 with gas**

	<b>FLOW</b>	<b>Helium or Nitrogen across sensor AS5Y-3</b>	
<input type="checkbox"/>	<b>VERIFY</b>	<b>MCR sees AS5Y-3 Div A and B</b>	<b>ODH</b>
	<b>RECORD</b>	<b>Oxygen trip level for Div A</b>	_____ %
	<b>RECORD</b>	<b>Oxygen trip level for Div B</b>	_____ %
<input type="checkbox"/>	<b>VERIFY</b>	<b>MCR sees Refrigerator ODH alarm on Cryo page is</b>	<b>ON</b>
<input type="checkbox"/>	<b>VERIFY</b>	<b>Div A &amp; B Blue strobes &amp; Alarms on: 5Y-ODB1 <input type="checkbox"/>, 5Y-ODB2 <input type="checkbox"/>, 5Y-ODB3 <input type="checkbox"/>, 5Y-ODB4 <input type="checkbox"/>, 5Y-ODB5 <input type="checkbox"/> and 5Y-ODB6 <input type="checkbox"/> are</b>	<b>ON</b>
<input type="checkbox"/>	<b>VERIFY</b>	<b>All red Strobes are</b>	<b>FLASHING</b>
<input type="checkbox"/>	<b>VERIFY</b>	<b>All rotating red Beacons are</b>	<b>ON</b>
<input type="checkbox"/>	<b>VERIFY</b>	<b>MCR sees Refrigerator Fans are</b>	<b>ON</b>
<input type="checkbox"/>	<b>VERIFY</b>	<b>Fan REF1 is</b>	<b>ON</b>
<input type="checkbox"/>	<b>VERIFY</b>	<b>Fan REF2 is</b>	<b>ON</b>
<input type="checkbox"/>	<b>VERIFY</b>	<b>Vent RAV1 is</b>	<b>OPENED</b>
<input type="checkbox"/>	<b>VERIFY</b>	<b>Vent RAV2 is</b>	<b>OPENED</b>
	<b>HALT</b>	<b>Flow of gas on AS5Y-3</b>	
	<b>WAIT</b>	<b>For AS5Y-3 to clear (level ~ trip-level above)</b>	
<input type="checkbox"/>	<b>VERIFY</b>	<b>MCR sees AS5Y-3 Div A <input type="checkbox"/> and Div B <input type="checkbox"/></b>	<b>OK</b>
<input type="checkbox"/>	<b>VERIFY</b>	<b>Div A &amp; B Blue strobes &amp; Alarms on: 5Y-ODB1 <input type="checkbox"/>, 5Y-ODB2 <input type="checkbox"/>, 5Y-ODB3 <input type="checkbox"/>, 5Y-ODB4 <input type="checkbox"/>, 5Y-ODB5 <input type="checkbox"/> and 5Y-ODB6 <input type="checkbox"/> are</b>	<b>OFF</b>
<input type="checkbox"/>	<b>VERIFY</b>	<b>All red Strobes are</b>	<b>OFF</b>
<input type="checkbox"/>	<b>VERIFY</b>	<b>All rotating red Beacons are</b>	<b>OFF</b>
	<b>AFTER</b>	<b>&gt; 90 Secs</b>	
<input type="checkbox"/>	<b>VERIFY</b>	<b>MCR sees Refrigerator Fans are</b>	<b>OFF</b>
<input type="checkbox"/>	<b>VERIFY</b>	<b>Fan REF1 is</b>	<b>OFF</b>
<input type="checkbox"/>	<b>VERIFY</b>	<b>Fan REF2 is</b>	<b>OFF</b>
<input type="checkbox"/>	<b>VERIFY</b>	<b>Vent RAV1 is</b>	<b>CLOSED</b>
<input type="checkbox"/>	<b>VERIFY</b>	<b>Vent RAV2 is</b>	<b>CLOSED</b>
	<b>RESET</b>	<b>Refrigerator ODH in MCR</b>	
<input type="checkbox"/>	<b>VERIFY</b>	<b>MCR sees Refrigerator ODH alarm on Cryo page is</b>	<b>OK</b>
<input type="checkbox"/>		<b>Check for Acceptance of Test of ODH sensor AS5Y-3 in 5Y-ODB3 with gas</b>	

**1.10 Test of ODH sensor AS5Y-4 in 5Y-ODB4 with gas**

<b>FLOW</b>	<b>Helium or Nitrogen across sensor AS5Y-4</b>	
<input type="checkbox"/> <b>VERIFY</b>	<b>MCR sees AS5Y-4 Div A and B</b>	<b>ODH</b>
<b>RECORD</b>	<b>Oxygen trip level for Div A</b>	_____ %
<b>RECORD</b>	<b>Oxygen trip level for Div B</b>	_____ %
<input type="checkbox"/> <b>VERIFY</b>	<b>MCR sees Refrigerator ODH alarm on Cryo page is</b>	<b>ON</b>
<input type="checkbox"/> <b>VERIFY</b>	<b>Div A &amp; B Blue strobes &amp; Alarms on: 5Y-ODB1 <input type="checkbox"/>, 5Y-ODB2 <input type="checkbox"/>, 5Y-ODB3 <input type="checkbox"/>, 5Y-ODB4 <input type="checkbox"/>, 5Y-ODB5 <input type="checkbox"/> and 5Y-ODB6 <input type="checkbox"/> are</b>	<b>ON</b>
<input type="checkbox"/> <b>VERIFY</b>	<b>All red Strobes are</b>	<b>FLASHING</b>
<input type="checkbox"/> <b>VERIFY</b>	<b>All rotating red Beacons are</b>	<b>ON</b>
<input type="checkbox"/> <b>VERIFY</b>	<b>MCR sees Refrigerator Fans are</b>	<b>ON</b>
<input type="checkbox"/> <b>VERIFY</b>	<b>Fan REF1 is</b>	<b>ON</b>
<input type="checkbox"/> <b>VERIFY</b>	<b>Fan REF2 is</b>	<b>ON</b>
<input type="checkbox"/> <b>VERIFY</b>	<b>Vent RAV1 is</b>	<b>OPENED</b>
<input type="checkbox"/> <b>VERIFY</b>	<b>Vent RAV2 is</b>	<b>OPENED</b>
<b>HALT</b>	<b>Flow of gas on AS5Y-4</b>	
<b>WAIT</b>	<b>For AS5Y-4 to clear (level ~ trip-level above)</b>	
<input type="checkbox"/> <b>VERIFY</b>	<b>MCR sees AS5Y-4 Div A <input type="checkbox"/> and Div B <input type="checkbox"/></b>	<b>OK</b>
<input type="checkbox"/> <b>VERIFY</b>	<b>Div A &amp; B Blue strobes &amp; Alarms on: 5Y-ODB1 <input type="checkbox"/>, 5Y-ODB2 <input type="checkbox"/>, 5Y-ODB3 <input type="checkbox"/>, 5Y-ODB4 <input type="checkbox"/>, 5Y-ODB5 <input type="checkbox"/> and 5Y-ODB6 <input type="checkbox"/> are</b>	<b>OFF</b>
<input type="checkbox"/> <b>VERIFY</b>	<b>All red Strobes are</b>	<b>OFF</b>
<input type="checkbox"/> <b>VERIFY</b>	<b>All rotating red Beacons are</b>	<b>OFF</b>
<b>AFTER</b>	<b>&gt; 90 Secs</b>	
<input type="checkbox"/> <b>VERIFY</b>	<b>MCR sees Refrigerator Fans are</b>	<b>OFF</b>
<input type="checkbox"/> <b>VERIFY</b>	<b>Fan REF1 is</b>	<b>OFF</b>
<input type="checkbox"/> <b>VERIFY</b>	<b>Fan REF2 is</b>	<b>OFF</b>
<input type="checkbox"/> <b>VERIFY</b>	<b>Vent RAV1 is</b>	<b>CLOSED</b>
<input type="checkbox"/> <b>VERIFY</b>	<b>Vent RAV2 is</b>	<b>CLOSED</b>
<b>RESET</b>	<b>Refrigerator ODH in MCR</b>	
<input type="checkbox"/> <b>VERIFY</b>	<b>MCR sees Refrigerator ODH alarm on Cryo page is</b>	<b>OK</b>
<input type="checkbox"/>	<b>Check for Acceptance of Test of ODH sensor AS5Y-4 in 5Y-ODB4 with gas</b>	

**1.11 Test of ODH sensor AS5Y-5 in 5Y-ODB5 with gas**

	<b>FLOW</b>	<b>Helium or Nitrogen across sensor AS5Y-5</b>	
<input type="checkbox"/>	<b>VERIFY</b>	<b>MCR sees AS5Y-5 Div A and B</b>	<b>ODH</b>
	<b>RECORD</b>	<b>Oxygen trip level for Div A</b>	_____ %
	<b>RECORD</b>	<b>Oxygen trip level for Div B</b>	_____ %
<input type="checkbox"/>	<b>VERIFY</b>	<b>MCR sees Refrigerator ODH alarm on Cryo page is</b>	<b>ON</b>
<input type="checkbox"/>	<b>VERIFY</b>	<b>Div A &amp; B Blue strobes &amp; Alarms on: 5Y-ODB1 <input type="checkbox"/>, 5Y-ODB2 <input type="checkbox"/>, 5Y-ODB3 <input type="checkbox"/>, 5Y-ODB4 <input type="checkbox"/>, 5Y-ODB5 <input type="checkbox"/> and 5Y-ODB6 <input type="checkbox"/> are</b>	<b>ON</b>
<input type="checkbox"/>	<b>VERIFY</b>	<b>All red Strobes are</b>	<b>FLASHING</b>
<input type="checkbox"/>	<b>VERIFY</b>	<b>All rotating red Beacons are</b>	<b>ON</b>
<input type="checkbox"/>	<b>VERIFY</b>	<b>MCR sees Refrigerator Fans are</b>	<b>ON</b>
<input type="checkbox"/>	<b>VERIFY</b>	<b>Fan REF1 is</b>	<b>ON</b>
<input type="checkbox"/>	<b>VERIFY</b>	<b>Fan REF2 is</b>	<b>ON</b>
<input type="checkbox"/>	<b>VERIFY</b>	<b>Vent RAV1 is</b>	<b>OPENED</b>
<input type="checkbox"/>	<b>VERIFY</b>	<b>Vent RAV2 is</b>	<b>OPENED</b>
	<b>HALT</b>	<b>Flow of gas on AS5Y-5</b>	
	<b>WAIT</b>	<b>For AS5Y-5 to clear (level ~ trip-level above)</b>	
<input type="checkbox"/>	<b>VERIFY</b>	<b>MCR sees AS5Y-5 Div A <input type="checkbox"/> and Div B <input type="checkbox"/></b>	<b>OK</b>
<input type="checkbox"/>	<b>VERIFY</b>	<b>Div A &amp; B Blue strobes &amp; Alarms on: 5Y-ODB1 <input type="checkbox"/>, 5Y-ODB2 <input type="checkbox"/>, 5Y-ODB3 <input type="checkbox"/>, 5Y-ODB4 <input type="checkbox"/>, 5Y-ODB5 <input type="checkbox"/> and 5Y-ODB6 <input type="checkbox"/> are</b>	<b>OFF</b>
<input type="checkbox"/>	<b>VERIFY</b>	<b>All red Strobes are</b>	<b>OFF</b>
<input type="checkbox"/>	<b>VERIFY</b>	<b>All rotating red Beacons are</b>	<b>OFF</b>
	<b>AFTER</b>	<b>&gt; 90 Secs</b>	
<input type="checkbox"/>	<b>VERIFY</b>	<b>MCR sees Refrigerator Fans are</b>	<b>OFF</b>
<input type="checkbox"/>	<b>VERIFY</b>	<b>Fan REF1 is</b>	<b>OFF</b>
<input type="checkbox"/>	<b>VERIFY</b>	<b>Fan REF2 is</b>	<b>OFF</b>
<input type="checkbox"/>	<b>VERIFY</b>	<b>Vent RAV1 is</b>	<b>CLOSED</b>
<input type="checkbox"/>	<b>VERIFY</b>	<b>Vent RAV2 is</b>	<b>CLOSED</b>
	<b>RESET</b>	<b>Refrigerator ODH in MCR</b>	
<input type="checkbox"/>	<b>VERIFY</b>	<b>MCR sees Refrigerator ODH alarm on Cryo page is</b>	<b>OK</b>
<input type="checkbox"/>		<b>Check for Acceptance of Test of ODH sensor AS5Y-5 in 5Y-ODB5 with gas</b>	

**1.12 Test of ODH Sampling System sensor AS5Y-6 in 5Y-ODB6 with gas**

<b>FLOW</b>	<b>Helium or Nitrogen ~ 1" from far input port of Sampling System</b>	
<input type="checkbox"/> <b>VERIFY</b>	<b>MCR sees AS5Y-1 □, -2 □, -3 □, -4 □, - 5 □ Div A and B</b>	<b>ODH</b>
<b>RECORD</b>	<b>Time for Trip</b>	_____ secs
<b>RECORD</b>	<b>Oxygen trip level for Div A</b>	_____ %
<b>RECORD</b>	<b>Oxygen trip level for Div B</b>	_____ %
<input type="checkbox"/> <b>VERIFY</b>	<b>MCR sees Refrigerator ODH alarm on Cryo page is</b>	<b>ON</b>
<input type="checkbox"/> <b>VERIFY</b>	<b>Div A &amp; B Blue strobes &amp; Alarms on: 5Y-ODB1 □, 5Y-ODB2 □, 5Y-ODB3 □, 5Y-ODB4 □, 5Y-ODB5 □ and 5Y-ODB6 □ are</b>	<b>ON</b>
<input type="checkbox"/> <b>VERIFY</b>	<b>All red Strobes are</b>	<b>FLASHING</b>
<input type="checkbox"/> <b>VERIFY</b>	<b>All rotating red Beacons are</b>	<b>ON</b>
<input type="checkbox"/> <b>VERIFY</b>	<b>MCR sees Refrigerator Fans are</b>	<b>ON</b>
<input type="checkbox"/> <b>VERIFY</b>	<b>Fan REF1 is</b>	<b>ON</b>
<input type="checkbox"/> <b>VERIFY</b>	<b>Fan REF2 is</b>	<b>ON</b>
<input type="checkbox"/> <b>VERIFY</b>	<b>Vent RAV1 is</b>	<b>OPENED</b>
<input type="checkbox"/> <b>VERIFY</b>	<b>Vent RAV2 is</b>	<b>OPENED</b>
<b>HALT</b>	<b>Flow of gas on AS5Y-6</b>	
<b>WAIT</b>	<b>For AS5Y-6 to clear (level ~ trip-level above)</b>	
<input type="checkbox"/> <b>VERIFY</b>	<b>MCR sees AS5Y-1 □, -2 □, -3 □, -4 □, - 5 □ Div A and B</b>	<b>OK</b>
<input type="checkbox"/> <b>VERIFY</b>	<b>Div A &amp; B Blue strobes &amp; Alarms on: 5Y-ODB1 □, 5Y-ODB2 □, 5Y-ODB3 □, 5Y-ODB4 □, 5Y-ODB5 □ and 5Y-ODB6 □ are</b>	<b>OFF</b>
<input type="checkbox"/> <b>VERIFY</b>	<b>All red Strobes are</b>	<b>OFF</b>
<input type="checkbox"/> <b>VERIFY</b>	<b>All rotating red Beacons are</b>	<b>OFF</b>
<b>AFTER</b>	<b>&gt; 90 Secs</b>	
<input type="checkbox"/> <b>VERIFY</b>	<b>MCR sees Refrigerator Fans are</b>	<b>OFF</b>
<input type="checkbox"/> <b>VERIFY</b>	<b>Fan REF1 is</b>	<b>OFF</b>
<input type="checkbox"/> <b>VERIFY</b>	<b>Fan REF2 is</b>	<b>OFF</b>
<input type="checkbox"/> <b>VERIFY</b>	<b>Vent RAV1 is</b>	<b>CLOSED</b>
<input type="checkbox"/> <b>VERIFY</b>	<b>Vent RAV2 is</b>	<b>CLOSED</b>
<b>RESET</b>	<b>Refrigerator ODH in MCR</b>	
<input type="checkbox"/> <b>VERIFY</b>	<b>MCR sees Refrigerator ODH alarm on Cryo page is</b>	<b>OK</b>
<input type="checkbox"/>	<b>Check for Acceptance of Test of ODH sensor AS5Y-6 in 5Y-ODB6 with gas</b>	

**1.13 Test of Sampling System Pump**

**CLOSE Flow valve to Sensor**

- |                          |               |   |                 |
|--------------------------|---------------|---|-----------------|
| <input type="checkbox"/> | <b>VERIFY</b> | After ~ _____ Secs SSPV shows   | <b>TROUBLE</b>  |
| <input type="checkbox"/> | <b>VERIFY</b> | MCR sees AS5Y-1 <input type="checkbox"/> , -2 <input type="checkbox"/> , -3 <input type="checkbox"/> , -4 <input type="checkbox"/> , - 5 <input type="checkbox"/> Div A and B   | <b>ODH</b>      |
| <input type="checkbox"/> | <b>VERIFY</b> | MCR sees Refrigerator ODH alarm on Cryo page is   | <b>ON</b>       |
| <input type="checkbox"/> | <b>VERIFY</b> | Div A & B Blue strobes & Alarms on: 5Y-ODB1 <input type="checkbox"/> , 5Y-ODB2 <input type="checkbox"/> , 5Y-ODB3 <input type="checkbox"/> , 5Y-ODB4 <input type="checkbox"/> , 5Y-ODB5 <input type="checkbox"/> and 5Y-ODB6 <input type="checkbox"/> are | <b>ON</b>       |
| <input type="checkbox"/> | <b>VERIFY</b> | All red Strobes are   | <b>FLASHING</b> |
| <input type="checkbox"/> | <b>VERIFY</b> | All rotating red Beacons are  | <b>ON</b>       |
| <input type="checkbox"/> | <b>VERIFY</b> | MCR sees Refrigerator Fans are  | <b>ON</b>       |
| <input type="checkbox"/> | <b>VERIFY</b> | Fan REF1 is   | <b>ON</b>       |
| <input type="checkbox"/> | <b>VERIFY</b> | Fan REF2 is   | <b>ON</b>       |
| <input type="checkbox"/> | <b>VERIFY</b> | Vent RAV1 is  | <b>OPENED</b>   |
| <input type="checkbox"/> | <b>VERIFY</b> | Vent RAV2 is  | <b>OPENED</b>   |

**OPEN Flow valve to Sensor**

- |                          |               |   |               |
|--------------------------|---------------|---|---------------|
| <input type="checkbox"/> | <b>VERIFY</b> | MCR sees AS5Y-1 <input type="checkbox"/> , -2 <input type="checkbox"/> , -3 <input type="checkbox"/> , -4 <input type="checkbox"/> , - 5 <input type="checkbox"/> Div A and B   | <b>OFF</b>    |
| <input type="checkbox"/> | <b>VERIFY</b> | MCR sees Refrigerator ODH alarm on Cryo page is   | <b>OFF</b>    |
| <input type="checkbox"/> | <b>VERIFY</b> | Div A & B Blue strobes & Alarms on: 5Y-ODB1 <input type="checkbox"/> , 5Y-ODB2 <input type="checkbox"/> , 5Y-ODB3 <input type="checkbox"/> , 5Y-ODB4 <input type="checkbox"/> , 5Y-ODB5 <input type="checkbox"/> and 5Y-ODB6 <input type="checkbox"/> are | <b>OFF</b>    |
| <input type="checkbox"/> | <b>VERIFY</b> | All red Strobes are   | <b>OFF</b>    |
| <input type="checkbox"/> | <b>VERIFY</b> | All rotating red Beacons are  | <b>OFF</b>    |
| <input type="checkbox"/> | <b>VERIFY</b> | MCR sees Refrigerator Fans are  | <b>OFF</b>    |
| <input type="checkbox"/> | <b>VERIFY</b> | Fan REF1 is   | <b>OFF</b>    |
| <input type="checkbox"/> | <b>VERIFY</b> | Fan REF2 is   | <b>OFF</b>    |
| <input type="checkbox"/> | <b>VERIFY</b> | Vent RAV1 is  | <b>CLOSED</b> |
| <input type="checkbox"/> | <b>VERIFY</b> | Vent RAV2 is  | <b>CLOSED</b> |
| <input type="checkbox"/> | <b>VERIFY</b> | MCR sees Refrigerator ODH alarm on Cryo Page is   | <b>OK</b>     |

- Check for acceptance of Test of Sampling System Pump

**END OF TEST PROCEDURE**

**TTL: Sign for completion of initial testing:** \_\_\_\_\_

**Date:** \_\_\_\_/\_\_\_\_/\_\_\_\_

**TTL: Sign for completion of final testing:** \_\_\_\_\_

**Date:** \_\_\_\_/\_\_\_\_/\_\_\_\_