Attachment 2

Procedures

- PM534006, Revision 6, Effluent Monitoring Fixed Air Sampler (FAS) Vacuum Pumping System
- PM364005, Revision 14T4, Station A Sample Probe Replacement
- IC041072, Revision 11T3, Flow Instrumentation Calibration for Effluent Monitoring Skids A-2, A-3, B-1 and B-2

PM534006

Revision 6

EFFLUENT MONITORING FIXED AIR SAMPLER (FAS) VACUUM PUMPING SYSTEM

Maintenance Procedure

CONTINUOUS USE

[EM01]

WORKING COPY

EPA Compliance

CONTENTS

CHANGE HISTORY SUMMARY

Revision Number	Date Issued	Description of Changes
6	07/23/20	Rewrite Section 5.3 to allow for properly securing skid backup power. Add Caution block prior to Step 5.3.1 and 5.6.2. Add Step 5.6.2 and 5.6.3. Modify verbiage on Step 5.6.4.

1.0 PURPOSE/SCOPE

The Purpose of this Work Control Document (WCD) is to provide instructions for performing Vacuum Pump testing.

The Scope of this WCD includes vacuum pump testing, pump/motor replacement (if required), control panel inspection and backup power testing for the following equipment:

364-S-101 (Station A Skid A-2) Vacuum Pump 41-G-101A Vacuum Pump 41-G-101B Vacuum Relief Valve 364-PSV-022-021 Vacuum Relief Valve 364-PSV-022-022	**365-S-100 (Station B Skid B-1)** Vacuum Pump 41-G-100A Vacuum Pump 41-G-100B Vacuum Relief Valve 365-PSV-015-008 Vacuum Relief Valve 365-PSV-015-009
364-S-104 (Station A Skid A-3) Vacuum Pump 41-G-104A Vacuum Pump 41-G-104B Vacuum Relief Valve 364-PSV-022-034 Vacuum Relief Valve 364-PSV-022-035	**365-S-102 (Station B Skid B-2)** Vacuum Pump 41-G-102A Vacuum Pump 41-G-102B Vacuum Relief Valve 365-PSV-018-021 Vacuum Relief Valve 365-PSV-018-022
	411-S-105 (Station C) Vacuum Pump 41-G-105A Vacuum Pump 41-G-105B Vacuum Relief Valve 411-PSV-008-006 Vacuum Relief Valve 411-PSV-008-007

Performance of this document implements the action necessary for compliance with EPA's NESHAP regulations.

2.0 SPECIAL TOOLS/EQUIPMENT/MATERIALS

MATERIAL LIST

Item	Material Description	Qty	Unit	Warehouse Stock No.
1	Pressure relief valve	AR	Ea.	534-S-00005
2	Filter cartridge	2	Ea.	RMS-03-03001
3	Motor, electrical	1	Ea.	RMS-03-02011
4	Pump, vacuum	1	Ea.	RMS-03-02022

PERSONAL PROTECTIVE EQUIPMENT (PPE)

Description
Arc Flash PPE as determined from WP 12-IS.03, Table 8-1.
Safety glasses with side shields.

SPECIAL TOOLS/EQUIPMENT

Description
Pressure Source

MEASUREMENT & TESTING EQUIPMENT (M&TE)

Instrument Description	Instrument Number	Cal Due Date	Cal Data Verified Current M&TE Initials
DLRO Meter, Calibrated			
Process Calibrator, Calibrated			
Pressure Module, Calibrated			
Pressure Calibrator, Calibrated			

3.0 PRECAUTIONS/LIMITATIONS

3.1 PRECAUTIONS

RADIOLOGICAL HAZARD exists. Craft may be exposed to a Radiological Hazard when performing work in a Radiological area.

ELECTRICAL HAZARD exists. Craft may be exposed to an Electrical Hazard when replacing the pump/motor.

PINCH POINTS HAZARD exists. Craft may be exposed to a Pinch Points Hazard when performing this procedure.

SLIPS/TRIPS HAZARD exists. Craft may be exposed to a Slips/Trips Hazard when working around uneven surfaces.

3.2 LIMITATIONS

NONE.

4.0 PREREQUISITES

4.1 PREREQUISITES

[ ] 4.1.1 Field Work Supervisor (FWS) **CONDUCT** pre-job brief in accordance with WP 04-AD3030, *Pre-Job Briefings and Post-Job Reviews,* **AND DISCUSS** the Personal Protective Equipment (PPE) required and possible Thermal Stress issues to perform the job.

_____
FWS/DATE

[ ] 4.1.2 **OBTAIN** items shown in Section 2.0, Special Tools/Equipment/Materials.

[ ] 4.1.3 **NOTIFY** CMR vacuum pump maintenance is to be performed.

_____
CRAFT/DATE

4.2 RADIOLOGICAL WORK PERMIT (RWP) REQUIREMENTS

[ ] 4.2.1 Rad Con Operations (RCO), **PERFORM** a RWP evaluation, **AND RECORD** RWP number below.

RWP #_____ ☐ N/A

_____/_____
RCO/DATE

[ ] 4.2.2 **IF** RWP is required,
THEN all personnel **READ AND DISCUSS** the RWP, radiological hazards, precautions and mitigating actions to be taken as documented in the RWP, **AND SIGN** the RWP. ☐ N/A

_____/_____
RCT/DATE

HOLD POINT

[ ] 4.2.3 RCT, **PERFORM** applicable sections of 12-HP1305/12-HP1325 **AND VERIFY** vacuum pump skids are released for maintenance.

_____
RCT/DATE

NOTE

Deficiencies, if any, will be documented on the Work Status Log (WSL) and FWS notified.

5.0 PERFORMANCE

5.1 FILTER REPLACEMENT

[ ] 5.1.1 **IF** filter replacement is needed,
THEN REMOVE AND REPLACE vacuum pump canister filters.

☐ REPLACED ☐ NOT REPLACED

_____
CRAFT/DATE

5.2 VACUUM PUMP TESTS

[ ] 5.2.1 **ENSURE** Vacuum Pump #1 is OFF.

[ ] 5.2.2 **DISCONNECT** sample tubing at a location upstream of pressure relief valve.

[ ] 5.2.3 **CONNECT** pressure module **AND SET** for InHg.

[ ] 5.2.4 **START** vacuum pump.

[ ] 5.2.5 **RECORD** AS FOUND vacuum indication on Data Block.

[ ] 5.2.6 **IF** AS FOUND indication is within tolerance per Data Block,
THEN RECORD AS LEFT on Data Block **AND GO TO** Step [ ] 5.2.8.

[ ] 5.2.7 **IF** AS FOUND indication is NOT within tolerance per Data Block,
THEN ADJUST valve for indication within tolerance.

[ ] 5.2.8 **DISCONNECT** M&TE.

[ ] 5.2.9 **RECONNECT** Pump #1 tubing.

_____
CRAFT/DATE

[ ] 5.2.10 **ENSURE** Vacuum Pump #2 is OFF.

[ ] 5.2.11 **DISCONNECT** sample tubing at a location upstream of pressure relief valve.

[ ] 5.2.12 **CONNECT** pressure module **AND SET** for InHg.

[ ] 5.2.13 **START** vacuum pump.

[ ] 5.2.14 **RECORD** AS FOUND vacuum indication on Data Block.

[ ] 5.2.15 **IF** AS FOUND indication is within tolerance per Data Block,
THEN RECORD AS LEFT value on Data Block
AND GO TO Step [ ] 5.2.18.

[ ] 5.2.16 **IF** AS FOUND indication is NOT within tolerance per Data Block,
THEN ADJUST valve for indication within tolerance.

[ ] 5.2.17 **IF** either pressure relief valve has failed,
THEN REPLACE with spare **AND REPEAT** Steps [ ] 5.2.1 – [ ] 5.2.9 AND/OR Steps [ ] 5.2.10 – [ ] 5.2.16 (depending on which relief valve was replaced).

[ ] 5.2.18 **DISCONNECT** M&TE.

[ ] 5.2.19 **RECONNECT** Pump #2 tubing.

[ ] 5.2.20 **IF** vacuum pump/motor have NOT failed,
THEN GO TO Section 5.5.

5.3 VACUUM PUMP/MOTOR REPLACEMENT PREPARATION

NOTE

Station A/B/C pump/motor backup power is provided by a Heart or Magnum inverter. The following steps provide instructions for disabling backup power.

CAUTION

Power must be secured as written to avoid damage to the inverter.

[ ] 5.3.1 **SECURE** power to skid at control panel.

[ ] 5.3.2 **IF** skid is equipped with Heart Inverter,
THEN PERFORM the following: ☐N/A

[ ] 5.3.2.1 **PLACE** power switch on front panel of Heart Inverter to the OFF position.

[ ] 5.3.2.2 **PLACE** power switch for Heart Inverter remote interface panel to the OFF position.

[ ] 5.3.3 **PERFORM** LO/TO in accordance with WP 04-AD3011, *Equipment Lockout/Tagout* as follows:

[ ] 5.3.3.1 **SECURE** MAIN power to skid.

[ ] 5.3.3.2 **LIFT** POSITIVE lead on battery bank.

5.4 PUMP/MOTOR REPLACEMENT

[ ] 5.4.1 **IF** replacing pump ONLY,
THEN GO TO Step [ ] 5.4.3.

[ ] 5.4.2 **DISCONNECT** flex conduit from motor junction box.

[ ] 5.4.3 **DISCONNECT** tubing from pump as necessary.

[ ] 5.4.4 **REMOVE** pump/motor from skid.

[ ] 5.4.5 **ATTACH** replacement motor to pump, as necessary.

[ ] 5.4.6 **INSTALL** replacement pump/motor on skid.

[ ] 5.4.7 **IF** replacing pump ONLY,
THEN GO TO Step [ ] 5.4.10.

[ ] 5.4.8 **ATTACH** flex conduit and route wiring to motor connections.

[ ] 5.4.9 **CONNECT** motor power leads per instructions located on motor cap.

_____
CRAFT/DATE

[ ] 5.4.10 **CONNECT** sample tubing to pump as required.

_____
CRAFT/DATE

[ ] 5.4.11 **IF** motor was replaced, ☐N/A
THEN PERFORM the following:

[ ] 5.4.11.1 **MEASURE AND RECORD** resistance between motor frame and ground bus or system ground grid using a minimum 10-amp rated Digital Low Resistance Ohmmeter (DLRO).

_____
CRAFT/DATE

[ ] 5.4.11.2 **VERIFY** resistance measurement is 0.01 ohms or less, excluding test leads.

_____
CRAFT/DATE

5.5 PUMP CONTROL PANEL INSPECTION

[ ] 5.5.1 **INSPECT** pump control panel and enclosure for the following:

- Cleanliness ☐ SAT ☐ UNSAT
- Terminal tightness ☐ SAT ☐ UNSAT
- Visible wire damage ☐ SAT ☐ UNSAT
- Corrosion ☐ SAT ☐ UNSAT

_____
CRAFT/DATE

[ ] 5.5.2 **CORRECT** deficiencies identified on Step [ ] 5.5.1.

[ ] 5.5.3 **DOCUMENT** deficiencies AND actions taken on WSL.

5.6 EQUIPMENT AND POWER LINEUP

[ ] 5.6.1 **REMOVE** M&TE, if not already removed.

CAUTION

Power must be restored as written to avoid damage to the inverter.
Positive battery lead will produce a spark when reconnected to battery bank.

[ ] 5.6.2 **REMOVE** LO/TO in accordance with WP 04-AD3011, *Equipment Lockout/Tagout* as follows:

[ ] 5.6.2.1 **LAND** POSITIVE lead on battery bank.

[ ] 5.6.2.2 **RESTORE** MAIN power to skid.

[ ] 5.6.3 **RESTORE** power to skid at control panel.

[ ] 5.6.4 **ENSURE** backup power has been restored.

_____
CRAFT/DATE

[ ] 5.6.5 **IF** pump/motor were replaced,
THEN PERFORM the following:

[ ] 5.6.5.1 **ENSURE** vacuum pump is OFF.

[ ] 5.6.5.2 **DISCONNECT** sample tubing at a location upstream of pressure relief valve.

[ ] 5.6.5.3 **CONNECT** pressure module **AND SET** for InHg.

[ ] 5.6.5.4 **START** vacuum pump.

[ ] 5.6.5.5 **RECORD** AS LEFT vacuum indication on Data Block.

[ ] 5.6.5.6 **IF** AS LEFT indications are NOT within tolerance per Data Block,
THEN ADJUST valve to within tolerance.

5.7 BACKUP POWER TESTING

[ ] 5.7.1 **START** FAS on AC power.

[ ] 5.7.2 **SECURE** AC power to FAS under test per Table 1.

Table 1

FAS Unit	Isolating Device	Position	Location
364-S-101, Station A Skid A-2	CB-2	OPEN	41P-DP03/33
364-S-104, Station A Skid A-3	41P-SW03/31	OPEN	Inside Hut
365-S-100, Station B Skid B-1	CB-7	OPEN	41P-MPC03/2
365-S-102, Station B Skid B-2	CB-5	OPEN	41P-MPC03/2
411-S-105, Station C	CB-7	OPEN	41P-DP03/3

[ ] 5.7.3 **RECORD** test start DATE/TIME.

DATE: ☐

TIME: ☐

_____
CRAFT/DATE

[ ] 5.7.4 **ALLOW** FAS to operate on backup power for 30 minutes.

[ ] 5.7.5 **RECORD** test finish DATE/TIME.

DATE: ☐

TIME: ☐

_____
CRAFT/DATE

[ ] 5.7.6 **RECORD** results of 30 minute backup power test.

☐ SAT ☐ UNSAT

_____
CRAFT/DATE

[ ] 5.7.7 **IF** backup power source fails 30 minute test,
THEN NOTIFY FWS **AND PROCEED** as directed.

[ ] 5.7.8 **RESTORE** AC power.

_____
CRAFT/DATE

[ ] 5.7.9 **NOTIFY** CMR task is complete.

_____
CRAFT/DATE

6.0 TESTING AND RESTORATION

NOTE

It is the intent of this procedure to allow FAS to be returned to service with NOTED deficiencies.

6.1 POST JOB TESTING

[ ] 6.1.1 RCT, **PERFORM** applicable sections of 12-HP1305/12-HP1325.

☐ SAT ☐ UNSAT

_____
RCT/DATE

6.2 RESTORATION

[ ] 6.2.1 **VERIFY** FAS has been returned to service.

_____
RCT/DATE

6.3 POST-JOB REVIEW

[ ] 6.3.1 FWS **CONDUCT** post-job review in accordance with WP 04-AD3030, *Pre-Job Briefings and Post-Job Reviews*.

☐ Formal ☐ Informal

_____
FWS/DATE

[ ] 6.3.2 WORK CONTROL CENTER (WCC), **SUBMIT** scanned (.pdf) file of CHAMPs coversheet to EPA folder in HWFP Inspection Library.

_____
WCC/DATE

All personnel affixing initials to these work instructions **PROVIDE** the information listed in the PERSONNEL DATA table below:

PERSONNEL DATA

Printed Name	Signature	Initials	Date

ATTACHMENT 1

Data Block

Pump #: _____ **Relief Valve:** _____

Desired (In Hg)	Minimum (In Hg)	As Found (In Hg)	As Left (In Hg)	Maximum (In Hg)
20	19			21

Pump #: _____ **Relief Valve:** _____

Desired (In Hg)	Minimum (In Hg)	As Found (In Hg)	As Left (In Hg)	Maximum (In Hg)
20	19			21

PM364005

Revision 14T4

Station A Sample Probe Replacement

Maintenance Procedure

CONTINUOUS USE

[EM01]

WORKING COPY

EPA COMPLIANCE

CONTENTS

CHANGE HISTORY SUMMARY

Revision Number	Date Issued	Description of Changes
14	5/1/18	Complete re-write. USQ #S18-0325.
14T1	9/7/18	Change title to “Station A sample Probe Replacement”. Step 6.1.4, Delete "REMOVE double bag". Delete Step 6.1.5. Step 6.1.6, Delete "determined".
14T1IA	10/09/18	Update format to current Template. Delete "(at 160 ft. elevation) for...pull". Correct numbering @ Step 5.2.5.
14T1IB	02/12/19	Added Critical Lift Plan WIPPLP364-S-101 Rev. 0 to PDF.
14T2	04/24/19	Remove Critical Lift Plan. NWP Crane & Operator not qualified - Vendor Crane & Qualified Operator will be used.
14T3	01/14/20	Added Steps 5.4.11 and 5.9.11 for CSE to visually inspect probe.
14T3IA	05/21/20	Added EPA Compliance required statements on coversheet, sections 1.0 and section 6.2. Step 5.4.11 add photograph probe.
14T4	9/17/20	Added Steps [ ] 5.4.5.1 and [ ] 5.9.5.1 to visually inspect probe/transport assembly during lifting.

1.0 PURPOSE/SCOPE

The Purpose of this Work Control Document (WCD) is to provide instructions for personnel to replace Probes at Building 364, Station “A” 364-S-101 (A2) and 364-S-104 (A3). The WCD also outlines Radiological Control Technician (RCT) instructions for safe survey and replacement.

The Scope of this WCD includes the removal and replacement of Skid A2, Probe 364-S-101 and Skid A3, Probe 364-S-104 and post job testing/restoration of the equipment.

Performance of this document implements action necessary for compliance with EPA’s NESHAP regulations.

2.0 SPECIAL TOOLS/EQUIPMENT/MATERIALS

MATERIAL LIST

Item	Material Description	Qty	Unit	Warehouse Stock No.
1	Anti-seize	AR	EA	X-41-01792
2	½” Rope	AR	EA	41-00029
3	3/8” Rope	AR	EA	41-01773
4	Silicone O-Ring Grease	AR	EA	41-K-01201
5	O-ring, AS-568-B-227-70	AR	EA	Shop Stock
6	Flange Gasket	AR	EA	Shop Stock
7	Cover	1	EA	Shop Stock
8	Ultra-Rad Bags (24” rad sleeving)	AR	EA	Rad Con
9	Probe, Shrouded	AR	EA	364-S-10110
10	Bag Padding	AR	AR	N/A
11	Bag Straps	AR	AR	Shop Stock
12	DOT Approved Bucket/Barrel with Lid	1	EA	Rad Con

SPECIAL TOOLS/EQUIPMENT

Description
Long Sleeve Clothing
Face Shield
Respirator (as applicable per RWP)
Strap Wrench(es)
Pipe Wrench(es)
Flange Adaptor
Crane
Communication Radio(s)
Rigging
Single Set of PPE per RWP
PAPR (as applicable per RWP)

2.1 SPECIAL TRAINING/QUALIFICATIONS/MEDICAL REQUIREMENTS

- Qualified Mobile Crane Operator
- Qualified Incidental Rigger
- Qualified Radiological Control Technician (RCT)

3.0 PRECAUTIONS/LIMITATIONS

3.1 PRECAUTIONS

CHEMICAL HAZARD exists. Craft may be exposed to chemical hazards due to the use of grease and anti-seize.

FALLS RELATING TO ROOF WORK HAZARD exists. Craft may be exposed to Falls Relating to Roof Work Hazard while working on Station A.

HEAT STRESS DUE TO TASK SPECIFIC PPE HAZARD exists. Craft wearing single or double sets, for radiation protection, may be exposed to heat stress hazard.

HOISTING, RIGGING, AND CRANE HAZARD exists. Craft may be exposed to Suspended Load Hazard due to crane use.

PINCH POINT HAZARD exists. Craft may be exposed to Pinch Point Hazard due to removal and reinstallation of Transport lines and Probes.

RADIOLOGICAL HAZARD exists. Craft may be exposed to Radiological Hazards if equipment is in a Radiological Affected Area.

4.0 PREREQUISITES

4.1 PREREQUISITES

[ ] 4.1.1 Field Work Supervisor (FWS) **CONDUCT** pre-job brief in accordance with WP 04-AD3030, *Pre-Job Briefings and Post-Job Reviews,*
AND DISCUSS the Personal Protective Equipment (PPE) required and possible Thermal Stress issues to perform the job.

_____
FWS/DATE

[ ] 4.1.2 **NOTIFY** Site Environmental Compliance (SEC) this procedure is being performed on Station A.

_____
FWS/DATE

[ ] 4.1.3 **READ AND COMPLY** with Critical Lift Plan.

_____
FWS/DATE

NOTE

Steps [ ] 4.2.1 – [ ] 4.2.5 may be performed out of order.

4.2 PREPARATION

[ ] 4.2.1 **ENSURE** sustained wind speed is less than or equal to (≤) 20 mph.

[ ] 4.2.2 **OBTAIN** items shown in Section 2.0, Special Tools/Equipment/Materials.

[ ] 4.2.3 Mobile Crane Operator **POSITION** crane for Probe/Transport line lift.

[ ] 4.2.4 **UTILIZE** designated fire watch while staging crane and during work evolution.

- Designated fire watch must have a portable fire extinguisher in the combustible loading area.
- Designated fire watch must remain with the crane at all times while inside the combustible loading area.

[ ] 4.2.5 **PREPARE** clean probe for installation, **AND PERFORM** the following substeps in order.

[ ] 4.2.5.1 **WEAR** safety glasses with side shields while handling grease or anti-seize.

[ ] 4.2.5.2 **WEAR** leather/mechanic gloves while performing work.

[ ] 4.2.5.3 **ENSURE** greased O-ring is installed.

[ ] 4.2.5.4 **ENSURE** anti-seize is on the threads.

NOTE

1. Deficiencies, if any, will be documented on the Work Status Log (WSL) and FWS notified.
2. Order of performance: Skid A-2 first, then Skid A-3 unless ONLY working on Skid A-3.

5.0 PERFORMANCE

5.1 WORK AREA CONFIGURATION AND HAZARD MITIGATION

[ ] 5.1.1 **TAKE BREAKS** between tasks **AND MONITOR/ASSESS** as needed to avoid possible heat stress.

[ ] 5.1.2 **WEAR** hard hat, hard toe shoes/boots, and safety glasses with side shields while performing work with crane.

5.2 RADIOLOGICAL WORK PERMIT (RWP) REQUIREMENTS

[ ] 5.2.1 Rad Con Operations (RCO), **PERFORM** a RWP evaluation **AND RECORD** RWP number on Attachment 1. **MARK** N/A if not required.

☐ N/A

_____
RCO/DATE

[ ] 5.2.2 **IF** RWP is required,
THEN Rad Con Tech (RCT) and all personnel **READ AND DISCUSS** the RWP, radiological hazards, precautions and mitigating actions to be taken as documented in the RWP, **AND SIGN** the RWP. **MARK** N/A if not required. ☐ N/A

_____
RCT/DATE

5.3 CRANE PREPARATION SKID A2

[ ] 5.3.1 **UTILIZE** barriers in accordance with WP 12-IS.01-1, *Industrial Safety Program – Barricades and Barriers*.

_____
CRAFT/DATE

[ ] 5.3.2 **ENSURE** communication is established with Crane Operator.

[ ] 5.3.3 **PREPARE** Crane for Probe/Transport line removal per the following:

[ ] 5.3.3.1 **ATTACH** probe lift rigging to crane.

[ ] 5.3.3.2 **POSITION** Crane boom over Skid being worked on.

[ ] 5.3.4 RCT, **ENSURE** skid being worked on is secure.

_____
RCT/DATE

[ ] 5.3.5 **IF** only replacing Skid A3 Probe 364-S-104,
THEN SKIP Sections 5.4 - 5.8,
AND GO TO Section 5.9.

5.4 SKID A2 PROBE 364-S-101 REMOVAL

[ ] 5.4.1 **KEEP** hands and limbs clear of pinch points.

[ ] 5.4.2 **PREPARE** Skid “A2” Probe Pull by performing the following:

[ ] 5.4.2.1 **REMOVE** roof flange over Skid A2.

[ ] 5.4.2.2 **DISCONNECT** instrument fittings as needed for probe removal.

[ ] 5.4.2.3 **REMOVE** splitter flange bolts and splitter.

[ ] 5.4.2.4 RCT, **PERFORM** radiological survey to assess job coverage.

[ ] 5.4.2.5 **ATTACH** flange adapter to probe flange.

[ ] 5.4.3 **REMOVE** fasteners securing probe flange to guard pipe.

[ ] 5.4.4 **ATTACH** rigging to adapter flange.

[ ] 5.4.5 **LIFT** transport/probe assembly.

[ ] 5.4.5.1 While LIFTING probe/transport assembly, **VISUALLY INSPECT** transport line, couplings and welds for signs of wear or deterioration.

IF any Deficiencies are observed place work in a safe condition and **NOTIFY** the CSE for further evaluation.

☐ SAT ☐ UNSAT

_____
CRAFT/DATE

[ ] 5.4.6 **IF** pull weight begins exceeding 500 lb,
THEN IMMEDIATELY STOP lifting **AND ATTEMPT** manipulating the transport assembly to free itself of any obstructions.

[ ] 5.4.6.1 **IF** manipulation is successful,
THEN GO TO Step [ ] 5.4.7.

[ ] 5.4.6.2 **IF** manipulation result is not successful,
THEN STOP work, **AND NOTIFY** Cognizant System Engineer (CSE). ☐ N/A

_____
CRAFT/DATE

[ ] 5.4.7 RCT, **PERFORM** radiological survey of transport line as it is being lifted.

_____
RCT/DATE

[ ] 5.4.7.1 **IF** radiological survey of transport line exceeds:

Type	Removable	Total (Fixed + Removable)
Alpha	20 dpm/100 cm2	100 dpm/100 cm2
Beta/Gamma	200 dpm/100 cm2	1000/100 cm2

THEN STOP lifting transport line,
AND FOLLOW RCT direction.

[ ] 5.4.8 **PLACE** cover over open guard pipe flange.

[ ] 5.4.9 **FASTEN** chain vise around transport line.

[ ] 5.4.10 **REMOVE** shrouded probe using strap wrench(es).

[ ] 5.4.11 Cognizant System Engineer (CSE), Photograph probe and **PERFORM** visual inspection to determine if probe meets the following requirements:

AS FOUND CONDITION:
Salt buildup at probe inlet is less than 2/3 ☐ Sat ☐ Unsat
Salt buildup blocking shroud exhaust is less than 1/3 ☐ Sat ☐ Unsat

_____
CSE/DATE

[ ] 5.4.12 RCT, **SURVEY** probe, **DOUBLE BAG, LABEL AND PLACE** out of the way.

_____
RCT/DATE

5.5 INSTALL CLEAN PROBE

[ ] 5.5.1 **INSTALL** probe on transport line.

[ ] 5.5.2 **REMOVE** chain vise.

5.6 PROBE/TRANSPORT LINE REINSTALLATION

[ ] 5.6.1 **REMOVE** cover over open guard pipe flange.

[ ] 5.6.2 **INSPECT** mounting flange gasket for damage. ☐ Sat ☐ Damaged

[ ] 5.6.3 **IF** gasket is damaged,
THEN REPLACE. **N/A** this step if undamaged. ☐ N/A

NOTE

Steps [ ] 5.6.4 and [ ] 5.6.5 should be performed in unison.

[ ] 5.6.4 **LOWER** probe/transport assembly until it rests on guard pipe flange.

[ ] 5.6.5 **ENSURE** fastener mounting flange holes are aligned.

[ ] 5.6.6 **REMOVE** rigging.

[ ] 5.6.7 **INSTALL** mounting flange fasteners.

[ ] 5.6.8 **INSTALL** roof flange.

5.7 3-WAY SPLITTER INSTALLATION

[ ] 5.7.1 **REMOVE** flange adapter.

[ ] 5.7.2 **INSPECT** O-ring. ☐ Sat ☐ Damaged

[ ] 5.7.3 **IF** O-ring damaged,
THEN REPLACE, this step may be N/A'd. ☐ N/A

[ ] 5.7.4 **INSTALL** 3-way splitter.

[ ] 5.7.5 **RECONNECT** instrument fittings.

[ ] 5.7.6 **RESTORE** Skid back to service, as required.

[ ] 5.7.7 **IF** only replacing Skid A2, Probe 364-S-101,
THEN GO TO Section 6.0.

5.8 CRANE PREPARATION SKID A3

[ ] 5.8.1 **POSITION** Crane boom over Skid A3.

[ ] 5.8.2 RCT, **ENSURE** skid is secure.

_____
RCT/DATE

5.9 SKID A3 PROBE 364-S-104 REMOVAL

[ ] 5.9.1 **KEEP** hands and limbs clear of pinch points.

[ ] 5.9.2 **PREPARE** Skid "A3" Probe Pull by performing the following:

[ ] 5.9.2.1 **REMOVE** roof flange over Skid A3.

[ ] 5.9.2.2 **DISCONNECT** instrument fittings as needed for probe removal.

[ ] 5.9.2.3 **REMOVE** splitter flange bolts and splitter.

[ ] 5.9.2.4 RCT, **PERFORM** radiological survey to assess job coverage.

[ ] 5.9.2.5 **ATTACH** flange adapter to probe flange.

[ ] 5.9.3 **REMOVE** fasteners securing probe flange to guard pipe.

[ ] 5.9.4 **ATTACH** rigging to adapter flange.

[ ] 5.9.5 **LIFT** transport/probe assembly.

[ ] 5.9.5.1 While LIFTING probe/transport assembly, **VISUALLY INSPECT** transport line, couplings and welds for signs of wear or deterioration.

IF any Deficiencies are observed place work in a safe condition and **NOTIFY** the CSE for further evaluation.

☐ SAT ☐ UNSAT

_____
CRAFT/DATE

[ ] 5.9.6 **IF** pull weight begins exceeding 500 lb,
THEN IMMEDIATELY STOP lifting **AND ATTEMPT** manipulating the transport assembly to free itself of any obstructions.

[ ] 5.9.6.1 **IF** manipulation is successful,
THEN GO TO Step [ ] 5.9.7.

[ ] 5.9.6.2 **IF** manipulation result is not successful,
THEN STOP work, **AND NOTIFY** CSE. ☐ N/A

_____
CRAFT/DATE

[ ] 5.9.7 RCT, **PERFORM** radiological survey of transport line as it is being lifted.

[ ] 5.9.7.1 **IF** radiological survey of transport line exceeds:

Type	Removable	Total (Fixed + Removable)
Alpha	20 dpm/100 cm2	100 dpm/100 cm2
Beta/Gamma	200 dpm/100 cm2	1000/100 cm2

THEN STOP lifting transport line,
AND FOLLOW RCT direction.

[ ] 5.9.8 **PLACE** cover over open guard pipe flange.

[ ] 5.9.9 **FASTEN** the chain vise around transport line.

[ ] 5.9.10 **REMOVE** shrouded probe using strap wrench(es).

[ ] 5.9.11 Cognizant System Engineer (CSE), **PERFORM** visual inspection to determine if probe meets the following requirements:

AS FOUND CONDITION:
Salt buildup at probe inlet is less than 2/3 ☐ Sat ☐ Unsat
Salt buildup blocking shroud exhaust is less than 1/3 ☐ Sat ☐ Unsat

_____
CSE/DATE

[ ] 5.9.12 RCT, **SURVEY** probe, **DOUBLE BAG, LABEL AND PLACE** out of the way.

_____
RCT/DATE

5.10 INSTALL CLEAN PROBE

[ ] 5.10.1 **INSTALL** probe on transport line.

[ ] 5.10.2 **REMOVE** chain vise.

5.11 PROBE/TRANSPORT LINE REINSTALLATION

[ ] 5.11.1 **REMOVE** cover over open guard pipe flange.

[ ] 5.11.2 **INSPECT** mounting flange gasket for damage. ☐ Sat ☐ Damaged

[ ] 5.11.3 **IF** gasket is damaged,
THEN REPLACE. **N/A** this step if undamaged. ☐ N/A

NOTE

Steps [ ] 5.11.4 and [ ] 5.11.5 should be performed in unison.

[ ] 5.11.4 **LOWER** probe/transport assembly until it rests on guard pipe flange.

[ ] 5.11.5 **ENSURE** fastener mounting flange holes are aligned.

[ ] 5.11.6 **REMOVE** rigging.

[ ] 5.11.7 **INSTALL** mounting flange fasteners.

[ ] 5.11.8 **INSTALL** roof flange.

5.12 3-WAY SPLITTER INSTALLATION

[ ] 5.12.1 **REMOVE** flange adapter.

[ ] 5.12.2 **INSPECT** O-ring. ☐ Sat ☐ Damaged

[ ] 5.12.3 **IF** O-ring damaged,
THEN REPLACE, this step may be N/A'd. ☐ N/A

[ ] 5.12.4 **INSTALL** 3-way splitter.

[ ] 5.12.5 **RECONNECT** instrument fittings.

[ ] 5.12.6 **RESTORE** skid back to service, as required.

6.0 TESTING AND RESTORATION

NOTE

Steps in Section 6.1 may be performed out-of-order or concurrently.

6.1 RESTORATION

[ ] 6.1.1 **REMOVE** barriers and properly store or discard.

[ ] 6.1.2 **MOVE** crane to designated area.

[ ] 6.1.3 RCT, **MOVE** rad bag/sleeve and any other waste to designated site-generated radiological waste area.

[ ] 6.1.4 RCT, **MOVE** shrouded probe(s) in double bag to small decon room, **AND PLACE** in rubber tote.

[ ] 6.1.5 RCT, **ENSURE** the area is not contaminated OR posted in accordance with WP 12-HP1500, *Radiological Posting and Access Control*.

_____
RCT/DATE

6.2 POST-JOB REVIEW

[ ] 6.2.1 FWS **CONDUCT** post-job review in accordance with WP 04-AD3030, *Pre-Job Briefings and Post-Job Reviews*.

☐ Formal ☐ Informal

_____
FWS/DATE

[ ] 6.2.2 CSE, **REVIEW** work performed.

_____
CSE/DATE

[ ] 6.2.3 **SUBMIT** scanned (.pdf) file of CHAMPs work order coversheet to “EPA” folder in HWFP inspection Library

_____
WCC/DATE

All personnel affixing initials to these work instructions **PROVIDE** the information listed in the PERSONNEL DATA table below:

PERSONNEL DATA

Printed Name	Signature	Initials	Date

IC041072

Revision 11T3

FLOW INSTRUMENTATION CALIBRATION FOR EFFLUENT MONITORING SKIDS A-2, A-3, B-1 AND B-2

Maintenance Procedure

CONTINUOUS USE

[EM01]

WORKING COPY

EPA Compliance

CONTENTS

CHANGE HISTORY SUMMARY

Revision Number	Date Issued	Description of Changes
11	10/17/18	Added EPA Compliance Information Added step 5.1.1 Updated Notes Revised Step 5.1.21 & 5.1.22 Revised Sequence Section 5.3 and 5.4.
11IA	10/18/18	Remove PM frequency specifications.
11T1	06/17/19	Update to current template. Add Step 5.4.1 and add verbiage to Step 6.2.1 per Wipp Form ACT19-285-4. Add Step 5.5.2 to align hazard mitigations with current JHA. Add Steps 6.2.6 – 6.2.7 per WF19-371 ICE 1075.
11T2	10/22/19	Change verbiage on Step 4.4.1 for RADCON to secure skid per FSM.
11T2IA	10/28/19	Update Hazards/Mitigations to match current JHA.
11T3	11/13/20	Update Hazards/Mitigations to match current JHA. Change PDI A, B & C to PDI 1, 2 & 3 on Data Blocks 2, 3 & 4. Mark CMR readings on Data Blocks 3 & 4 as “Station A Only”. Remove reference to Skid A-1 in Title and Section 1.0.

1.0 PURPOSE/SCOPE

The Purpose of this Work Control Document (WCD) is to provide instructions calibrating the Effluent Monitoring Fixed Air Samplers (FAS) along with Skids A-2, A-3, B-1 and B-2. It is the intent of this procedure to allow parts replacement in support of a successful calibration for the listed equipment.

Performance of this document, implements action necessary for compliance with EPA’s NESHAP regulations.

The Scope of this WCD includes the inspection, preventive maintenance and post job testing/restoration of the following equipment:

Skid 364-S-101, A-2 **LPU 836**

Instrument Name	Instrument Number	CMS Point
I/O Panel	364-IP-022-002	N/A
Flow Control Valve 1	364-FCV-022-0012	N/A
Flow Control Valve 2	364-FCV-022-0022	N/A
Flow Control Valve 3	364-FCV-022-0032	N/A
Flow Indicating Controller 1	364-FIC-022-0012	AP2512
Flow Indicating Controller 2	364-FIC-022-0022	AP2515
Flow Indicating Controller 3	364-FIC-022-0032	AP2416
Pressure Differential Indicator 1	364-PDI-022-0012	A360503 EM010003
Pressure Differential Indicator 2	364-PDI-022-0022	A360505 EM010004
Pressure Differential Indicator 3	364-PDI-022-0032	AP2513
Pressure Differential Transducer 1	364-PDT-022-0012	N/A
Pressure Differential Transducer 2	364-PDT-022-0022	N/A
Pressure Differential Transducer 3	364-PDT-022-0032	N/A

Skid 364-S-104, A-3 **LPU 836**

Instrument Name	Instrument Number	CMS Point
I/O Panel	364-IP-022-003	N/A
Flow Control Valve 1	364-FCV-022-0013	N/A
Flow Control Valve 2	364-FCV-022-0023	N/A
Flow Control Valve 3	364-FCV-022-0033	N/A
Flow Indicating Controller 1	364-FIC-022-0013	AH6733
Flow Indicating Controller 2	364-FIC-022-0023	AH6734
Flow Indicating Controller 3	364-FIC-022-0033	AH6735
Pressure Differential Indicator 1	364-PDI-022-0013	A360507 EM010005
Pressure Differential Indicator 2	364-PDI-022-0023	A360509 EM010006
Pressure Differential Indicator 3	364-PDI-022-0033	AH6725
Pressure Differential Transducer 1	364-PDT-022-0013	N/A
Pressure Differential Transducer 2	364-PDT-022-0023	N/A
Pressure Differential Transducer 3	364-PDT-022-0033	N/A

Skid 365-S-100, B-1 **LPU 835**

Instrument Name	Instrument Number	CMS Point
I/O Panel	365-IP-015-100	N/A
Flow Control Valve 1	365-FCV-015-004A	N/A
Flow Control Valve 2	365-FCV-015-004B	N/A
Flow Control Valve 3	365-FCV-015-004C	N/A
Flow Indicating Controller 1	365-FIC-015-004A	AP2409
Flow Indicating Controller 2	365-FIC-015-004B	AP2408
Flow Indicating Controller 3	365-FIC-015-004C	AP2404
Pressure Differential Indicator 1	365-PDI-015-005A	AH6737
Pressure Differential Indicator 2	365-PDI-015-005B	**TBD**
Pressure Differential Indicator 3	365-PDI-015-005C	**TBD**
Pressure Differential Transducer 1	365-PT-015-004A	**TBD**
Pressure Differential Transducer 2	365-PT-015-004B	**TBD**
Pressure Differential Transducer 3	365-PT-015-004C	**TBD**

Skid 365-S-102, B-2 **LPU 835**

Instrument Name	Instrument Number	CMS Point
I/O Panel	365-IP-018-005	N/A
Flow Control Valve 1	365-FCV-018-009A	N/A
Flow Control Valve 2	365-FCV-018-009B	N/A
Flow Control Valve 3	365-FCV-018-009C	N/A
Flow Indicating Controller 1	365-FIC-018-005A	AH6727
Flow Indicating Controller 2	365-FIC-018-005B	AH6728
Flow Indicating Controller 3	365-FIC-018-005C	AH6736
Pressure Differential Indicator 1	365-PDI-018-005A	AH6729
Pressure Differential Indicator 2	365-PDI-018-005B	**TBD**
Pressure Differential Indicator 3	365-PDI-018-005C	**TBD**
Pressure Differential Transducer 1	365-PDT-018-005A	**TBD**
Pressure Differential Transducer 2	365-PDT-018-005B	**TBD**
Pressure Differential Transducer 3	365-PDT-018-005C	**TBD**

2.0 SPECIAL TOOLS/EQUIPMENT/MATERIALS

MATERIAL LIST

Item	Material Description	Qty	Unit	Warehouse Stock No.
1	Sierra Digital Mass Flowmeter (FIC/FCV)	AR	Ea	RMS-08-01021
2	Transducer, Differential, 0-15 PSID, Omega	AR	Ea	RMS-06-02001
3	Aerosol cleaner	AR	Ea	X-12-00010

PERSONAL PROTECTIVE EQUIPMENT (PPE)

Description
PPE as determined from WP 12-IS.03, Table 8-1

SPECIAL TOOLS/EQUIPMENT

Description
Laptop Computer with Sierra SmartTrak2 program
Wire brush, brass
Pressure Source

MEASUREMENT & TESTING EQUIPMENT (M&TE)

Instrument Description	Instrument Number	Cal Due Date	Cal Data Verified Current M&TE Initials
Pressure Calibrator, Calibrated			
Pressure Module, Calibrated			
Process Calibrator, Calibrated			
Mass Flow Calibrator, Calibrated			

3.0 PRECAUTIONS/LIMITATIONS

3.1 PRECAUTIONS

RADIOLOGICAL HAZARD exists. Craft may be exposed to a Radiological Hazard if equipment is in a Radiological Area.

ELECTRICAL HAZARD exists. Craft may be exposed to an Electrical Hazard while working inside panel.

PINCH POINT HAZARD exists. Craft may be exposed to a Pinch Point Hazard while closing panel doors and changing instruments.

SLIPS/TRIPS HAZARD exists. Craft may be exposed to Slips/Trips Hazard while climbing stairway and moving about the work area.

3.2 LIMITATIONS

NONE

4.0 PREREQUISITES

4.1 PREREQUISITES

[ ] 4.1.1 Field Work Supervisor (FWS) **CONDUCT** pre-job brief in accordance with WP 04-AD3030, *Pre-Job Briefings and Post-Job Reviews,* **AND DISCUSS** the Personal Protective Equipment (PPE) required and possible Thermal Stress issues to perform the job.

_____
FWS/DATE

[ ] 4.1.2 **OBTAIN** items shown in Section 2.0, Special Tools/Equipment/Materials.

[ ] 4.1.3 **NOTIFY** CMR AND FSM of maintenance activities.

_____
CRAFT/DATE

[ ] 4.1.4 RCT, **SECURE** skid for maintenance per 12-HP1305/12-HP1325.

_____
RCT/DATE

4.2 PERFORMANCE/USAGE DOCUMENTS

- WP 12-IS.03 Electrical Safety Program Manual (Table 8-1)

4.3 RADIOLOGICAL WORK PERMIT (RWP) REQUIREMENTS

[ ] 4.3.1 Rad Con Operations (RCO), **PERFORM** a RWP evaluation, **AND RECORD** RWP number below.

RWP #_____ ☐ N/A

_____/_____
RCO/DATE

[ ] 4.3.2 **IF** RWP is required,
THEN all personnel **READ AND DISCUSS** the RWP, radiological hazards, precautions and mitigating actions to be taken as documented in the RWP,
AND SIGN the RWP. ☐ N/A

_____/_____
RCT/DATE

NOTE

1. Deficiencies, if any, will be documented on the Work Status Log (WSL) and FWS notified.
2. Each skid is comprised of three (3) Fixed Air Samplers (FAS). Generic instructions are provided for testing all three FASs and separate Data Blocks for each FAS are provided in the skid-specific attachments.
3. Craft may operate valves and pumps as necessary during the performance of this procedure.

5.0 PERFORMANCE

5.1 WORK AREA CONFIGURATION AND HAZARD MITIGATION

- **ENSURE** work is performed in accordance with approved Electrical Task Risk Assessment (ETRA) form.
- **MAINTAIN** situational awareness to avoid pinch points and slips/trips.

5.2 FLOW CONTROL INSTRUMENTATION CALIBRATION

[ ] 5.2.1 **DISCONNECT** sampler tubing from inlet side of flow control valve (FCV) being checked.

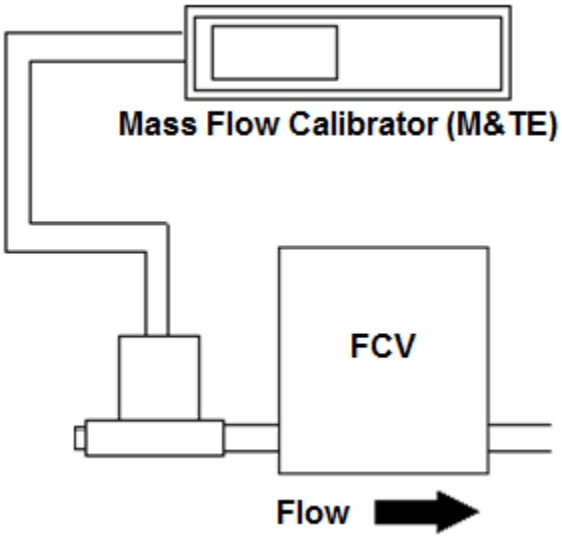

Figure 1 – Test Setup

[ ] 5.2.2 **CONNECT** Mass Flow Calibrator to FCV inlet side per Figure 1, **AND PROVIDE** minimum five pipe diameters between Mass Flow Calibrator and FCV being checked.

[ ] 5.2.3 **IF** desired for use,
THEN CONNECT laptop computer.

[ ] 5.2.4 **ESTABLISH** communications with CMR or CMS.

[ ] 5.2.5 **IF** laptop computer is used,
THEN ACCESS Sierra SmartTrac2 program.

NOTE

For flow control valve flow set point changes a laptop computer with Sierra Smart Trak program can be connected to flow control valve or the local display unit can be used. Either method is acceptable and will require use of password "**0000**".

[ ] 5.2.6 **IF** pump is **NOT** already running,
THEN START pump.

[ ] 5.2.7 **ALLOW** flow to stabilize for valve under test.

[ ] 5.2.8 **VARY** flow values per Data Block for FCV under test,
AND RECORD "As Found" values on applicable Data Block.

[ ] 5.2.9 **LOWER** flow rate set point approximately 0.5 SCFM below normal (2.00 SCFM) operating flow rate.

[ ] 5.2.10 **RAISE** flow rate to normal (2.00 SCFM) operating flow rate.

[ ] 5.2.11 **ALLOW** control loop to stabilize.

[ ] 5.2.12 **RECORD** "As Found" flow indication in Precision Data Block for FCV under test.

[ ] 5.2.13 **RAISE** flow rate set point to approximately 0.5 SCFM above normal (2.00 SCFM) operating flow rate.

[ ] 5.2.14 **LOWER** flow rate to normal (2.00 SCFM) operating flow rate.

[ ] 5.2.15 **ALLOW** control loop to stabilize.

[ ] 5.2.16 **RECORD** "As Found" flow indication in Precision Data Block for FCV under test.

[ ] 5.2.17 **REPEAT** Step [ ] 5.2.9 through Step [ ] 5.2.16 for total of four (4) data points in "As Found" section of Precision Data Block for FCV under test.

[ ] 5.2.18 **REPEAT** Step [ ] 5.2.1 through Step [ ] 5.2.17 until calibration check is completed for all three (3) FCVs.

[ ] 5.2.19 **IF** all “As Found” values are within tolerance per FCV 1, 2 and 3,
THEN RECORD as “As Left” in FCV 1, 2 and 3
AND GO TO Step [ ] 5.2.22.

_____
CRAFT/DATE

[ ] 5.2.20 **IF** “As Found” values are not within tolerance,
THEN GO TO Section 5.4.

[ ] 5.2.21 **IF** after replacing FIC/FCV “As Found” values are still not within tolerance,
THEN GO TO Section 5.5, **AND CONTACT** FWS.

[ ] 5.2.22 **STOP** pump.

[ ] 5.2.23 **DISCONNECT** Mass Flow Calibrator from FCV.

[ ] 5.2.24 **RECONNECT** sampler tubing.

_____
CRAFT/DATE

[ ] 5.2.25 **GO TO** Section 5.5.

5.3 INTERNAL FILTER SCREEN REPLACEMENT

[ ] 5.3.1 **REMOVE** internal filter screen located inside out-of-tolerance FCV.

[ ] 5.3.2 **REPLACE** internal screen filter.

_____
CRAFT/DATE

[ ] 5.3.3 **RE-PERFORM** Step [ ] 5.2.1 through Step [ ] 5.2.17
AND RECORD “As Left” data in applicable Data Blocks for remaining FCVs.

[ ] 5.3.4 **REPEAT** Step [ ] 5.3.1 through Step [ ] 5.3.4 for any FCV failing Section 5.2.

[ ] 5.3.5 **IF** all “As Found” data is within tolerance per applicable Data Blocks,
THEN RECORD as “As Left” AND GO TO Section 5.5.

_____
CRAFT/DATE

NOTE

The FCVs and Flow Indicating Controllers are store-stocked as a unit and should be replaced as a set.

5.4 FIC/FCV REPLACEMENT

[ ] 5.4.1 **IF** replacement valve is not available
THEN GO TO Section 5.5.

[ ] 5.4.2 **REMOVE** installed FIC/FCV.

[ ] 5.4.3 **INSTALL** new FIC/FCV.

_____
CRAFT/DATE

[ ] 5.4.4 **OBTAIN** copy of applicable Data Block(s)
AND REPEAT Steps [ ] 5.2.1 through [ ] 5.2.17 for each replaced FIC/FCV pair.

[ ] 5.4.5 **IF** after replacing FIC/FCV “As Found” values are still not within tolerances on appropriate Data Block,
THEN CONTACT FWS.

5.5 DIFFERENTIAL PRESSURE (DP) TRANSDUCER CHECK

[ ] 5.5.1 **ENSURE** DP sensor tubing is labeled for appropriate DP transducer port.

[ ] 5.5.2 **DISCONNECT** DP transducer sensor tubing from P1 and P2.

[ ] 5.5.3 **CONNECT** M&TE to DP Transducer.

[ ] 5.5.4 **VARY** input pressure per Data Block 2, 3 or 4, as applicable,
AND RECORD “As Found” values in applicable Data Block.

[ ] 5.5.5 **DISCONNECT** M&TE.

[ ] 5.5.6 **RECONNECT** sensor tubing to DP Transducer.

_____
CRAFT/DATE

[ ] 5.5.7 **REPEAT** Step [ ] 5.5.1 through Step [ ] 5.5.6 for remaining DP channels.

[ ] 5.5.8 **IF** "As Found" values are within tolerance per applicable Data Block 2, 3 and/or 4,
THEN RECORD as "As Left" in applicable Data Block
AND GO TO Section 6.0.

_____
CRAFT/DATE

WARNING

ELECTRICAL HAZARD

Craft may be exposed to an Electrical Hazard while working inside panel.

5.6 DP TRANSDUCER REPLACEMENT

[ ] 5.6.1 **ENSURE** voltage greater than or equal to 50V is isolated/insulated.

[ ] 5.6.2 **DISCONNECT** 3 wire plug in connector to transducer.

[ ] 5.6.3 **REMOVE** installed transducer.

[ ] 5.6.4 **INSTALL** new transducer.

_____
CRAFT/DATE

[ ] 5.6.5 **RECONNECT** 3 wire connector to transducer.

[ ] 5.6.6 **OBTAIN** copy of applicable Data Block(s)
AND REPEAT Section 5.5 for each replaced transducer.

6.0 TESTING AND RESTORATION

6.1 POST JOB TESTING

- Successful calibration data satisfies Post Job Testing.

6.2 RESTORATION

[ ] 6.2.1 **ENSURE** skid sampler tubing has been reconnected in correct configuration.

_____
CRAFT/DATE

[ ] 6.2.2 **APPLY** calibration sticker to Control Panel with the following information entered:

- Equipment number
- Calibration date
- Next calibration due date
- I&C Technician stamp

_____
CRAFT/DATE

[ ] 6.2.3 SECOND CRAFT, **VERIFY** calibration sticker is affixed in correct location, and information is accurate and complete.

_____
2nd CRAFT/DATE

[ ] 6.2.4 **NOTIFY** RCT and CMR Air Monitor maintenance is complete.

_____
CRAFT/DATE

[ ] 6.2.5 RCT, **PERFORM** system alignment.

_____
RCT/DATE

[ ] 6.2.6 **ENSURE** DP isolation valves AND FCV isolation valves are OPEN.

_____
RCT/DATE

[ ] 6.2.7 **VERIFY** indicated flow values AND indicated DP values are greater than ZERO.

☐ Greater than ZERO ☐ UNSAT

_____
RCT/DATE

6.3 POST-JOB REVIEW

[ ] 6.3.1 FWS **CONDUCT** post-job review in accordance with WP 04-AD3030, *Pre-Job Briefings and Post-Job Reviews*.
☐ Formal ☐ Informal

_____
FWS/DATE

[ ] 6.3.2 WORK CONTROL (WC), **SUBMIT** scanned (.pdf) file of CHAMPs work order coversheet to “EPA” folder in HWFP inspection Library.

_____
WC/DATE

All personnel affixing initials to these work instructions **PROVIDE** the information listed in the PERSONNEL DATA table below:

PERSONNEL DATA

Printed Name	Signature	Initials	Date

ATTACHMENT 1 – DATA BLOCKS

Check Skid being worked per CHAMPS cover sheet

□ A-2 □ A-3 □ B-1 □ B-2

FCV-1

Data Block 1 – Loop Values

Input Flow Standard (M&TE) Indication			**FIC Flow Indication** (M&TE ±0.14 SCFM)		**CMR Indication** (FIC ±0.14 SCFM)	
Desired Input (SCFM)	**Actual SCFM Input (M&TE)**		**As Found (SCFM)**	**As Left (SCFM)**	**As Found (SCFM)**	**As Left (SCFM)**
	As Found	**As Left**				
0.00						
0.50						
1.00						
1.50						
2.00						
2.50						
3.00						

Precision Data (Normal flow is 2.00 ±0.14 SCFM)

Channel 1	**Data Point 1 ↓**	**Data Point 2 ↑**	**Data Point 3 ↓**	**Data Point 4 ↑**
As Found				
As Left				

FCV-2

Data Block 1 – Loop Values

Input Flow Standard (M&TE) Indication			**FIC Flow Indication** (M&TE ±0.14 SCFM)		**CMR Indication** (FIC ±0.14 SCFM)	
Desired Input (SCFM)	**Actual SCFM Input (M&TE)**		**As Found (SCFM)**	**As Left (SCFM)**	**As Found (SCFM)**	**As Left (SCFM)**
	As Found	**As Left**				
0.00						
0.50						
1.00						
1.50						
2.00						
2.50						
3.00						

Precision Data (Normal flow is 2.00 ±0.14 SCFM)

Channel 1	**Data Point 1** ↓	**Data Point 2** ↑	**Data Point 3** ↓	**Data Point 4** ↑
As Found				
As Left				

FCV-3

Data Block 1 –Loop Values

Input Flow Standard (M&TE) Indication			**FIC Flow Indication** (M&TE ±0.14 SCFM)		**CMR Indication** (FIC ±0.14 SCFM)	
Desired Input (SCFM)	**Actual SCFM Input (M&TE)**		**As Found (SCFM)**	**As Left (SCFM)**	**As Found (SCFM)**	**As Left (SCFM)**
	As Found	**As Left**				
0.00						
0.50						
1.00						
1.50						
2.00						
2.50						
3.00						

Precision Data (Normal flow is 2.00 ±0.14 SCFM)

Channel 1	**Data Point 1** ↓	**Data Point 2** ↑	**Data Point 3** ↓	**Data Point 4** ↑
As Found				
As Left				

Data Block 2

PDI 1			Local Display		CMR Indication		Maximum (PSIG)
Input (PSIG)	Desired Output (PSIG)	Minimum (PSIG)	As Found (PSIG)	As Left (PSIG)	As Found (PSIG)	As Left (PSIG)	
0.00	0.00	-0.43					0.43
3.25	3.25	2.82					3.68
7.50	7.50	7.07					7.93
10.75	10.75	10.32					11.18
15.00	15.00	14.57					15.43

Data Block 3

PDI 2			Local Display		CMR Indication (Station A Only)		
Input (PSIG)	Desired Output (PSIG)	Minimum (PSIG)	As Found (PSIG)	As Left (PSIG)	As Found (PSIG)	As Left (PSIG)	Maximum (PSIG)
0.00	0.00	-0.43					0.43
3.25	3.25	2.82					3.68
7.50	7.50	7.07					7.93
10.75	10.75	10.32					11.18
15.00	15.00	14.57					15.43

Data Block 4

PDI 3			Local Display		CMR Indication (Station A Only)		
Input (PSIG)	Desired Output (PSIG)	Minimum (PSIG)	As Found (PSIG)	As Left (PSIG)	As Found (PSIG)	As Left (PSIG)	Maximum (PSIG)
0.00	0.00	-0.43					0.43
3.25	3.25	2.82					3.68
7.50	7.50	7.07					7.93
10.75	10.75	10.32					11.18
15.00	15.00	14.57					15.43