

0078894

CH2M-0802472

Enclosure 4

241-S-102 WORK PACKAGE AND QUALITY CONTROL ACCEPTANCE INSPECTION

Consisting of 750 pages, including coversheet

attached to 0078880

STANDARD WORK ORDER CLO-WO-07-1840**S-102, Remove Remaining Miscellaneous Equipment****1.0 SCOPE**

- 1.1. This Work Order provides limits, controls and work instructions for performing the following tasks for the S-102 Spill Recovery as shown on ECN-725475-R0, ECN-725344-R0 which includes but is not limited to the following:
- Work site prep and set-up.
 - Perform Radiological and IH surveys
 - Removal and disposal of the HPM Sluice Water Hose
 - Replace existing breather filter with new radial filter.
 - Install electrical and instrument pig tails at existing ENRAF
 - Calibrate ENRAF
 - Install camera at the existing Multi-Port Riser Adapter on riser # 5 and video inside of tank.
 - Complete work site restoration as required.
- 1.2. This work package will work in conjunction with Work Order **CLO-WO-08-0256** which will perform the filter installation per procedure **5-VT-710**.
- 1.3. The equipment which work is being performed identified as General Service (GS).
- 1.4. This work has been determined to be a Standard work package with **High Radiological Risk** activity.

2.0 LIMITATIONS/PRECAUTIONS

- 2.1. This work package will utilize radiological limits and controls specified on **RWP CO-462**.
- 2.2. Refer to Work Hazard Analysis (WHA) for any additional hazards and controls.

- [] 2.3. Do not open pits or risers (or radiological systems, if pits or risers do not apply) if sustained winds are greater than 25 mph.
- A local wind speed measurement device may be utilized in lieu of Hanford Meteorological Station readings, provided the reading is taken in an unobstructed location that is representative of the work area.
 - Use of a local device and the measured wind speed readings taken from it must be documented in the Work Record.
- [] 2.4. To ensure adequate contamination control and worker protection, at no time is it acceptable to breach systems containing radioactive materials without the use of engineering controls, respiratory protection and/or appropriate personal protective clothing. Approved engineered controls include: ventilation, containments, glovebags, sleeving, tents, glove boxes, fixatives, damp/dry rags and or spritzing methods. Deviation from this process requires approval by the applicable facility Radiological Control Director and the corresponding Line Management Director.
- [] 2.5. Tank Farm Contractors (TFC) Environmental representative and Tank Farm Shift Operations Facility shall be notified, in accordance with TFC-ESHQ-ENV_FS-C-01, Environmental Notification, if:
- The initial field count of an air sample with a Beta-Gamma activity is greater than 0.2 DAC and/or
 - The initial field count of an air sample with Alpha activity is greater than 5.0 DAC and/or
 - Results of 7-day decay count of air samples with a total Alpha activity greater than 0.2 DAC.
- Elevated workspace air samples that are suspected to be radon or its daughter products are to be reported to the Environmental On-Call list within 24 hours of field count if radon is **NOT** confirmed. If the sample decay rate is indicative of radon, whether or not the sample remains above 5 DAC alpha within the 24 hour verification period, notification to the Environmental On-Call list is **NOT** required. If the decay rate is not indicative of radon, the Environmental On-Call person **MUST** be notified.
- [] 2.6. During normal work activities, if the work area is left unattended, the FWS is to maintain applicable radiological postings and controls or perform actions necessary to down post the area. Area shall be reposted and controlled upon recommencement of work activities.

- [] 2.7. Spotters are required for all vehicle movement inside the tank farm boundary and follow the route map, when applicable.
- [] 2.8. All hoisting and rigging activities shall comply with the requirements of the Hanford Hoisting & Rigging Manual (DOE-RL-92-36):
- All rigging has a current certification.
 - Perform lift point inspection checks prior to lifting.
 - Lift points are not degraded and have no obvious abnormalities.
 - No lifts to be performed in temperatures below 10°F. Lifting bails may be lifted down to 10°F and No lifts to be performed below 30°F without engineering concurrence.
 - If the lift will not use eyebolts or swivel hoist rings, ensure the ambient outside temperature is greater than 10 degrees Fahrenheit during the lift.
- [] 2.9. The FWS will communicate the requirements of HRA controls and assignment of responsibilities. When an access device for an HRA is removed, one person must be stationed at the access point at all times to provide continuous access control. The identification of this responsibility will be clear to the person responsible (guard) and to all personnel who will need access to the HRA during the course of the work activity.

3.0 PREREQUISITES

NOTE

The steps within Section 3.0 may be worked concurrently or in any order. Ensure applicable prerequisite steps have been completed prior to initiating associated field activities.

- [] 3.1. Prepare work site and stage all materials, equipment & components needed at work location including those listed below:
- | | |
|------------------------------------|------------------------|
| • Plastic ground cover | • Decon materials |
| • Plastic sleeving | • Fixative and sprayer |
| • Rags | • Waste containers |
| • Tape | • Fabricated parts |
| • Tools and materials | • Crane and rigging |
| • Stanchions and signs for posting | • Torque wrench |

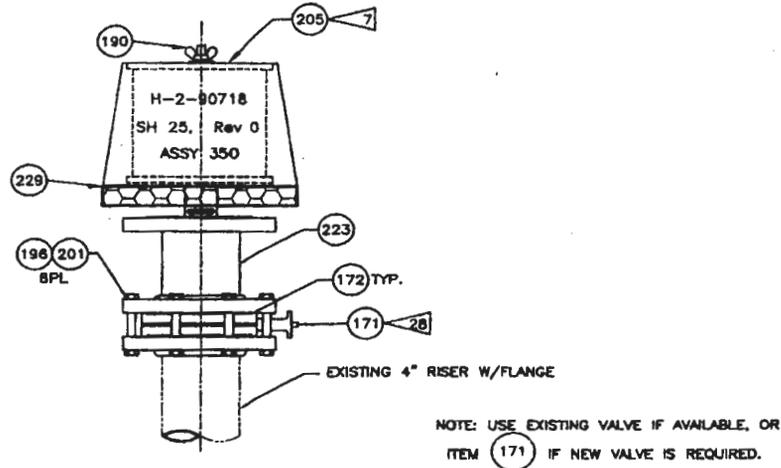
- 3.2. For mechanically lifted loads within 20 ft of tanks, the lower equipment boundary of the lifted item (e.g., bottom of the cover block, thermocouple tree) shall be less than 20 ft above the surface grade or pit floor above the waste storage tank (covered or uncovered)
- 3.3. Ensure the correct waste containers and supplies are available to perform the work activities, as stated on the Waste Planning Checklist.
- 3.4. Ensure Sys. Engineer **Kevin Hull (528-6346)** or designee has been notified prior to video operations.
- 3.5. Maximum allowed insertion depth for camera is **30' 0"** from the top of the multi-port upper flange. This will place the camera at about 15' above the waste.
- 3.6. Inspect new sleeving to be installed for rips, tears, weathering, poor taped joints or other defects.
- Inspected by: *Robert Miller* *1/4/03*
HPT print / signature Date
- 3.7. If traveling over a tank or exclusion zone, ensure route map is included in the work order. See steps below:
- 3.7.1. Engineering is to provide Dome Load information for permanent loads if required and update dome load log book.
- 3.7.2. Ensure that all vehicles used within the tank farm boundary are authorized for access and have current ignition source control stickers.
- 3.8. The IHT will conduct air sampling and monitoring as applicable per the **Monitoring and Sampling Plan # 7X100-JWJ-08-059** or as directed from the Industrial Hygienist.
- 3.8.1. A vapor control zone will be established if the work area monitoring results for ammonia is **≥12ppm**.
- 3.9. Ensure Lock and Tag has been installed, if applicable, for all equipment prior to them being disconnected or reconnected.

[] 3.10. See the following prerequisites to remove the existing breather filter and replace it with a new radial filter:

[] 3.10.1. Ensure new radial filter items are available such as:

- New Filter
- Wing nut
- Weather cover
- Bird screen

[] 3.10.2. Pre-assemble the Radial Filter assembly (in the 2701HV warehouse) per 5-VT-710 and these work instructions so that **Assembly 350** can be staged for the Inspection Checklist acceptance. See Drawings H-2-90718, Sht. 25, 16, & 15, included in work package.



350 40 CFM BREATHER FILTER ASSY. W/4"
VALVE FOR EXISTING 4"-150# FLANGES
SCALE: NONE

[] 3.10.2.1. Ensure valve operator has been oriented, as required to avoid operating interferences with other components when installed in the field. (ref. Drwg. H-2-90718, Sht. 2, Note 28, included in package)

3.10.3. Install the bolts and nuts and TORQUE to 84 (+- 5) ft. lbs.

Torque Wrench

1-22-09

M&TE # 815-88-01-027

Cal Due Date 4/23/08 50
4/23/08

K. WILLOUGHBY

K. Wiloughby

4/23/08

Print

Sign

Date

3.10.4. Ensure the Radial HEPA filter has been QC accepted and CLO-WO-08-0256 is "ready to work".

3.10.5. Ensure EIN labels **S102-WST-V-103** and **S102-WST-FLT-101** have been fabricated and applied to the assembly prior to installation per ECN-725344-R0.

3.10.6. Ensure label has been installed on the radial filter weather cover.

"H-2-90718 Sheet 25, ASSY 350"

in 1/2" black letters per H-2-90718 Sheet 2, Note7 (inc. in work pkg.)

3.10.7. Ensure notification is made to the QAT prior to the new filter assembly being staged in the field. An AG-1 checklist will be completed after installation.

3.11. Ensure Shift Mgr.'s permission has been received to close breather filter isolation valve at S-102.

3.12. Prior to starting field work, ensure the FWS and Rad-Con supervisor have performed a current evaluation of worker "Year-to-Date" radiation exposure provided and have assigned personnel accordingly.

MN Johnson

4-23-08

FWS/Craft Print/Signature

Date

G. DAVIS

4-23-08

Rad-Con Print/Signature

Date

3.13. Ensure a decontamination facility will be operable during activities for this work package.

- 3.14. A maximum of sixty gallons of raw water per incidental discharge is allowed in a contamination area per TFC-ESHQ-ENV-STD-C-01, Water Quality No pooling of liquid is allowed and avoid soil erosion.
- 3.15. Ensure top hat has been fabricated for camera use.
- 3.16. The JRG has specified that the SSW be present at steps 4.4 through 4.9.6. These personnel shall be independent of personnel assigned to perform the work activities.
- 3.17. The JRG has specified that Rad-Con oversight is required at steps 4.4 through 4.9.6. These personnel shall be independent of personnel assigned to perform the work activities.
- 3.18. Lessons Learned Bulletin # **IB-08-003**.
- 3.18.1. Ensure to note when conditions change or controls are not being followed to Stop Work and seek assistance when a change in the work scope is evident.
- 3.19. Ensure that a walkdown is performed with the crew, in as much as possible, after the Work Order has been approved but prior to starting work activities to ensure the work instructions/hazard controls are adequate.

4.0 SPECIFIC WORK INSTRUCTIONS

NOTE

Independent sections 4.4, 4.5, 4.6 and up through step 4.7.5 of the work instructions may be performed in any order and/or concurrently.

Due to the ENRAF pigtail needing to be completed prior to installing the camera, work after step 4.7.5, must be performed last.

FWS to ensure applicable prerequisite steps have been completed prior to initiating associated field work activities in each section.

- 4.1. Ensure prerequisites and precautions/limitations have been reviewed.

- 4.2. HPT to ensure radiological postings are applicable.
- 4.3. Down post the VCZ per procedure TFC-ESHQ-S-IH-C-48, Rev. A (ref. CEHA # 0408-326)
- 4.4. **Removal and disposal of the HPM Sluice Water Hose:**

NOTE

Water capacity of Raw Water hose is approximately 3 gallons

- 4.4.1. HPT perform pre-job radiation and contamination survey of work area and record RSR number.

<i>CAF-007454</i>	<i>14-27-08</i>
RSR (Survey) #	Date
- 4.4.1.1. All subsequent surveys will be documented on Work Record.
- 4.4.2. Unplug the Raw Water hose heat trace from the WDS (Water Distribution Skid)
- 4.4.3. Remove insulation as needed to access the hose at the WDS.
- 4.4.4. Remove heat trace "Ray Chem" junction box at WDS.
- 4.4.5. Install hose clamp near disconnect point at WDS connection.
- 4.4.6. Ensure ground cover/drape is installed at the Water Distribution Skid.
- 4.4.7. Utilizing a damp rag slowly loosen and disconnect the Raw Water line at the (WDS) Water Distribution Skid.
- 4.4.7.1. Install plug/cap on WDS.
- 4.4.7.2. Loosen and remove hose clamp on raw water supply hose at WDS end.

~~N~~ 4.4.7.2.1. Allow hose to drain in a bag with absorbent material then temporarily cap hose, as necessary.

~~[]~~ 4.4.8. Remove insulation as needed to access the hose at the HPM.

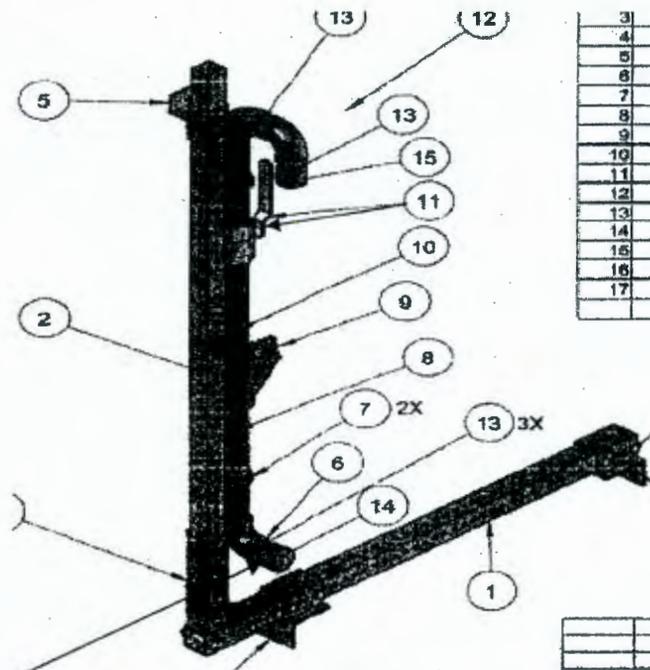
~~[]~~ 4.4.9. Ensure heat trace at WDS has been cut then disconnect/cut heat trace at HPM, as needed.

~~[]~~ 4.4.9.1. Remove HPM heat trace "Ray Chem" junction box, as necessary.

~~[]~~ 4.4.10. Ensure ball valve (shown as number # 11 on detail below) on HPM manifold is **CLOSED**.

~~[]~~ 4.4.11. Install ground cover/drape at the HPM.

~~[]~~ 4.4.12. Utilizing a damp rag slowly loosen and disconnect the Raw Water line lower connection at the HPM, as shown on detail below:



Lower hose connection (item #14, 1 1/2" dia. CAMLOCK Male)
 (Ref. Drawing TMR-06 HFOR-VP2-060)

~~[]~~ 4.4.13. Install plug/cap on HPM manifold lower connection.

- 4.4.14. Remove temporary cap on WDS end of Raw Water hose, if installed and allow hose ends at HPM and WDS to drain into bags with absorbent material then install plug/cap at hose ends.
- 4.4.15. Dispose of Raw Water line.
- 4.5. Install power to existing ENRAF and test.
- 4.5.1. HPT perform pre-job radiation and contamination survey of work area and record RSR number.
- RSR # COF-007454 Date: 4-27-08
- 4.5.1.1. All subsequent surveys will be documented on work record.
- 4.5.2. Remove old power and instrument wiring at ENRAF.
- 4.5.2.1. Install an electrical "pig tail" at the existing ENRAF to enable the connection to temporary power per ECN-725475-R0.
- 4.5.3. Perform electrical and mechanical checks and necessary testing to ensure existing ENRAF is functional and capable:
- 4.5.3.1. Install an instrument cable "pig tail", if needed, at the existing ENRAF to facilitate the calibration of the equipment.
- 4.5.4. Perform ENRAF calibrations per Procedure **5-LCD-300** and recorded on data sheet Attachment #1 to the work instructions, included in work package.
- 4.5.5. Ensure the plummet has been raised in the ENRAF so as not to interfere with camera installation.
- 4.6. Replace existing breather filter with new radial filter and isolation valve.
- 4.6.1. Install ground cover around riser # 1.

~~[]~~ 4.6.2. If ground wire is present remove the ground wire from the breather filter housing and cut or disconnect from the splice point at the riser flange.

~~N~~ 4.6.3. Remove the existing Breather Filter Housing Assembly per ECN-725344-R0, see below:

~~[]~~ 4.6.3.1. Loosen filter access door and drain any accumulated condensate into bag with absorbent pads.

~~[]~~ 4.6.3.1.1. Secure filter access door.

~~[]~~ 4.6.4. Remove bolts at the existing isolation valve.

~~N~~ 4.6.5. Remove the Breather Filter Housing and HEPA Filter together at one time, bag flange and place unit in waste container.

~~N~~ 4.6.6. Install the new radial breather filter assembly with valve on existing wye adapter at Riser # 1 per ECN-725344-R0 and procedure 5-VT-710.

~~[]~~ 4.6.6.1. Install the gasket, nuts, and bolts,
Torque to **84 (+- 5) ft. lbs**

Torque Wrench

M&TE # 815-55-01-027 Cal. Due Date 1-22-09

M W Jensen [Signature] 4-27-08
FWS (Print) (Sign) Date

~~[]~~ 4.6.7. Ensure the Radial HEPA filter media installation was performed in Work Order CLO-WO-08-0256 with new **WT-106183** and that Environmental Compliance and Shift Manager was notified that the filter is installed and the isolation valve is **OPEN.**

~~[]~~ 4.6.8. Ensure isolation valve at the inlet breather filter is **CLOSED.**

4.7. Install the camera equipment at the existing Multi-Port Riser Adapter on riser # 5 and video the inside of the riser and the tank.

SEE WORK RECORD ENTRY #01
PEN & INK CHANGE
R.M. 4/28/08

SECTIONS 4.7, 4.8 & 4.9 MAY BE REPEATED AS NECESSARY WITH CONCURRENCE BY RAD-CON PRIOR TO EACH REPLICATION

4.7.1. HPT perform pre-job radiation and contamination survey of work area and record RSR number.

RSR # COF007454 Date: 4-27-08

4.7.1.1. All subsequent surveys will be documented on work record.

4.7.2. Ensure the ENRAF displacer has been retrieved above the ball valve in the ENRAF assembly before installing the camera.

4.7.3. Install ground cover and drape around riser.

4.7.4. To remove blind flange and install a top hat, see work steps 4.7.5 through 4.7.7. If top hat is already installed N/A these steps and proceed to 4.7.8.

4.7.5. Remove the blind flange.

4.7.6. Bag the blind flange, nuts, bolts and washers for re-use as needed.

4.7.7. Install top hat and tighten bolts.

4.7.8. Install sleeving on top hat.

NOTE

Notify Engineer (Kevin Hull @ 528-6346, 376-0145) prior to installing camera

4.7.8.1. Inspect sleeving for rips, tears, weathering, poor taped joints or other defects and repair or replace, if needed.

4.7.9. Install camera equipment into top hat.

- 4.7.10. Ensure all cables are secured to prevent the equipment (i.e., camera/light) from coming into contact with the tank waste.

- 4.8. Perform a video inspection of the tank.
 - 4.8.1. Ensure video signal is being recorded.
 - 4.8.2. Manipulate the camera equipment per Engineer's directions and videotape the interior of the tank, taking care to include the waste level in the tank.
 - 4.8.3. While performing video, lower ENRAF, video where plummet contacts the waste surface then record ENRAF level in work record.
 - 4.8.3.1. Raise plummet before removing camera.
 - 4.8.4. If camera is not going to be left in riser then proceed to step 4.9.
 - 4.8.5. If camera is going to be left in riser, return camera equipment to its stowed position when complete.
 - 4.8.5.1. Ensure all cables are secured to prevent the equipment (i.e., camera/light) from coming into contact with the tank waste.
 - 4.8.5.2. Place canvas bag over the top hat to prevent degradation of the plastic sleeving/bag.

- 4.9. Removal of camera/supplemental light at riser # 5 as follows:
 - 4.9.1. Ensure ground cover and drape around riser has been installed.
 - 4.9.2. Ensure camera is positioned straight down.
 - 4.9.3. De-energize camera equipment power supply.
 - 4.9.3.1. Allow at least 10 minutes for light to cool before removing camera equipment.

CAUTION

Slowly remove the last 10 feet of camera equipment to ensure monitoring control of dose rates and personnel exposures

- 4.9.4. Remove substantial bag from the top hat, if installed.
- 4.9.5. Inspect sleeving on top hat and repair or replace, as needed.
- 4.9.6. Remove camera equipment from the riser into containment sleeving and apply approved shielding to camera/light, if needed.
- 4.10. Dispose of waste per the Waste Planning Checklist.
- 4.11. Perform work area clean-up.
- 4.12. HPT perform post-job radiation and contamination survey(s) of the work area.

_____/_____
 RSR Number / Date

- 4.13. Record on the Work Record that the job site has been cleaned, post-walkdown performed, the area is orderly, and all waste has been placed in the proper containers.

5.0 MAINTENANCE TESTING

- 5.1. QAT re-verify torque after approximately 24 hours.

- 5.1.1. Re-Torque to **84 (+- 5) ft. lbs.**
Torque Wrench

M&TE # 815-8801-027 Cal Due Date 1-22-09

K. Willoughby / K. Willoughby / 4-29-08
 QAT Name Sign Date

- 5.2. An AG-1 checklist will be completed after the radial HEPA filter installation work activity.
- 5.2.1. QAT perform applicable portions of the Radial Flow Breather Filter Assembly Post-Installation Inspection Checklist.
- 5.3. Engineer is to accept this calibration on the ENRAF and update the PM data sheet WT-3653, in CHAMPS.

6.0 RESTORATION ACTIONS

- 6.1. FWS will ensure a copy the video will be forwarded to System Eng.
- 6.2. QAT verify that the Radial Flow Breather Filter Assembly Post-Installation Inspection Checklist has been signed and completed.

K. W. Loughry K. W. Loughry 4/28/08
QAT Name Signature Date

- 6.3. System Engineer is to ensure that the old Data Sheets have been discontinued and new Data Sheet WT-106183 has been activated.

[Signature] [Signature] 4/28/2008 4/28/08
System Engineer Signature Date

- 6.4. System Engineer is to ensure ECN-725475-R0 and ECN-725344 R-0 have been closed and a copy of the "MODIFICATION COMPLETE" cover page has been inserted into the work package.

_____/_____/_____
System Engineer Signature Date

- 6.5. FWS record FWC completion in CHAMPS.

- 6.6. Forward completed work order for OPS review and acceptance.

NOTE

The following Post Review actions are not required to consider the field work complete or for Operations Acceptance

- 6.7. Schedule a post-job ALARA review meeting no later than 30 calendar days after completion of the field work portion of the work document.

- 6.8. Rad-Con SME to close the RWP in the ACES system, if no longer needed.

_____ / _____
Rad-Con SME (Print/Sign) . Date

- 6.9. Environmental closeout review completed.

_____ / _____
Environmental (Print & Sign) . Date

- 6.10. Closeout Review

RPP WORK RECORD

Document Number:

CLO-WO-07-1840

2. Work Item Title: 241-S-102, Remove Remaining Equipment

Date	Turnover, Problem Description, Action Taken	Feed Back (X)	Name	Craft/Resource Type	Hours
12/3/07	Completed Walk-Down. All required attendees were present. See Roster scanned into CHAMP		R. Matthews	PLNR	N/A
3/13/08	Held team planning Meeting to discuss and define the scope of the work pkg. See Roster in Work pkg. Work Scope was changed by Project Team		R. Matthews	PLNR	N/A
4/1/08	TPM held to govern work instr. All attendees were helpful and it was a good meeting. See Roster in work package		R. Matthews	"	"
4/16/08	Pre-TRG meeting was held and some areas of change were needed. Work instructions were updated with steps to all new butterfly valve. See Roster in work pkg.		R. Matthews	"	"
4/21/08	TRG was held and actions recorded. PKG was approved/commented.		R. Matthews	PLNR	N/A
4/22/08	TRG Action Items completed and signed off by TRG CHAIRMAN Ron Tucker.		R. Matthews	PLNR	N/A
4/22/08	Work pkg signed off by Ron Tucker per telecom via Rick Matthews and FWS MARK JOHNSON per telecom via Rick Matthews		R. Matthews	PLNR	N/A
4/22/08	USQ TF-08-0695-D		R. Matthews	PLNR	N/A

Summary by Craft/Resource Type

Craft/Resource Type	Total Hours	Craft/Resource Type	Total Hours

RPP WORK RECORD

Document Number:

CLO-WO-07-1840

2. Work Item Title: 241-S-102, Remove Remaining Equipment

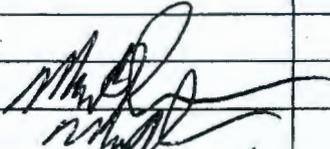
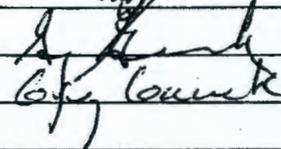
Date	Turnover, Problem Description, Action Taken	Feed Back (X)	Name	Craft/Resource Type	Hours
4-23-08	No field work performed due to high winds.				
4-24-08	No field work performed - High winds - Please release crane tomorrow.				
4-25-08	No field work - High Winds Please release for Sunday days.				
4-23-08 4-24-08					
4-27-08	Remove G-1 breather filter and install the new radial filter. Removed low pressure water line on HPM (NE corner) Powered up S-102 ENRAF - installed new 110V pigtail and new instrument cable. Obtained liquid level (31.12 in.) Installed top hat and camera in riser 5. Still need to perform video inspection ^(mv) 4-27-08 inspection. After inspection is complete - Remove camera and top hat, install blind flange				
Pen & Ink #01	Due to equipment failure it may be necessary to replace the camera so change #01 adds note prior to step 4.7.1 to rework or repeat sections 4.7, 4.8, & 4.9 as necessary with concurrence from Rad-Con prior to each repetition. Use Caterpillar 08-0731-5		K. H. H. Kilbow Portellon Brenn 	EMER JRL JRG RadCon Sme FWS BANKER BEST / JB	N/A
Summary by Craft/Resource Type					
Craft/Resource Type	Total Hours	Craft/Resource Type	Total Hours		

RPP WORK RECORD

Document Number:

CLO-WO-07-1840

2. Work Item Title: 241-S-102, Remove Remaining Equipment

Date	Turnover, Problem Description, Action Taken	Feed Back (X)	Name	Craft/Resource Type	Hours
4-28-08	Tongued flange on new radial filter - All tanguing				
4-28-08	Mod is complete.				
	Performed video of tank notes, need to continue video, may need to change out camera. RSR # COT-0074 59				
4-28-2008	IMC data sheets WT-03705 and WT-06789 put into DISCONTINUED status following replant with radial breather filter assembly under Work Docs CLO-WO-07-1840 and CLO-WO-08-0256 on 4/27/08. WT-106183 activated based on start date of 4/27/08. Mod Work complete ECN-925344 RD extend job w. P.		 Eng. Council	ENG L	

Summary by Craft/Resource Type

Craft/Resource Type	Total Hours	Craft/Resource Type	Total Hours

RADIOLOGICAL WORK PERMIT	Contractor: CH2M HILL Harland Group, Inc.	RWP Number CO-462
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General: []	Start Date 04/22/2008	End Date 10/21/2008	Technical Document Number(s): CLO-WO-07-1840	AMW Number AW-1400
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Job Location: 200W/241-S/S-102	Brief Job Description and Type of Area: Remove Miscellaneous Equipment (RA, HRA, CA, HCA, ARA)
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Radiation Emitted	Estimated Dose Rates	Estimated Contamination Levels	Job Dose Estimate	Risk Value
[X] Alpha	General Area: 0.5 mrem/hr	Beta/Gamma: <1000 dpm/100 cm ²	1397 person-mrem	HIGH
[X] Beta	Maximum Contact: 20 mrem/hr	Alpha: <20 dpm/100 cm ²		
[X] Gamma	Radiological Worker [] I		Internal Dosimetry Requirements	
[] Neutrons	Training Req. [X] II			
[] 3 minute WBC [X] 10 minute [] Urinalysis/Isotopes [] Chest Count WBC				

DOSIMETRY		PERSONAL PROTECTIVE EQUIPMENT			SURVEY REQUIREMENTS	
X	HSD-TLD	X	Coveralls		Shoe Covers	SI 8 Grab Air Sampling Required
	HCND-TLD	SI 6	Waterproof Suit	X	Canvas Boots	SI 8 Lapel Air Sampling Required
SI 5	Pocket Dosimeter		Goretex Suit	X	Rubber Overshoes	SI 7 Auto. Survey Device
SI 5	Electronic Dosimeter		Cap		Rubber Boots	SI 7 Self Survey (if qualified)
SI 5	Finger Rings	SI 6	Hood		Face Shield	HPT Exit Survey Required
	Time Keeping		Surgeon's Gloves	SI 6	Full Face Respirator	
X	Entry Control System	SI 6	Leather Gloves		PAPR	HPT COVERAGE
	Brick	SI 6	Canvas & Surgeon's Gloves		Supplied Air Respirator	SI 4 Continuous
	-Day ACES Auth.		Waterproof Gloves		SCBA	SI 4 Intermittent
		SI 6	Arm Sleeves		Undressing Assistance	
		SI 3	Leaded Gloves			

SPECIAL INSTRUCTIONS

1. VOID LIMITS
 - HRA: Whole body dose rate > 10 Rem/hour at 30 cm.
 - RA: Whole body dose rate > 100 mrem/hour at 30 cm.
 - CA: General area removable contamination levels ≥100,000 dpm/100cm² beta-gamma or ≥210 dpm/100 cm² alpha.
 - HCA: General area removable contamination levels ≥840 mrad/hour/100cm² beta-gamma or ≥40,000 dpm/100 cm² alpha.
 - EXTREMITIES: Extremity dose rates > 75,000 mrem/hour.
2. SAFE CONDITION LEVELS

If a Safe Condition Level is met, place the work area in a stable condition, stop normal work activities, perform the action(s) stated within the associated Safe Condition Level AND notify the RadCon First Line Manager and Shift Operations Manager that a Safe Condition Level was reached or exceeded.

 - HRA: Whole body dose rate > 5 Rem/hour at 30 cm. over riser, replace riser cover and return to planning phase.
 - HCA: General area removable contamination levels ≥320 mrad/hour/100cm² beta-gamma or ≥20,000 dpm/100 cm² alpha; apply approved fixative.
 - EXTREMITIES: Extremity exposure rate > 15,000 mrem/hour; use remote handling techniques (long handle tools) and reduce time to minimize extremity exposure levels.
3. ACTION LEVELS
 - CA: General area removable contamination ≥50,000 dpm/100cm² beta-gamma or ≥70 dpm/100cm² alpha, decontaminate or apply fixative to reduce contamination below these levels prior to continuing work activities
 - HCA: General area removable contamination in access corridor and change tent ≥ 100,000 dpm/100cm² beta-gamma or ≥210 dpm/100cm² alpha; decontaminate to reduce contamination below these levels prior to continuing work activities
 - RA: Whole body dose rate > 80 mrem/hr; post HRA boundary as necessary.
 - EXTREMITIES: Extremity exposure > 500 mrem/hr perform actions as follows;
 - If exposure to the hands, don leaded gloves or increase distance from source to reduce exposure rate to below this level.
 - If exposure to the feet, apply rubber matting.
4. HPT COVERAGE
 - Continuous HPT coverage is required for all work activities involving HCA
 - Intermittent coverage is required during setup and cleanup activities outside the HCA
5. DOSIMETRY/ACES
 - Personnel entering any HRA will wear an electronic dosimeter on the front-waist area of the outer set of PPE. Dosimeter will have the dose alarm set at 80% of the remaining ACL or as directed by Radcon management; dose rate alarm shall be set at 1500 mrem/hr.
 - Personnel performing hands on work with contaminated components shall wear finger rings and shall ACE in with the appropriate GW or WW Role and the COBIO Role.
6. PERSONAL PROTECTIVE EQUIPMENT
 - CA: Single set of PPE and a second set of gloves (e.g. canvas, surgeons, leather, cannery, etc.) required for entry.
 - A hood will be worn when:
 - a worker's head has a potential to contact contaminated surfaces,
 - contamination may drop from above due to overhead work
 - in an ARA
 - HCA:
 - An additional pair of gloves, with arm sleeves is required for reaching from a CA into an HCA.
 - Double set of PPE, two hoods and a third set of gloves (e.g. canvas, surgeons, leather, cannery, etc.) required for whole body entry into an HCA.
 - Waterproof PPE: If cloth PPE is at risk of becoming wet due to precipitation or from using liquids inside the CA/HCA; don appropriate waterproof PPE as per RadCon direction.
 - ARA: A minimum of an APR with a particulate filter required for access.
7. SURVEY
 - Beta-Gamma and Alpha surveys required during the course of all intrusive work:
 - Alpha surveys of personnel and equipment required if alpha contamination was detected during the course of performing work.
 - Alpha survey required if Beta-Gamma contamination is detected.
 - Auto Survey Device (ASD) requirements:
 - If ASD does not have alpha survey capabilities for areas requiring dual personnel surveys, perform a whole body Alpha survey prior to entering ASD.
 - If ASD is inoperable or unavailable, perform whole body survey(s). Perform a follow-up survey in an operable ASD.
8. AIR SAMPLING
 - Work place grab air sampling is required.
 - Lapel air sampling is required for a representative amount of personnel wearing respirators for radiological purposes
9. SPECIAL PREJOB BRIEFING
 - N/A
10. OTHER
 - All personnel performing work on this RWP must have attended the pre-job briefing

COPY

RWP Prepared By: S.B. Holcomb <i>[Signature]</i> Phone: 373-1263		HPT Phone: 373-3353, 438-9294	
Line Mgt. Print: <i>[Signature]</i> Sign: <i>[Signature]</i>	RC Sup. Initial: <i>[Signature]</i>	RC Dir. Print: <i>[Signature]</i> Sign: <i>[Signature]</i>	Date: 4-22-08
Acknowledged by: <i>[Signature]</i>	AJRG Chair (High Risk) Print: <i>[Signature]</i> Sign: <i>[Signature]</i>	Date: 4/22/08	Other: Print: Sign: Date:
RWP Field Change Approvals:	Line Mgt. Print: Sign:	Date:	RC Mgt. Print: Sign: Date:

SAFETY IS NO ACCIDENT

PRE-JOB BRIEFING

Job Description/Title
S-102, REMOVE REMAINING EQUIPMENT

Date
4-28-08

Work Order No.:
CLO-WO-07-1840

Supervisor:

Place a check mark in all that apply

* Use as applicable for General Pre-Job Briefings
Required for medium or high radiological risk work activities

Define the Work

- #*Work Scope
- *Purpose and nature of work
- #*Tasks and Critical Tasks
- *Tasks assignments
- *Procedural or Work Instruction Adherence/Use
- #*Roles and Responsibilities
- *Special qualifications or training
- Handoffs
- Controlling Authority
- Outside Resources Required
-

Special Requirements or Unusual Conditions

- #*Interface with other organizations
- *Potential Communication obstacles
- #*Other Work in the Area
- Changes in Scope or Work Conditions
- #*Procedure questions or errors
- Equipment line-up/configuration
- #Hold Points, and who is responsible to complete
-

Hazards and Controls

- #*Review the Worksite Hazard Analysis (WHA)
- #*Discuss the controls and PPE identified in the WHA
- *Discuss the precautions in the work instructions
- *Discuss any warnings or cautions listed in the work instruction or procedure
- *Error Likely situations
- Discuss contingency plans
- #*Discuss the permits and their controls
- #*Discuss any ALARA aspects of the work
- Discuss Voluntary Use of Respirators
- Discuss engineered or administrative controls for Radiological Containments
-

Lockout Tag-out Requirements

- *Review Tagout Authorization and Tags
- Identify affected employees
- *Identify Authorized workers
- Identify Primary Authorized worker (if used)
- *Authorized Worker Lock and Tag
- *Personal Locking Devices
-

Prerequisites

- #*Review the prerequisites listed in work instructions or procedures
- Review Communication requirements (What, Who, When) (Three-Way Communications)
- Tools, Materials, or Equipment required to be staged
- *Technical Specification Requirements (TSRs)
- *Limiting Condition for Operations (LCOs)
- *Valve Manipulation Walkdowns (see Pre-Job Briefing procedure)
- Oversight Requirements (Senior Supervisory Watch)
-

Abnormal Events

- #*Emergency Response
- *Alarm Response
- Location of Nearest:
 - o Spill Kit
 - o Operable Safety Shower
 - o Operable Decontamination facility
 - o Event response equipment, supplies, personnel
- *Roles and Responsibilities for Injury, Spills, etc.
- *Lessons Learned
-

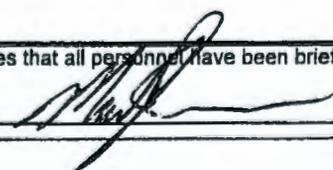
Post Work Activities

- #*House Keeping/Final Cleanup
- *Post Maintenance Testing
- Post Job Reviews/Debriefs
- Post Job ALARA review
-

Comments

Supervisor signature and date indicates that all personnel have been briefed on the areas indicated by a check mark.

Supervisor Signature



Date

4-28-08

Johnson 4-1608

Job/Task No.: CLO-WO-07-1340 WORKSITE HAZARD ANALYSIS Date: 4-16-08

Hazards	Possible Controls	Applicable PPE
<input checked="" type="checkbox"/> Electrical	<input checked="" type="checkbox"/> Lock out/Tag out <input type="checkbox"/> Barricade <input type="checkbox"/> Electrical Energized Work Permit <input type="checkbox"/> PPE Category (-1 to 4) specify _____ <input type="checkbox"/> AED Location Known/Available	<input checked="" type="checkbox"/> Hard Hat <input checked="" type="checkbox"/> Eye/Face Protection
<input checked="" type="checkbox"/> Crane or other Lifting Equipment Lifting and rigging objects	<input type="checkbox"/> Special/Critical Lift Permit <input checked="" type="checkbox"/> Signalman assigned <input checked="" type="checkbox"/> Lifting equip inspected <input checked="" type="checkbox"/> Area around crane barricaded <input checked="" type="checkbox"/> Spotter <i>NO WORK TO BE DONE UNDER A SUSPENDED LOAD</i>	<input checked="" type="checkbox"/> Safety Glasses and side shields <input type="checkbox"/> Face Shield <input type="checkbox"/> Face Shield ARC <input type="checkbox"/> Chemical Goggles <input type="checkbox"/> Welding Hood <input type="checkbox"/> Other: _____
<input checked="" type="checkbox"/> Vehicular Traffic and/or Heavy Equipment	<input type="checkbox"/> Traffic Barricades <input type="checkbox"/> Cones <input type="checkbox"/> Signs <input checked="" type="checkbox"/> Flagman <input type="checkbox"/> Lane closure <input checked="" type="checkbox"/> Communication with equipment operator <input type="checkbox"/> Surface condition	<input type="checkbox"/> Other: _____
<input type="checkbox"/> Overhead Utilities	<input type="checkbox"/> De-energization req. <input type="checkbox"/> Insulation blankets req. <input type="checkbox"/> Wire watcher req. <input type="checkbox"/> Req. clearance distance <input type="checkbox"/> Safe work zone marked	<input checked="" type="checkbox"/> Hearing Protection <input checked="" type="checkbox"/> Ear Muffs <i>Behind crane du ops</i> <input type="checkbox"/> Specify type: _____ <input type="checkbox"/> Foam/Ear Plugs
<input type="checkbox"/> Falls (Scaffolding, Ariel lifts, Ladders, Roof work)	<input type="checkbox"/> Inspect general ladder condition before use <input type="checkbox"/> Current Ladder inspections <input type="checkbox"/> Ladder tied off <input type="checkbox"/> Proper angle/placement of ladders <input type="checkbox"/> Proper ladder size <input type="checkbox"/> 100% Tie Off of tools from lifts/scaffolds <input type="checkbox"/> Scaffold User Inspection before use <input type="checkbox"/> Competent Person Inspection of Scaffold <input type="checkbox"/> Fall Protection Plan <input type="checkbox"/> Roof Assessment	<input checked="" type="checkbox"/> Gloves <input type="checkbox"/> Silver Shield <input type="checkbox"/> Canvas <input type="checkbox"/> Latex <input type="checkbox"/> Nitrile <input type="checkbox"/> PVC <input type="checkbox"/> Neoprene <input type="checkbox"/> Chemical Resistant Gloves <input type="checkbox"/> Specify: _____
<input type="checkbox"/> Moving/Falling objects from height	<input type="checkbox"/> Tether small objects <input type="checkbox"/> Use rope, canvas bag <input type="checkbox"/> Barricade around potential fall area <input type="checkbox"/> Barricade tape <input type="checkbox"/> Hard hats <input type="checkbox"/> Tie off tools/materials <input type="checkbox"/> Warning signs <input type="checkbox"/> Cover over opening <input type="checkbox"/> Rigid railing required	<input type="checkbox"/> Insulated Gloves <input type="checkbox"/> Vibration Dampening <input checked="" type="checkbox"/> Leather Gloves <i>Co needed</i> <input type="checkbox"/> Rubber Gloves <input type="checkbox"/> Voltage Rated Gloves NFPA-70 <input type="checkbox"/> Other: _____
<input type="checkbox"/> Excavations	<input type="checkbox"/> Excavation/Shoring Permit <input type="checkbox"/> Inspect prior to entering <input type="checkbox"/> Competent Person Inspection <input type="checkbox"/> Proper sloping/shoring <input type="checkbox"/> Access/egress provided <input type="checkbox"/> Scans <input type="checkbox"/> Barricades	<input type="checkbox"/> Other: _____
<input type="checkbox"/> Underground Utilities (Line Locating)	<input type="checkbox"/> Reviewed ground scans <input type="checkbox"/> Received excavation permit <input type="checkbox"/> Maintain clearance distance <input type="checkbox"/> Safe work zone marked <input type="checkbox"/> Insulated hand tools	<input type="checkbox"/> Other: _____
<input type="checkbox"/> Fire Hazard, weld, burn, grind, solder	<input type="checkbox"/> Fire Extinguishers <input type="checkbox"/> Fire Watch <input type="checkbox"/> Respiratory Protection <input type="checkbox"/> Adjacent area protected <input type="checkbox"/> Unnecessary flammable material removed <input type="checkbox"/> Hot Work Permit	<input type="checkbox"/> Other: _____
<input checked="" type="checkbox"/> Noise > 85 dBA	<input checked="" type="checkbox"/> Hearing protection <i>around crane</i> <input type="checkbox"/> Noise monitoring (IH)	<input checked="" type="checkbox"/> Foot Protection
<input type="checkbox"/> High Energy Air/Steam/Fluid > 500 PSI or > 200 degrees	<input type="checkbox"/> Depressurize <input type="checkbox"/> PPE <input type="checkbox"/> Whip Check Tie-downs <input type="checkbox"/> Cool down systems <input type="checkbox"/> Lock Out/Tag Out	<input checked="" type="checkbox"/> Protective footwear w/ankle support <input type="checkbox"/> Substantial footwear <input type="checkbox"/> Rubber Boots <input type="checkbox"/> Rubber Boots cover <input type="checkbox"/> Dielectric Footwear <input type="checkbox"/> Chemical Resistant Footwear <input type="checkbox"/> Other: _____
<input type="checkbox"/> Stored Energy	<input type="checkbox"/> Lock Out/Tag Out <input type="checkbox"/> Remove energy <input type="checkbox"/> PPE	
<input checked="" type="checkbox"/> Rotating/Moving Equipment or Pinch points	<input type="checkbox"/> Lock Out/Tag Out <input type="checkbox"/> Machine guards in place <input checked="" type="checkbox"/> Block parts against motion <input type="checkbox"/> PPE <input checked="" type="checkbox"/> Hand/Body position <input type="checkbox"/> Remove Loose clothing	

Job/Task No.:

CLO-WO-07-1840

WORKSITE HAZARD ANALYSIS (continued)

Date:

4-16-08

Hazards (continued)	Possible Controls (continued)	Applicable PPE (continued)
<input checked="" type="checkbox"/> Working With Chemicals (Examples: Lead, Beryllium, Asbestos, Acids, Bases, Paints, Glues, Solvents)	<input checked="" type="checkbox"/> Obtain MSDS and review controls <input type="checkbox"/> Have proper containers & labels <input type="checkbox"/> PPE <input type="checkbox"/> Fume Hoods, Glove boxes, etc. <input type="checkbox"/> Safety Showers identified <input type="checkbox"/> Eye wash station <input type="checkbox"/> Asbestos Work Permit <input type="checkbox"/> IH Monitoring Plan # _____ <input type="checkbox"/> Ventilation/Engineering Control	<input checked="" type="checkbox"/> Respiratory Protection <input checked="" type="checkbox"/> APR <input type="checkbox"/> PAPR <input type="checkbox"/> Airline <input checked="" type="checkbox"/> SCBA (Voluntary) <input type="checkbox"/> Carri-Air <input type="checkbox"/> Specify Cartridges: _____
<input type="checkbox"/> Laboratory Hazards <input type="checkbox"/> Chemical Splashes <input type="checkbox"/> Chemical Compatibility <input type="checkbox"/> Reactive <input type="checkbox"/> Time Sensitive	<input type="checkbox"/> PPE <input type="checkbox"/> Chemical Segregation <input type="checkbox"/> Volume limitations <input type="checkbox"/> Special Labeling or postings <input type="checkbox"/> Fume Hoods	<input type="checkbox"/> Special Clothing <input type="checkbox"/> Tyvek <input type="checkbox"/> NFPA-70 Rated <input type="checkbox"/> Normex III <input type="checkbox"/> Rain Suit <input type="checkbox"/> Safety Vest <input type="checkbox"/> Silver Shield Apron, etc. <input type="checkbox"/> Other: _____
<input type="checkbox"/> Pressurized Gas Cylinders	<input type="checkbox"/> Caps on while moving <input type="checkbox"/> Secured while moving or stored <input type="checkbox"/> Suitable lifting moving device	
<input checked="" type="checkbox"/> Potential Contact with Tank Waste	<input type="checkbox"/> Silver shield PPE (Gloves, hood, apron) <input type="checkbox"/> Respiratory protection	
<input type="checkbox"/> Confined Space	<input type="checkbox"/> Confined Space permit	
<input type="checkbox"/> Wall/Ceiling Penetration	<input type="checkbox"/> Scanned area where penetration will take place <input type="checkbox"/> Perform Walk Around	
<input checked="" type="checkbox"/> Radiological <input checked="" type="checkbox"/> Radiological Material <input checked="" type="checkbox"/> Radiological exposure <input checked="" type="checkbox"/> Radiological contamination <input type="checkbox"/> Loose or airborne contamination <input checked="" type="checkbox"/> Fixed contamination disturbed <input type="checkbox"/> Radiological generating device <input checked="" type="checkbox"/> Radiological system breached	<input checked="" type="checkbox"/> Radiological Work Permit # <u>C0-462</u> <input checked="" type="checkbox"/> Radiological Screening process <input checked="" type="checkbox"/> ALARA Management Worksheet <input checked="" type="checkbox"/> Minimize Time in area (use of mockups, automated systems, etc.) <input checked="" type="checkbox"/> Maximize Distance to source of radiation (extension tools, remote operated equip., etc.) <input checked="" type="checkbox"/> Use of Shielding <input type="checkbox"/> Reduce item generating concern (contamination or radiation source) <input checked="" type="checkbox"/> Respiratory Protection <input type="checkbox"/> Contain source of contamination concern <input checked="" type="checkbox"/> Apply approved fixative	<p>Sakyaal - 020641 Sample Green 012261</p>
<input type="checkbox"/> Flammable Gases	<input type="checkbox"/> Bonding <input type="checkbox"/> Intrinsically safe tools/equipment	
<input checked="" type="checkbox"/> Temperature Extremes <input checked="" type="checkbox"/> Heat Stress <input type="checkbox"/> Cold Stress	<input type="checkbox"/> Use Heat Stress Mitigation Checklist <input type="checkbox"/> Warming Hut <input checked="" type="checkbox"/> Frequency of Breaks	
<input checked="" type="checkbox"/> Tank Farm Vapors	<input checked="" type="checkbox"/> IH Monitoring and Sampling Plan # <u>See other</u> <input type="checkbox"/> Temp. VCZ	
<input checked="" type="checkbox"/> Lack of Adequate Lighting	<input type="checkbox"/> Change work to daytime <input checked="" type="checkbox"/> Temporary lighting (Light stand or flashlight, etc.) <u>if worked at night</u>	

Other:

7X100-JW-08-059 Air Monitoring & Air Sampling Plan for S, SX & SY Form Work Activities

CLO-WO-07-1840
241-S-102 REPLACE BREATHER FILTER WITH RADIAL FILTER
(AND BUTTERFLY VALVE)

Attachment
Radial Flow Breather Filter Assembly Post-Installation Inspection
Checklist

Purpose: Visual inspection is used to assess items such as surface condition, alignment of mating surfaces, shape, or evidence of other damage.

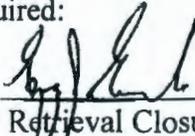
Scope: Visual inspections shall be performed on the breather filter assembly components and interconnecting ductwork as outlined in the following checklists (make additional copies as needed). The inspections are limited to items that are readily accessible, without disassembly (for example, many items are not easily assessed inside the completed assemblies). Some radial filters may also be assembled onto new wye assemblies. Because disassembly is not desirable, especially after installation, the inspections should occur and be documented during fabrication and pre- and post-installation activities (as applicable). Items that were previously inspected (e.g., by the manufacturer) cannot be inspected or are not applicable shall be indicated as such on the checklist, with justification/evidence given in the comments column as appropriate (do not delete items from the checklists).

Acceptance Criteria: Unless otherwise noted in the following checklists, **conditions are considered acceptable when there is no visual indication of improper installation, physical damage, structural distress or degradation that would impair the ability of the component/system to perform its intended function.**

Required Inspector: Quality control shall complete (as applicable) and sign each data sheet.

Originated by:

Signature Required:

 / Gregory J. Gauck
Retrieval Closure Ventilation System Engineer

4/21/2008
Date

VISUAL INSPECTION CHECKLIST
DAMPERS (including valves used as dampers)
Butterfly valve on ductwork (Assembly for Radial Flow Filter)

Item #	Inspection Item	Requirement Reference	QC Acceptance (initial & date)	Comments (use comments continuation sheet as needed)
DM-1	Housing and duct interface	ASME AG-1, Section TA-I-1200 (a)	KW 4/22/08	No housing. Duct interface only.
DM-2	Actuator linkage, motor, controller	ASME AG-1, Section TA-I-1200 (b)	N/A	Valve design does not have any actuator linkages, motors, or controller.
DM-3	Interferences with moving parts	ASME AG-1, Section TA-I-1200 (c)	N/A (completed via other inspection or process)	The only moving parts are internal to the damper, verified through functional testing.
DM-4	Damper shaft seal	ASME AG-1, Section TA-I-1200 (d)	N/A	Valve design has no damper shaft.
DM-5	Blade edge seals, damper seat	ASME AG-1, Section TA-I-1200 (e)	N/A (completed via other inspection or process)	Seal integrity is verified by testing per ASME B16.34 and verified during procurement activities. Vacuum decay testing also ensures adequate seal during field installation.
DM-6	Limit switches	ASME AG-1, Section TA-I-1200 (f)	N/A	Valve design has no limit switches.
DM-7	Supports and attachments	ASME AG-1, Section TA-I-1200 (g)	N/A	Valve design has no supports or attachments other than its interface with the duct (wye assembly) to which it bolts (covered in DM-1).
DM-8	Bolting and fasteners	ASME AG-1, Section TA-I-1200 (h)	KW 4/24/08	1ST TORQUE KW 4/23/08 2ND TORQUE KW 4/24/08
DM-9	Instrumentation	ASME AG-1, Section TA-I-1200 (i)	N/A	Valve design has no instrumentation.
DM-10	Electrical connections	ASME AG-1, Section TA-I-1200 (j)	N/A	Valve design has no electrical connections.

VISUAL INSPECTION CHECKLIST
DAMPERS (including valves used as dampers)
Butterfly valve on ductwork (Assembly for Radial Flow Filter)

Item #	Inspection Item	Requirement Reference	QC Acceptance (initial & date)	Comments (use comments continuation sheet as needed)
DM-11	Pneumatic connections	ASME AG-1, Section TA-I-1200 (k)	N/A	Valve design has no pneumatic connections.
DM-12	As built configuration in accordance with design drawings	ASME AG-1, Section TA-I-1200 (l)	N/A (completed via other inspection or process)	Normal engineering and work control processes perform this function.
DM-13	Damper nameplate	ASME AG-1, Section TA-I-1200 (m)	KW 4/22/08	See valve damper on H-2-90718 Sht.10 latest rev and Note for Item 171.
DM-14	Provisions for access for performing tests and maintenance	ASME AG-1, Section TA-I-1200 (n)	KW 4/28/08	

Quality Control (print name, signature, date):

K. Willoughby / *KW [Signature]* 4/28/08

**VISUAL INSPECTION CHECKLIST
TANK-TO-BREATHER FILTER CONNECTING DUCTWORK
(Mounting Flange Subassembly)**

Item #	Inspection Item	Requirement Reference	QC Acceptance (initial & date)	Comments (use comments continuation sheet as needed)
DW-1	Housing and duct connections (no caulking)	ASME AG-1, Section TA-I-1300 (a)	JE 4-27-08	Mounting flange subassembly- to- riser connection.
DW-2	Provision for opening access doors from both inside and outside	ASME AG-1, Section TA-I-1300 (b)	N/A	By design, there are no doors.
DW-3	Access door seals, gaskets	ASME AG-1, Section TA-I-1300 (c)	N/A	By design, there are no doors.
DW-4	Access door latches	ASME AG-1, Section TA-I-1300 (d)	N/A	By design, there are no doors.
DW-5	Housing internal access ladders and platforms	ASME AG-1, Section TA-I-1300 (e)	N/A	By design, there is no housing.
DW-6	Sample and injection ports, location and caps	ASME AG-1, Section TA-I-1300 (f)	N/A	By design, there are no test ports.
DW-7	Supports and attachments	ASME AG-1, Section TA-I-1300 (g)	N/A	Connection to riser addressed in DW-1. There are no separate supports or attachments.
DW-8	Bolting and fasteners	ASME AG-1, Section TA-I-1300 (h)	JE 4-27-08 KW 4/28/08	1st. torque 2nd FIKDUC
DW-9	Instrumentation connections	ASME AG-1, Section TA-I-1300 (i)	N/A	By design, there are no instrumentation connections.
DW-10	Electrical connections	ASME AG-1, Section TA-I-1300 (j)	N/A	By design, there are no electrical connections.
DW-11	Housing/duct penetration seals	ASME AG-1, Section TA-I-1300 (k)	N/A	By design, there is no housing.

VISUAL INSPECTION CHECKLIST
TANK-TO-BREATHING FILTER CONNECTING DUCTWORK
(Mounting Flange Subassembly)

Item #	Inspection Item	Requirement Reference	QC Acceptance (initial & date)	Comments (use comments continuation sheet as needed)
DW-12	Loop seals (water level), drain connections	ASME AG-1, Section TA-I-1300 (l)	N/A	By design, there are no loop seals or drain lines.
DW-13	Lighting conduits, socket housing seals (flush mounted)	ASME AG-1, Section TA-I-1300 (m)	N/A	By design, there are no lighting conduits.
DW-14	HEPA/adsorber mounting frame continuous seal welds	ASME AG-1, Section TA-I-1300 (n)	N/A	By design, there is no mounting frame.
DW-15	Mounting frame penetrations seal welded	ASME AG-1, Section TA-I-1300 (o)	N/A	By design, there is no mounting frame.
DW-16	Mounting frame seating surface (weld splatter, flatness, scratches)	ASME AG-1, Section TA-I-1300 (p)	KW 4/22/08	By design, there is no mounting frame. This is for inspection of the threaded hole in the flange.
DW-17	Sample canister installation	ASME AG-1, Section TA-I-1300 (q)	N/A	By design, there is no sample canister.
DW-18	Mounting frame clamping devices	ASME AG-1, Section TA-I-1300 (r)	N/A	By design, there is no mounting frame.
DW-19	As built configuration in accordance with design drawings	ASME AG-1, Section TA-I-1300 (s)	N/A (completed via other inspection or process)	Normal engineering and work control processes perform this function.
DW-20	Provisions for access for performing tests and maintenance	ASME AG-1, Section TA-I-1300 (t)	KW 4/28/08	Verify filter will be accessible for replacement. No tests required.

**VISUAL INSPECTION CHECKLIST
TANK-TO-BREATHER FILTER CONNECTING DUCTWORK
(Mounting Flange Subassembly)**

Item #	Inspection Item	Requirement Reference	QC Acceptance (initial & date)	Comments (use comments continuation sheet as needed)
DW-21	Lighting for test and maintenance available	ASME AG-1, Section TA-I-1300 (u)	N/A	Not applicable to this assembly (facility or portable lighting used as necessary).

Quality Control (print name, signature, date):

K. Willoughby / K. Willoughby 7/28/08

**VISUAL INSPECTION CHECKLIST
EXHAUSTER HEATER/FILTER/TEST HOUSINGS
(Radial Flow HEPA Filter)**

Item #	Inspection Item	Requirement Reference	QC Acceptance (initial & date)	Comments (use comments continuation sheet as needed)
EH-1	Housing and duct connections (no caulking)	ASME AG-1 Section TA-I-1300 (a)	N/A	By design, there is no housing.
EH-2	Provision for opening access doors from both inside and outside	ASME AG-1 Section TA-I-1300 (b)	N/A	By design, there are no doors.
EH-3	Access door seals, gaskets	ASME AG-1 Section TA-I-1300 ©	N/A	By design, there are no doors.
EH-4	Access door latches	ASME AG-1 Section TA-I-1300 (d)	N/A	By design, there are no doors.
EH-5	Housing internal access ladders and platforms	ASME AG-1 Section TA-I-1300 (e)	N/A	By design, there is no housing.
EH-6	Sample and injections ports, location and caps	ASME AG-1 Section TA-I-1300 (f)	N/A	By design, there are no injection ports.
EH-7	Supports and attachments	ASME AG-1 Section TA-I-1300 (g)	N/A	By design, there are no supports or attachments.
EH-8	Bolting and fasteners	ASME AG-1 Section TA-I-1300 (h) and section TA-I-1600 (g)	N/A	By design, there is no bolting/fasteners.
EH-9	Instrumentation connections	ASME AG-1 Section TA-I-1300 (i)	N/A	By design, there are no instrumentation connections.
EH-10	Electrical connections	ASME AG-1 Section TA-I-1300 (j)	N/A	By design, there are no electrical connections.

**VISUAL INSPECTION CHECKLIST
EXHAUSTER HEATER/FILTER/TEST HOUSINGS
(Radial Flow HEPA Filter)**

Item #	Inspection Item	Requirement Reference	QC Acceptance (initial & date)	Comments (use comments continuation sheet as needed)
EH-11	Housing/duct penetration seals	ASME AG-1 Section TA-I-1300 (k)	N/A	By design, there is no housing.
EH-12	Loop seals (water level), drain connections	ASME AG-1 Section TA-I-1300 (l)	N/A	By design, there is no loop seal or drain.
EH-13	Lighting conduits, socket housing seals (flush mounted)	ASME AG-1 Section TA-I-1300 (m)	N/A	By design, there are no lighting conduits/seals.
EH-14	HEPA/adsorber mounting frame continuous seal welds	ASME AG-1 Section TA-I-1300 (n)	N/A	By design, there is no mounting frame.
EH-15	Mounting frame penetrations seal welded	ASME AG-1 Section TA-I-1300 (o)	N/A	By design, there is no mounting frame.
EH-16	Mounting frame scating surface (weld splatter, flatness, scratches)	ASME AG-1 Section TA-I-1300 (p)	KW 4/22/08	There is no mounting frame. This is for inspection of the threaded nipple of the radial flow filter.
EH-17	Sample canister installation	ASME AG-1 Section TA-I-1300 (q)	N/A	A sample canister is not used in this application.
EH-18	Mounting frame clamping devices	ASME AG-1 Section TA-I-1300 (r)	N/A	No mounting frame clamping devices.
EH-19	As built configuration in accordance with design drawings	ASME AG-1 Section TA-I-1300 (s) and Section TA-I-1600 (h)	N/A (completed via other inspection or process)	By design, there is no housing. HEPA filter configuration is controlled via vendor drawings.

VISUAL INSPECTION CHECKLIST
EXHAUSTER HEATER/FILTER/TEST HOUSINGS
(Radial Flow HEPA Filter)

Item #	Inspection Item	Requirement Reference	QC Acceptance (initial & date)	Comments (use comments continuation sheet as needed)
EH-20	Provisions for access for performing tests and maintenance	ASME AG-1 Section TA-I-1300 (t) and Section TA-I-1600 (j)	N/A	By design, there is no test or maintenance required.
EH-21	Lighting for test and maintenance available	ASME AG-1 Section TA-I-1300 (u)	N/A	By design, there is no test or maintenance required.
EH-22	Moisture separator media, frame, clamps, and gaskets	ASME AG-1 Section TA-I-1600 (a)	N/A	Moisture separator is not part of this design.
EH-23	Moisture separator water collection system and drains	ASME AG-1 Section TA-I-1600 (b)	N/A	Moisture separator is not part of this design.
EH-24	Prefilter media, frame, clamps, and gaskets	ASME AG-1 Section TA-I-1600 ©	N/A	By design, there is no prefilter.
EH-25	HEPA filter media, frame, clamps, and gaskets	ASME AG-1 Section TA-I-1600 (d)	KW 4/22/08	By design, there are no clamps or gaskets. Inspect filter media and frame.
EH-26	Sealant or caulking (none allowed)	ASME AG-1 Section TA-I-1600 (e)	KW 4/22/08	Anti-galling media (gray Teflon tape) approved for use on threaded nipple on filter. This is covered by the procedure (5-VT-710) used for the filter installation activity.
EH-27	Moisture separator, prefilter, HEPA orientation (vertical)	ASME AG-1 Section TA-I-1600 (f)	N/A	By design, the HEPA filter cannot inadvertently be installed in the incorrect orientation. There is no moisture separator or prefilter.

**VISUAL INSPECTION CHECKLIST
EXHAUSTER HEATER/FILTER/TEST HOUSINGS
(Radial Flow HEPA Filter)**

Item #	Inspection Item	Requirement Reference	QC Acceptance (initial & date)	Comments (use comments continuation sheet as needed)
EH-28	HEPA filter nameplate	ASME AG-1 Section TA-I-1600 (i)	KW 4/22/08	This data is recorded on the 5-VT-710 data sheet for filter replacement.

Quality Control (print name, signature, date):

K. Willoughby / *K. Willoughby* 4/29/08

SAFETY IS NO ACCIDENT

PRE-JOB BRIEFING

Job Description/Title
S-102, REMOVE REMAINING EQUIPMENT

Date
4-27-05

Work Order No.:
CLO-WO-07-1840

Supervisor:
M. Johnson

Place a check mark in all that apply

* Use as applicable for General Pre-Job Briefings
Required for medium or high radiological risk work activities

Define the Work

- #*Work Scope
- *Purpose and nature of work
- #*Tasks and Critical Tasks
- *Tasks assignments
- *Procedural or Work Instruction Adherence/Use
- #*Roles and Responsibilities
- *Special qualifications or training
- Handoffs
- Controlling Authority
- Outside Resources Required

Hazards and Controls

- #*Review the Worksite Hazard Analysis (WHA)
- #*Discuss the controls and PPE identified in the WHA
- *Discuss the precautions in the work instructions
- *Discuss any warnings or cautions listed in the work instruction or procedure
- *Error Likely situations
- Discuss contingency plans
- #*Discuss the permits and their controls
- #*Discuss any ALARA aspects of the work
- Discuss Voluntary Use of Respirators
- Discuss engineered or administrative controls for Radiological Containments

Prerequisites

- #*Review the prerequisites listed in work instructions or procedures
- Review Communication requirements (What, Who, When) (Three-Way Communications)
- Tools, Materials, or Equipment required to be staged
- *Technical Specification Requirements (TSRs)
- *Limiting Condition for Operations (LCOs)
- *Valve Manipulation Walkdowns (see Pre-Job Briefing procedure)
- Oversight Requirements (Senior Supervisory Watch)

Special Requirements or Unusual Conditions

- #*Interface with other organizations
- *Potential Communication obstacles
- #*Other Work in the Area
- Changes in Scope or Work Conditions
- #*Procedure questions or errors
- Equipment line-up/configuration
- #Hold Points, and who is responsible to complete

Lockout Tag-out Requirements

- *Review Tagout Authorization and Tags
- Identify affected employees
- *Identify Authorized workers
- Identify Primary Authorized worker (if used)
- *Authorized Worker Lock and Tag
- *Personal Locking Devices

None

Abnormal Events

- #*Emergency Response
- *Alarm Response
- Location of Nearest:
 - o Spill Kit
 - o Operable Safety Shower
 - o Operable Decontamination facility
 - o Event response equipment, supplies, personnel
- *Roles and Responsibilities for Injury, Spills, etc.
- *Lessons Learned

Post Work Activities

- #*House Keeping/Final Cleanup
- *Post Maintenance Testing
- Post Job Reviews/Debriefs
- Post Job ALARA review

Comments

Supervisor signature and date indicates that all personnel have been briefed on the areas indicated by a check mark.

Supervisor Signature M. Johnson

Date 4-27-05

**CH2M HILL
ATTENDANCE ROSTER**

Subject:

CLO-WO-07-1840
S-102, REMOVE REMAINING EQUIPMENT

Date: 4-27-08

Leader:

inn Johnson

NAME (Print)	Signature	Position/Title	Organization
M J Gulon	<i>M J Gulon</i>	NCO	BO
Bill Samson	<i>Bill Samson</i>	NCO	BO
T. Kenworthy	<i>T. Kenworthy</i>	NCO	BO
Steve Stumper	<i>Steve Stumper</i>	NCO	BO
Jeff Lucas	<i>Jeff Lucas</i>	NCO	BO
T. Garza	<i>T. Garza</i>	NCO	B.O.
J. Rodriguez	<i>J. Rodriguez</i>	HAMTC Rep	B.O.
Miller, T.W.	<i>T.W. Miller</i>	NCO	B.O (west)
Rhonda Stumper	<i>Rhonda Stumper</i>	HPT	
DALE GUNTER	<i>Dale Gunter</i>	INSULATOR	BO
Rodney Greene	<i>Rodney Greene</i>	INSULATOR	BO
SK Bolt	<i>SK Bolt</i>	ELECT	BO
Gale L. Buck	<i>Gale L. Buck</i>	I.W.	FH
John Alley	<i>John Alley</i>	I.W.	FH
Scott Snook	<i>Scott Snook</i>	NCO	CO
M J ARMSTRONG	<i>M J Armstrong</i>	NCO	BO
S D WILSON Jr	<i>S.D. Wilson Jr</i>	NCO	BOSS

CH2M HILL ATTENDANCE ROSTER

Subject:
CLO-WO-07-1840
S-102, REMOVE REMAINING EQUIPMENT

Date: 4-27-08

Leader:
M. Johnson

NAME (Print)	Signature	Position/Title	Organization
Don Wyatt	<i>Don Wyatt</i>	P/F	MAINT
Ronald A. Simkins	<i>Ronald A. Simkins</i>	P/F	MAINT.
Kenan Tasci	<i>Kenan Tasci</i>	P/F	MAINT.
David VOLKMAN	<i>David Volkman</i>	P/F	Maint
Jon Elliott	<i>Jon Elliott</i>	QC	QA
CHARLIE SCHER	<i>Charlie Scher</i>	SM	FH
Ben Davis	<i>Ben Davis</i>	HPT	CHG
Chris Williams	<i>Chris Williams</i>	HPT	CHG
G. Williams	<i>G. Williams</i>	NO	R
G. Gunnskey	<i>G. Gunnskey</i>	HPT	
Randy Cook	<i>Randy W. M. Cook</i>	SSW	BaseOps
RM YASEK	<i>RM Yasek</i>	FR APP	ORD
<i>J. J.</i>	<i>Greg Seidl</i>	NCO	CI
Taylor	<i>Taylor</i>	NCO	BO
Reed	<i>Reed</i>	HPT	CHG
L. Roberts	<i>L. Roberts</i>	HPT	CHG

**CH2M HILL
ATTENDANCE ROSTER**

Subject:
CLO-WO-07-1840
S-102, REMOVE REMAINING EQUIPMENT

Date: 4-27-08

Leader:
M.A. Johnson

NAME (Print)	Signature	Position/Title	Organization
M.R. CHUNN	<i>M.R. Chunn</i>	NCO	BO
Villarreal	<i>[Signature]</i>	NCO	BO
<i>[Signature]</i>	<i>[Signature]</i>	IHT	BO
Sullivan W.F.	<i>[Signature]</i>	IHT	BO
Kevin Gustafson	<i>[Signature]</i>	IHT	BO
Steve Sant	<i>[Signature]</i>	IHT	BO
JD Shupe	<i>[Signature]</i>	NCO	CO
T. Perez	<i>[Signature]</i>	NCO	BO
<i>[Signature]</i>	<i>[Signature]</i>	NCO	CO
Jenna Kahlert	<i>[Signature]</i>	IHT	Kadorn
SR Joseph	<i>[Signature]</i>	NCO	CO
D. GEEK	<i>[Signature]</i>	NCO	BO
W.R. Taylor	<i>[Signature]</i>	NCO	BO
Jason Green	<i>[Signature]</i>	NCO	CO

SAFETY IS NO ACCIDENT

PRE-JOB BRIEFING

Job Description/Title
S-102, REMOVE REMAINING EQUIPMENT

Date
4-24-08

Work Order No.:
CLO-WO-07-1840

Supervisor:
M.W. Johnson

Place a check mark in all that apply

* Use as applicable for General Pre-Job Briefings
Required for medium or high radiological risk work activities

Define the Work

- #*Work Scope
- *Purpose and nature of work
- #*Tasks and Critical Tasks
- *Tasks assignments
- *Procedural or Work Instruction Adherence/Use
- #*Roles and Responsibilities
- *Special qualifications or training
- Handoffs
- Controlling Authority
- Outside Resources Required

Hazards and Controls

- #*Review the Worksite Hazard Analysis (WHA)
- #*Discuss the controls and PPE identified in the WHA
- *Discuss the precautions in the work instructions
- *Discuss any warnings or cautions listed in the work instruction or procedure
- *Error Likely situations
- Discuss contingency plans
- #*Discuss the permits and their controls
- #*Discuss any ALARA aspects of the work
- Discuss Voluntary Use of Respirators
- Discuss engineered or administrative controls for Radiological Containments

Prerequisites

- #*Review the prerequisites listed in work instructions or procedures
- Review Communication requirements (What, Who, When) (Three-Way Communications)
- Tools, Materials, or Equipment required to be staged
- *Technical Specification Requirements (TSRs)
- *Limiting Condition for Operations (LCOs)
- *Valve Manipulation Walkdowns (see Pre-Job Briefing procedure)
- Oversight Requirements (Senior Supervisory Watch)

Special Requirements or Unusual Conditions

- #*Interface with other organizations
- *Potential Communication obstacles
- #*Other Work in the Area
- Changes in Scope or Work Conditions
- #*Procedure questions or errors
- Equipment line-up/configuration
- #Hold Points, and who is responsible to complete

Lockout Tag-out Requirements

- *Review Tagout Authorization and Tags
- Identify affected employees
- *Identify Authorized workers
- Identify Primary Authorized worker (if used)
- *Authorized Worker Lock and Tag
- *Personal Locking Devices

Abnormal Events

- #*Emergency Response
- *Alarm Response
- Location of Nearest:
 - Spill Kit
 - Operable Safety Shower
 - Operable Decontamination facility
 - Event response equipment, supplies, personnel
- *Roles and Responsibilities for Injury, Spills, etc.
- *Lessons Learned

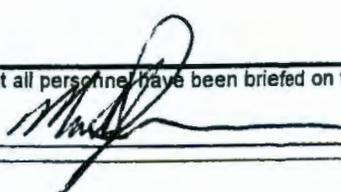
Post Work Activities

- #*House Keeping/Final Cleanup
- *Post Maintenance Testing
- Post Job Reviews/Debriefs
- Post Job ALARA review

Comments

Supervisor signature and date indicates that all personnel have been briefed on the areas indicated by a check mark.

Supervisor Signature



Date

4-24-08

25
M.W. Johnson
4-25-08

**CH2M HILL
ATTENDANCE ROSTER**

Subject:
CLO-WO-07-1840
S-102, REMOVE REMAINING EQUIPMENT

25
Date: 4-24-08
Leader: ^{WJ} W. Johnson
WJ Johnson

NAME (Print)	Signature	Position/Title	Organization
MJ ARMSTRONG	<i>MJ Armstrong</i>	NCO	
MR CHUNN	<i>Mr Chunn</i>	NCO	BO
JR Maasen	<i>JR Maasen</i>	LNCO	BO
WE Perry	<i>WE Perry</i>	HPT	BO
TR MOONEY	<i>TR Mooney</i>	HPT	BO
B. Bricer	<i>B. Bricer</i>	IW	FIH
K. ANGLER	<i>K. Angler</i>	IW	SCIR
K E NORRIS	<i>K E Norris</i>	CRANE OP	SCIR
Kurt Obermeyer	<i>Kurt Obermeyer</i>	IW/Rigger	FIH
R. Eadie	<i>R E Eadie</i>	Driver	FIH
J Lucas	<i>J Lucas</i>	NCO	BO BO
C Hoffman sr.	<i>C Hoffman sr.</i>	NCO	BO
Bill Samson	<i>Bill Samson</i>	NCO	BO
T. Kenworthy	<i>T Kenworthy</i>	NCO	BO
Steve Rhodes	<i>Steve Rhodes</i>	HPT	BO
_____	<i>PETE Gomez</i>	NCO	BO
Guinn	<i>Guinn</i>	NCO	BO
WR Taylor	<i>WR Taylor</i>	NCO	BO
Steve Sharp	<i>Steve Sharp</i>	NCO	BO
Caylor	<i>Caylor</i>	NCO	BO
Nelson	<i>Nelson</i>	HPT	BO
J GRANT	<i>J Grant</i>	INSULATOR	BO

WORK RELEASE CHECKLIST FOR OE'S
(For Operations Pre-Release Review)

Work Package No.: CLO-WO-07-1840 Reviewed By: Rajiv Malhan Date: 04/22/08

Title: S-102 Remove Remaining Misc. Equipment

Document Check:

N/A YES

- Work Instructions
- Data Sheets
- BOM
- CACN listed
- Hold Points
- Waste Planning Checklist
- WHA / JSA
- Pre-Job Safety Meeting form
- Attendance Roster
- RWP
- ALARA Management Worksheet
- OTP (Operational Test Procedure)
- ATP (Acceptance Test Procedure)
- USQ Eval. # (TE-08-0695-D)
- ECNs (# 725344, R-0)
(# 725344, R-0) (# _____)
- Reference Drawings
- Lockout / Tagout Authorization or AWT form prepared
- Asbestos Work Permit / Negative Exposure Assessment
- Hot Work Permit (fire watch required)
- Confined Space Entry Permit
- Non-Permit Confined Space monitoring form
- Excavation Permit
- Ground Scan
- EEWP
- Procedures
- Vehicle Route Map
- Critical Lift Procedure
- Hoisting and Rigging Information
- MSDS Sheets
- Glove Bag / Containment Form
- Ignition Source Control Requirements Screening
- Standing Orders

Limiting Conditions for Operation (LCOs):

N/A YES

- 3.1.1 Transfer Leak Detection Systems
- 3.1.2 Backflow Prevention Systems
- 3.2.1 DST Primary Ventilation Systems
- 3.2.2 SST Flammable Gas Concentration
- 3.2.3 SST 241-B-203 and 241-B-204
Passive Ventilation Systems

Administrative Controls (ACs):

N/A YES

- 5.10 Flammable Gas Controls
- 5.11 Transfer Controls
- 5.12 Administrative Lock Controls
- 5.13 Bulk Chemical Addition Controls
- 5.14 Dome Loading Controls
- 5.15 Tank Farm Instrumentation
- 5.16 Corrosion Mitigation Controls
- 5.17 Vacuum Retrieval Controls

242-A Administrative Controls (ACs):

N/A YES

- 5.6.1.1 Restriction on 242-A Pump Room and
Evaporator Room Access
- 5.6.1.2 Sample Cubicle Leak Detection
- 5.6.1.4 Fire Protection
- 5.6.1.11 242-A Evaporator Instrumentation

Comments:

WORK RELEASE CHECKLIST FOR OE'S (continued)

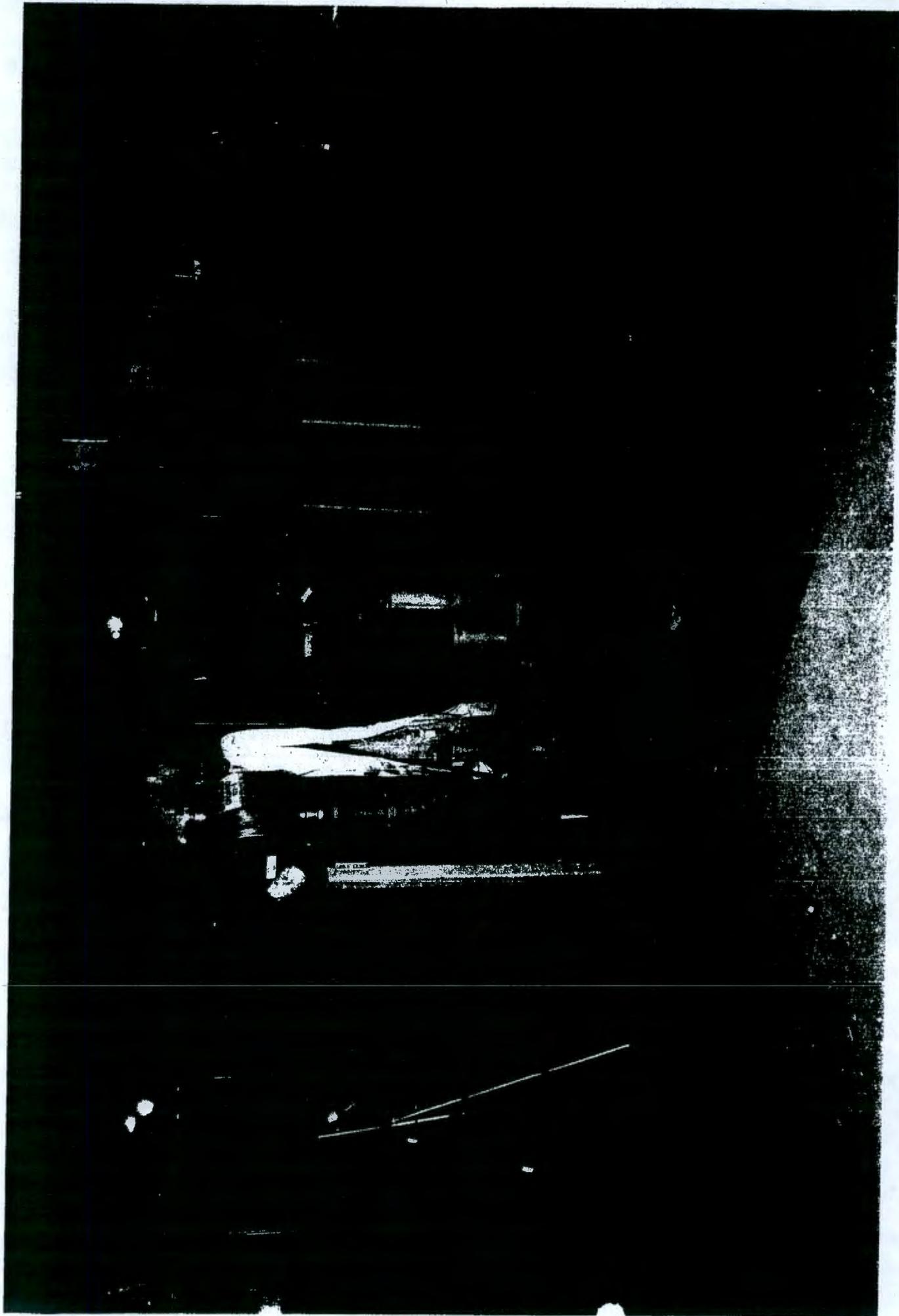
(For Operations Pre-Release Review)

Work Package No.: CLO-WO-07-1840 Reviewed By: Rajiv Malhan Date: 04/22/08

Title: S-102 Remove Remaining Misc. Equipment

		YES	N/A
1.	Is configuration of equipment and systems properly identified for safe operation while the work is being performed?	<input checked="" type="radio"/>	<input type="radio"/>
2.	Is operability of the equipment and systems properly restored as part of the retesting? (SS/SC must address retest.)	<input checked="" type="radio"/>	<input type="radio"/>
3.	Are the Lock and Tag steps required to install and remove included in the work document and are the forms complete and in the WP?	<input type="radio"/>	<input checked="" type="radio"/>
4.	Are TSR, LCO, OSD, and AB requirements properly included? (Note for LCO entry/exit.)	<input type="radio"/>	<input checked="" type="radio"/>
5.	Are work scope boundaries clear and the forms complete and in the WP?	<input checked="" type="radio"/>	<input type="radio"/>

Comments:



TANK FARM CHEMICAL EXPOSURE HAZARD ANALYSIS
CLO-WO-07-1840, S-102, Remove Remaining Miscellaneous Equipment
April 24, 2008

0408-326

3. The COPC Chemicals identified in S-Complex Tank Farms were ammonia, nitrous oxide, and nitrosamines.

Data Review:

1. Personal air sampling results for representative work activities conducted in S Complex tank farms from 11/04 – 10/06 showed no COPC exceeded 10% of the Tank Farm Occupational Exposure Limits. 7X100-JWJ-07-006. Results of Personal Air Sampling Conducted in S-Complex Tank Farms from November 2004-October 2006.
2. S-Complex COPC air sampling showed that no COPC exceeded 50% of the Tank Farm occupational exposure limit in the work areas, 5 ft from any recognized vapor source.
3. Review of air sampling and monitoring data up to 4/10/08 at S-102 showed no exposure measurements approaching 10% of the S-Complex Chemicals of Potential Concern.
4. Comparison of the TWINS headspace data between C-103 and S-Complex tanks showed that no COPC's in S-Complex tanks differed by a factor of 4.

Vapor Hazard Controls:

1. The IHT will conduct air sampling and monitoring as per 7X100-JWJ-08-059 Air Monitoring and Air Sampling Plan for S, SX, & SY Farm Work Activities.
2. If IHT monitoring detects ammonia concentrations exceeding the Tank Farm Chemical Action Limit of 12 ppm in the work area during the operation, the work will be paused and the workers placed in a safe configuration and the issue is resolved before the work proceeds. If ammonia levels remain above the chemical action limits for 15 minutes, a vapor control zone will be reestablished around the filters.

Title:	Name:	Signature:	Date:	Phone:
Industrial Hygienist:	J.W. Jabara, CIH		4/24/08	373-1385
IH Reviewer:	ML Zabel		4-24-2008	376-0662
IH Manager:	K. A. Roueche		4/24/08	372-3310
Operations Manager:	R.P. Tucker		4/24/08	

TANK FARM CHEMICAL EXPOSURE HAZARD ANALYSIS
CLO-WO-07-1840, S-102, Remove Remaining Miscellaneous Equipment
April 24, 2008

0408-326

Summary:

The vapor control zone at S-102 can be temporarily down posted for work activity associated with CLO-WO-07-1840, S-102, Remove Remaining Miscellaneous Equipment based upon the following hazard assessment as per TFC-ESHQ-S_IH-C-48 (formerly TFC-ESHQ-S_IH-CD-35 REV C-2), Managing Vapor Control Zones.

Work Activity/Task:

1. The work activities are detailed in CLO-WO-07-1840, S-102 Remove Remaining Miscellaneous Equipment.
 - a. Work site prep and set-up.
 - b. Perform Radiological and IH surveys.
 - c. Removal and disposal of the HPM Sluice Water Hose.
 - d. Replace existing breather filter with new radial filter.
 - e. Install electrical and instrument pig tails at existing ENRAF.
 - f. Calibrate ENRAF.
 - g. Install camera at the existing Multi-Port Riser Adapter on riser # 5 and video inside of tank.
 - h. Complete work site restoration as required.
2. The VCZ can remain down posted for work order CLO-WO-08-0256, filter installation per procedure 5-VT-710 which will be performed in conjunction with CLO-WO-07-1840.
3. The work activities do not require waste-disturbing activities.

Comparable Activities:

1. Personal air sampling at S-Complex farms vapor sources showed no exposure measurements approaching 10% of the S-Complex Chemicals of Potential Concern. 7X100-JWJ-07-006. Results of Personal Air Sampling Conducted in S-Complex Tank Farms from November 2004-October 2006.
2. Review of air sampling and monitoring data up to 4/10/08 at S-102 showed no exposure measurements approaching 10% of the S-Complex Chemicals of Potential Concern.

Hazard Identification:

1. The hazardous gases and vapors potentially generated in the S-Complex Tank Farms waste tanks were identified in RPP-22491, Industrial Hygiene Chemical Vapor Technical Basis.
2. The hazardous gases and vapors potentially generated in the S-Complex Tank Farms waste tanks during non-waste disturbing activities were identified during S-Complex Chemicals of Potential Concern Characterization air sampling.

INTEROFFICE MEMORANDUM

Hanford Group, Inc.

7X100-JWJ-08-059

Date: February 19, 2008

To: Industrial Hygiene Technicians

From: J.W. Jabara, S7-75

Subject: AIR MONITORING AND AIR SAMPLING PLAN FOR S, SX AND SY-FARM WORK ACTIVITIES

This plan provides air monitoring and air sampling technical guidance to Industrial Hygiene Technicians (IHT) in support of work activities in S, SX and SY-Farms. This plan gives general guidance for air monitoring per the direction in TFC-ESHQ-S_IH-CD-35, Managing Vapor Control Zones, and to meet the air sampling expectations of TFC-PLN-34, Exposure Assessment Strategy. Task specific air monitoring or air sample plans can supersede this plan.

S, SX and SY-Farms Vapor Status:

VCZs in S, SX and SY-Farms have been established around sources where sampling results show vapors at concentrations greater than 50% of their OELs. These existing VCZs are identified on the S, SX and SY-Farms Tank Vapor Information Sheets (TVIS) and are located around breather filters, CAM cabinets on portable and fixed exhausters, pump pits and other potential tank vapor emission sources. Temporary VCZs may be established for specific tasks, e.g. when work planning has indicated that the work task could generate ammonia vapors greater than 12 ppm in the employee occupied work area (e.g. waste disturbing activities at an open tank riser without active tank ventilation).

Work inside a VCZ (permanent or temporary) will require the use of supplied air personal protective equipment unless a Tank Farm Chemical Exposure Hazard Analysis (TF-CEHA) has been developed for the work task. The air monitoring and air sampling technical guidance for the IHT for the task specific TF-CEHA are specified in this plan.

Air Monitoring Agents:

Air monitoring will be performed for chemicals of potential concern (COPCs) that were identified as $\geq 50\%$ of the occupational exposure limit (OEL) at the source during S, SX and SY-Farms characterization sampling (RPP-RPT-34976 Revision 0, S-Prefix Tank Farm Vapor Hazard Characterization Report, September 2007). Air monitoring will specifically target the COPCs with short term exposure limits (STEL). In S, SX and SY-Farms, ammonia is the specific COPC with an established STEL that has currently been identified $\geq 50\%$ of the OEL at sources.

COPC	OEL	Action Limit (50% of OEL)	Instrument
Ammonia	25 ppm	12 ppm	ITX (Other direct-reading instruments specific to ammonia may be used with IH approval)

Air Monitoring Conditions:

When opening access points to the tanks, air monitoring should be performed for ammonia to confirm areas are less than 50% of the OEL. If air monitoring levels reach 50% of the OEL per the table above, a temporary vapor control zone (VCZ) will be established at least five feet around the source. If air monitoring cannot be performed, a temporary VCZ will be established prior to opening the tank. Temporary VCZs can be removed after the opening has been closed and monitoring results confirm levels are below 50% of the OEL. Changes to monitoring or respiratory protection requirements inside existing VCZs, i.e. those identified on the S, SX and SY-Farms TVIS, will be made in accordance with TFC-ESHQ-S_IH-CD-35, Managing Vapor Control Zones.

Air Monitoring Protocol:

Area monitoring will be used to evaluate ammonia concentrations in a general area where employees and concentrations of a hazardous gas/vapor could potentially coexist. Area monitoring will be performed in the general area around the gas/vapor source and/or VCZ boundary.

The air monitoring instrument will be used in accordance with TF-OPS-IHT-004, Preparation and Field Use of iTX Multi Gas Monitor and iSP Motorized Sampling Pump and TF-OPS-IHT-007, A-0, Using Direct Reading Instruments. The maximum reading noted should be the measurement that is recorded on the TFIH IH DRI Monitoring Field Log. Monitoring results will be communicated to the appropriate Industrial Hygienist and CO Shift Manager.

Airborne Chemical Exposure Sampling:

Personal air samples collected for gases and vapors in S, SX and SY-Farms will be collected using the following guidelines. The responsible Industrial Hygienist (IH) can make modifications to these guidelines at any time and will specify the number and frequency of air samples.

Samples will be collected on both CH2M Hill and contractor employees working in the tank farms in accordance with TFC-PLN-34, Industrial Hygiene Exposure Assessment Strategy.

Table: Air sample media preparation for airborne chemical exposure air samples at S, SX and SY-Farms

Chemical	Sample Media	Sample Handling Instructions	Flow Rate * (ml/m)	Pump	Min-Max sample time** (min)	Min sample volume (liters)
Ammonia	CISA Tube SKC 226-29	Refrigerate	50-200	Gilian	30-480	1.5
Nitrosamines (NDMA)	Thermosorb	Refrigerate	2000	SKC	30-480	60

Chemical	Sample Media	Sample Handling Instructions	Flow Rate * (ml/m)	Pump	Min-Max sample time** (min)	Min sample volume (liters)
N ₂ O Badge	N ₂ O Badge (Assay X575AT)	Submit samples to Lab within (1) day of field sampling	N/A	N/A	30-480	N/A
* Use the higher flow rate if you anticipate the task to be sampled will last less than 5 hours (300 minutes).						
** Minimum sample time is 30 minutes – do not collect personal samples if task time in farm(s) will last less than 30 minutes and full-shift sampling cannot be conducted.						

Airborne Chemical Exposure Sampling Protocol:

1. The IHT will prepare the air sampling equipment as detailed above and collect the samples as per TFC ESHQ-S_IH-P-09, REV A-1 INDUSTRIAL HYGIENE PERSONAL/AREA EXPOSURE MONITORING.
2. The optimal flow rate for the Gilian pump is 200 ml/min (to maximize sample volume) but a lower flow rate (no lower than 50 ml/min) can be used if necessary.
3. The FWS and/or the shift supervisor will identify the person(s) who will be at greatest risk for chemical vapor exposure for the job. The IH Tech can request the FWS or assist in selecting the individual(s) to be sampled.
4. Provide one set of field blanks for each survey/job.
5. Collect the air samples for a full shift if possible. The sampler(s) can be taken off during lunch/breaks if necessary but it would be preferable to leave it on the employee. If the pump is taken off, stop it, record the time on the IH Field log, cap the sorbent tube, and secure the sample train in accordance with (IAW) TFC ESHQ-S_IH-P-09, REV A-1. Put the sample train back on the same employee when the break/lunch is finished. It is important to document on the IH field log whatever task the employee is doing as the sample is being collected.
6. The IHT will observe the sampled employees while they are in the field and monitor the security of the sample train if the employees must leave the TF for any reason.
7. The IHT will assist the sampled employees when the field task is completed by ensuring the sample train is secured when it is being radioactively cleared from the TF. The sample train should be allowed to continue to run during this time.

February 19, 2008

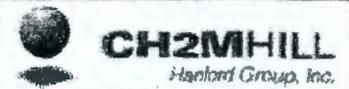
8. The IHT will check the sample train and sampled employee at least every 2 hrs and make arrangements with the employee to remove the sample train when the employee finishes the work shift.
9. If a full shift sample can not be collected, collect as long a sample as possible to represent the employee's exposure while performing the task at hand. Then interview the employee and ask what he/she is expecting to do for the remainder of the shift. Document the employee's reply as to his/her activities for the remainder of the work shift on the IH Field log.
10. Document all other field activities on the IH field log.

Data gathered from this monitoring and sampling will be used to update worker exposure assessment strategies as well as workplace vapor conditions as stated in the S, SX and SY-Farms Tank Vapor Information Sheet (TVIS).

JWJ:EAD

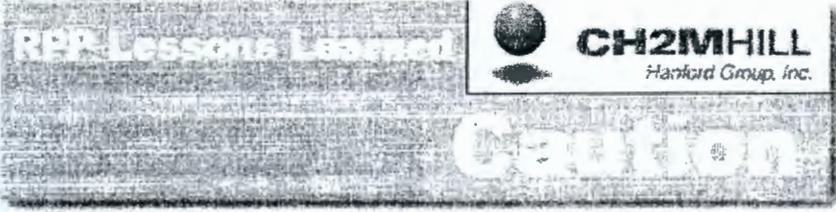
cc: D.F. Farler, S7-70
M.T. Hughey, S7-75
J.W. Jabara, S7-75
K.A. Roueche, S5-12
JWJ File/LB

River Protection Project



RPP Main | Emergency Security | Waste Services | SWE Personnel Readiness | Performance Assurance | Procedures and Training
General Information | Admin Resource Center | Communications | Human Resources | Operations | Safety - Health Programs
Engineering Resources | Business - Financial | Projects | Project Delivery | 222 S - Labs ATS ATL | Strat Plng and Proj Ctrls
Nuc. Safety and Licensing | Environmental Programs

RPP Lessons Learned



Stop Work When Conditions Change or Controls are not Being Followed

Bulletin Date: Jan 8 2008 12:00AM Bulletin Number: IB-08-003

Lessons Learned Statement: A leased piece of equipment was found to have an electrical fault. The workers, having basic electrical skills, fixed what they believed to be the problem, but missed others. The work should have been stopped when the workers discovered the fault.

Discussion: In early August, a leased liquid-helium dewar with an electric pressure builder was being positioned for use in a facility. The pressure builder was plugged into a GFCI outlet. The GFCI tripped when the unit was first plugged in and then again after several other attempts because of an internal fault in the electrical-control box. The workers disconnected the electrical-control box from the power source and then opened it to determine the source of the fault, which was found to be incorrect wiring. One worker then corrected the wiring with the intent to use the equipment; however, this was done without the appropriate authority-having-jurisdiction (AHJ) inspection that would have found other electrical issues with the equipment. Although the workers had basic knowledge of electrical systems, this activity was outside of the scope of work authorized in the work authorization document. Adjusting the wiring in the control box was also an issue because the Laboratory did not own the equipment; it was leased. Work was not stopped at the point when the authorized scope of work was exceeded. Subsequently, the leased dewar was taken out of service and an investigation followed.

CH2M HILL ENGINEERING CHANGE NOTICE

1a. ECN 725344 R 0

Page 1 of 13

DM FM TM

1b. Proj. ECN N/A - - R

2. Simple Modification <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		3. Design Inputs - For full ECNs, record information on the ECN-1 Form (not required for Simple Modifications)		4. Date 2/1/08	
5. Originator's Name, Organization, MSIN, & Phone No. GW Wilson, AREVA, H3-27, 376-1596		6. PrHA Number No. PrHA-00037 R - 0 <input type="checkbox"/> N/A	7. USQ Number No. TF - 08 - 0266 - DR - 1 <input type="checkbox"/> N/A	8. Related ECNs ECN-724952-R1 & ECN-724343-R0	
9. Title Replace Breather Filter with Radial Breather Filter		10. Bldg. / Facility No. 241S/241-S-102	11. Equipment / Component ID S102-WST-FLT-101	12. Approval Designator E	
13. Engineering Documents/Drawings to be Changed (Incl. Sheet & Rev. Nos.) See Block 18			14. Safety Designation <input type="checkbox"/> SC <input type="checkbox"/> SS <input checked="" type="checkbox"/> GS <input type="checkbox"/> N/A	15. Expedited/Off-Shift ECN? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
16a. Work Package Number CLO-WO-07-1840	16b. Modification Work Completed <i>[Signature]</i> APR 28 2008 STA 3 4.2808. N/A 18 Responsible Engineer / Date	16c. Restored to Original Status (TM)	17. Fabrication Support ECN? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		

18. Description of the Change (Use ECN Continuation pages as needed)
Engineering Document/Drawings to be Changed (continued from Block 13)

- H-2-73182 Sh 1, R10
- H-14-010633 Sh 1, R5
- H-14-106151 Sh 2, R2
- H-14-106151 Sh 5, R3

This ECN replaces the breather filter with a radial breather filter assembly.

See page 3 for continuation of description of change

19. Justification of the Change (Use ECN Continuation pages as needed) Engineering Rework <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		20. ECN Category	
The breather filter is being replaced as part of the 241-S-102 spill recovery effort. A technical evaluation, TE-08-013, provides the justification for using a radial filter assembly on 241-S-102.		<input type="checkbox"/> Direct Revision	
		<input checked="" type="checkbox"/> Supplemental	
		<input type="checkbox"/> Void/Cancel	
		ECN Type	
		<input type="checkbox"/> Supersedure	
		<input type="checkbox"/> Revision	

21. Distribution			
Name	MSIN	Name	MSIN
DG Baide	S7-24	CE Hanson	H3-27
JF Bores	S7-07	MR Landon	S7-27
JS Conrad	S7-03	RE Mendoza	H3-27
SD Doss	S7-03	CEES Project Files	B8-12
TR Farris	S7-27	RL Matthews	S7-83
GJ Gauck	S7-27	RP Tucker	S7-83
KJ Hull	S7-27		

Release Stamp

DATE: APR 09 2008

STA: 4 HANFORD RELEASE ID: 8

APP 29 2008
 18
 578 3

CH2M HILL ENGINEERING CHANGE NOTICE

Page 2 of 15

DM FM TM

1a. ECN 725344 R 0

1b. Proj. ECN N/A - - R

22. Revisions Planned (Include a brief description of the contents of each revision)
 None

Note: All revisions shall have the approvals of the affected organizations as identified in block 12 "Approval Designator," on page 1 of this ECN.

23. Commercial Grade Item Dedication Numbers (associated with this design change)
 N/A

24. Engineering Data Transmittal Numbers (associated with this design change, e.g., new drawings, new documents)
 N/A

25. Other Non Engineering (not in HDCS) documents that need to be modified due to this change

Type of Document	Document Number	Update Completed On	Responsible Engineer (print/sign and date)
Alarm Response Procedure	N/A	N/A	N/A
Operations Procedure	N/A	N/A	N/A
Maintenance Procedure	TF-OR-ST-Q	4/28/08	6/28/08 4.28.08
Type of Document	Document Number	Type of Document	Document Number
Env. Spec.	RPP-16922 (pg 56)	N/A	N/A
Maintenance Proc.	3-VB-1575 3-VB-1575 4.2.08		
PM	WT-03705 (old BFAT)	} THESE ITEMS MUST BE COMPLETED IN ORDER TO SIGN BLOCK #160 AS WORK COMPLETE.	4/28/08 6/28/08 4.28.08
PM	WT-06789 (old repl)		4/28/08 6/28/08 4.28.08
PM	WT-106183 (new yearly repl)		4/28/08 6/28/08 4.28.08

26. Field Change Notice(s) Used?
 Yes No
 If Yes, Record Information on the ECN-2 Form, attach form(s), include a description of the interim resolution on ECN Page 1, block 18, and identify permanent changes.

NOTE: ECNs are required to record and approve all FCNs issued. If the FCNs have not changed the original design media then they are just incorporated into the design media via an ECN. If the FCN did change the original design media then the ECN will include the necessary engineering changes to the original design media.

27. Design Verification Required?
 Yes No
 If Yes, as a minimum attach the one page checklist from TFC-ENG-DESIGN-P-17.

28. Approvals

Facility/Project Signatures		Date	A/E Signatures		Date
Resp. Engineer	GA Gauck	3-17-08	Originator/Design Agent	GW Wilson R/L Lydon	3/13/08
Resp. Manager	DG Balde	3-18-08	Professional Engineer		
Quality Assurance			Project Engineer		
IS&H Engineer			Quality Assurance		
NS&L Engineer			Safety		
Environ. Engineer	JS Conrad	2/17/08	Designer		
Engineering Checker	TR Farris	3-14-08	Environ. Engineer		
Other	CJ KEMP	3-20-08	Other	CEES	3/4/08
Other			Other		
Other			DEPARTMENT OF ENERGY / OFFICE OF RIVER PROTECTION		
Other			Signature or a Control Number that tracks the Approval Signature		
Other			ADDITIONAL SIGNATURES		
Other					
Other					

**CH2M HILL ENGINEERING CHANGE NOTICE
CONTINUATION SHEET**

1a. ECN 725344 R 0

Page 3 of 15

1b. Proj. ECN N/A - - R

Document/Drawing No. N/A

Sheet N/A

Revision N/A

Description of Change (Continued from page 1)

PROBLEM: The current breather filter with a "G1" housing that is installed on 241-S-102, Riser 1, needs to be replaced as part of the S-102 spill recovery.

ANALYSIS: Per RPP-10906 "Passive Ventilation Breather Assembly Structural Analysis" the loads imposed on a riser from a 4 x 4 x 4 breather filter assembly with a G1 housing for the required seismic and wind loads are:

Dead Load - 480 lbs. Dead load moment - 8450 lbs. Seismic Shear - 216 lbs. Seismic moment - 8125 in*lbs. Seismic Torsion - 3, 805 in*lbs.

Per RPP-CALC-31457 "S Farm 4" Riser with Anchors Analysis" the maximum allowable loads for Riser 1 are:

Dead Load - 10500 lbs. Moment - 40,000 in*lbs. Lateral Load - 960 lbs.

Since the radial breather filter assembly is smaller, lighter, shorter, and has less wind surface area than the breather filter assembly with a G1 housing the loads imposed on a riser will be significantly less than the loads determined in RPP-10960. Since a radial breather filter is bounded by the loads and joint connections in the previous analysis, 241-S-102 Riser 1 is adequate to support the loads imposed by a 4 x 4 x 4 radial breather filter assembly.

The removal of the oil seal loop has been addressed in TE-06-011 "Technical Evaluation of Breather Filter Seal Loops". The installation of a radial-type breather filter on tank S-102 has been evaluated in TE-08-013, "Technical Evaluation for the S-102 Radial Breather Filter Installation".

SOLUTION: The breather filter will be replaced with a radial breather filter without a seal loop by changing the following drawings:

H-2-73182 Sh 1: Change the Riser and Nozzle Schedule on the drawing to show radial breather filter installed in Riser 1 as shown on page 4 of this ECN.

H-14-010633 Sh 1: Change 241-S-102 riser schedule on the drawing to show radial breather filter installed in Riser 1 as shown on page 5 of this ECN.

H-14-106151 Sh 2: Change the Civil Site Plan to pictorially depict a radial breather filter on Riser 1 as shown on pages 6 and 7 of this ECN.

H-14-106151 Sh 5: Change the Civil Site Plan to pictorially depict a radial breather filter on Riser 1 as shown on page 8 and 9 of this ECN.

WORK INSTRUCTIONS: See specific work package for work instructions.

POST MAINTENANCE TESTING: An AG-1 checklist will be completed after installation.

CH2M HILL ENGINEERING CHANGE NOTICE
CONTINUATION SHEET

1a. ECN-725344-R0

Page 4 of 13

1b. Proj. ECN W- - R

Document/Drawing No. H-2-73182 Sheet 1 Revision 10

WAS: RISER SCHEDULE, ZONE F1-F3
OUTSTANDING ECNS DO NOT AFFECT THIS MODIFICATION.

RISER AND NOZZLE SCHEDULE

RISER NO.	SIZE	IDENTIFICATION	REFERENCES AND COMMENTS
S102-WST-RISER-001	4"	IN-TANK CAMERA ASSEMBLY "B"	H-14-105793, SH 1, ITEM 16

IS: REVISE RISER SCHEDULE AS SHOWN:

Note: The configuration of camera's are no longer being controlled by drawings since they may be moved from riser to riser as required.

RISER AND NOZZLE SCHEDULE

RISER NO.	SIZE	IDENTIFICATION	REFERENCES AND COMMENTS
S102-WST-RISER-001	4"	RADIAL BREATHER FILTER ON WYE ADAP.	H-2-90718

CH2M HILL ENGINEERING CHANGE NOTICE
CONTINUATION SHEET

1a. ECN-725344-R0

Page 5 of 13

1b. Proj. ECN W- - R

Document/Drawing No. H-14-010633 Sheet 1 Revision 5

WAS: 241-S-102 RISER SCHEDULE, ZONE E1-E2
OUTSTANDING ECNS DO NOT AFFECT THIS MODIFICATION

TANK 241-S-102			ISOLATION DRAWING H-2-73182	
NEW EIN	OLD ID	SIZE	FUNCTION (REF ONLY)	ELEV (FEET)
RISER-001	R-1	4"	BREATHER FILTER ON "Y" ADAPTER	665.02
RISER-002	R-2	4"	SPARE	665.05
RISER-003	R-3	4"	THERMOCOUPLE PROBE	665.10

IS: REVISE RISER SCHEDULE AS SHOWN:

TANK 241-S-102			ISOLATION DRAWING H-2-73182	
NEW EIN	OLD ID	SIZE	FUNCTION (REF ONLY)	ELEV (FEET)
RISER-001	R-1	4"	RADIAL BREATHER FILTER ON "Y" ADAPTER	665.02
RISER-002	R-2	4"	SPARE	665.05
RISER-003	R-3	4"	THERMOCOUPLE PROBE	665.10

CH2M HILL ENGINEERING CHANGE NOTICE
CONTINUATION SHEET

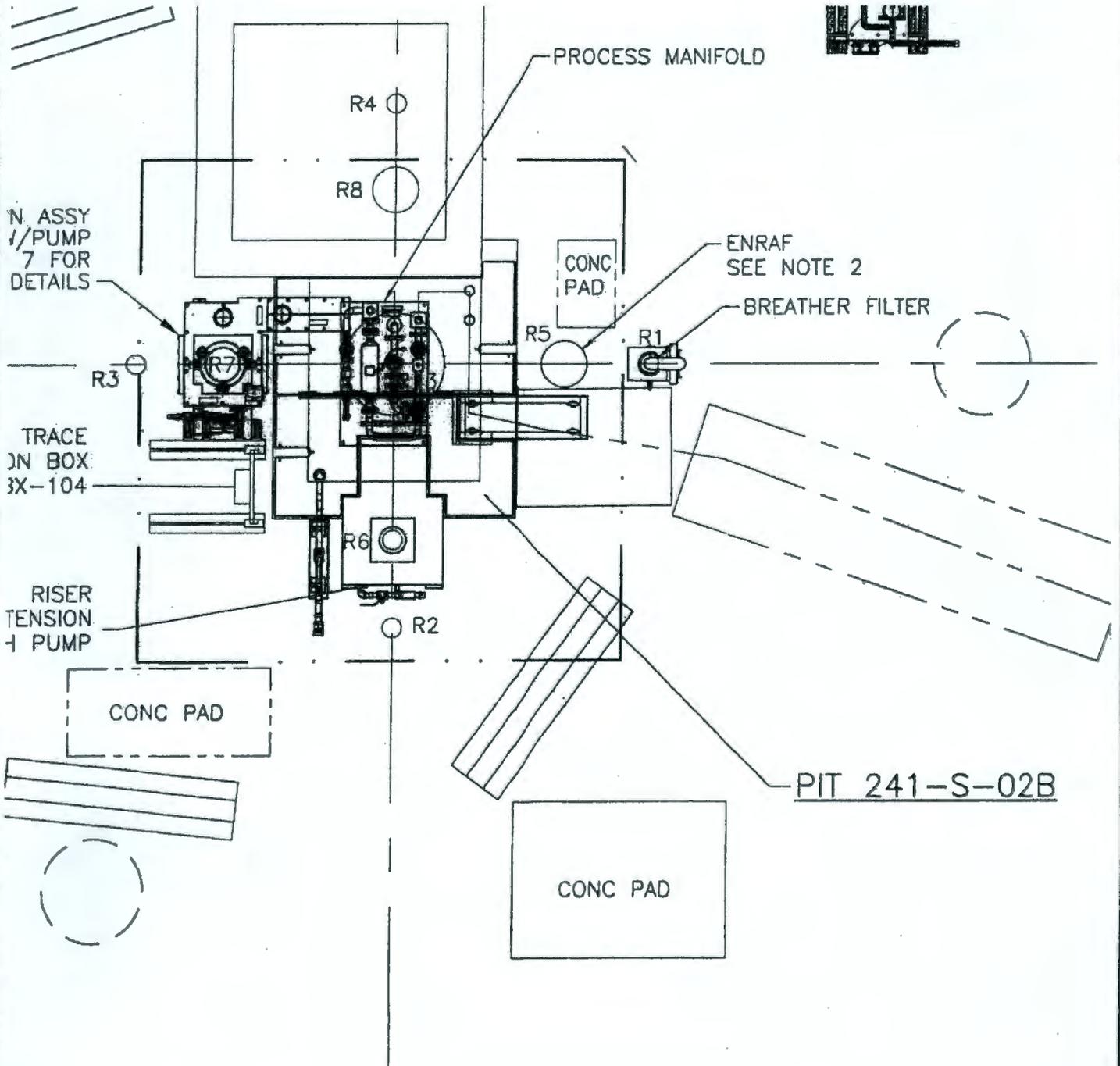
1a. ECN-725344-R0

Page 6 of 13

1b. Proj. ECN W- - R

Document/Drawing No. H-14-106151 Sheet 2 Revision 2

WAS: ZONE C5-D6, PER ECN-724952-R1, OTHER
OUTSTANDING ECNS DO NOT AFFECT THIS MODIFICATION



CH2M HILL ENGINEERING CHANGE NOTICE
CONTINUATION SHEET

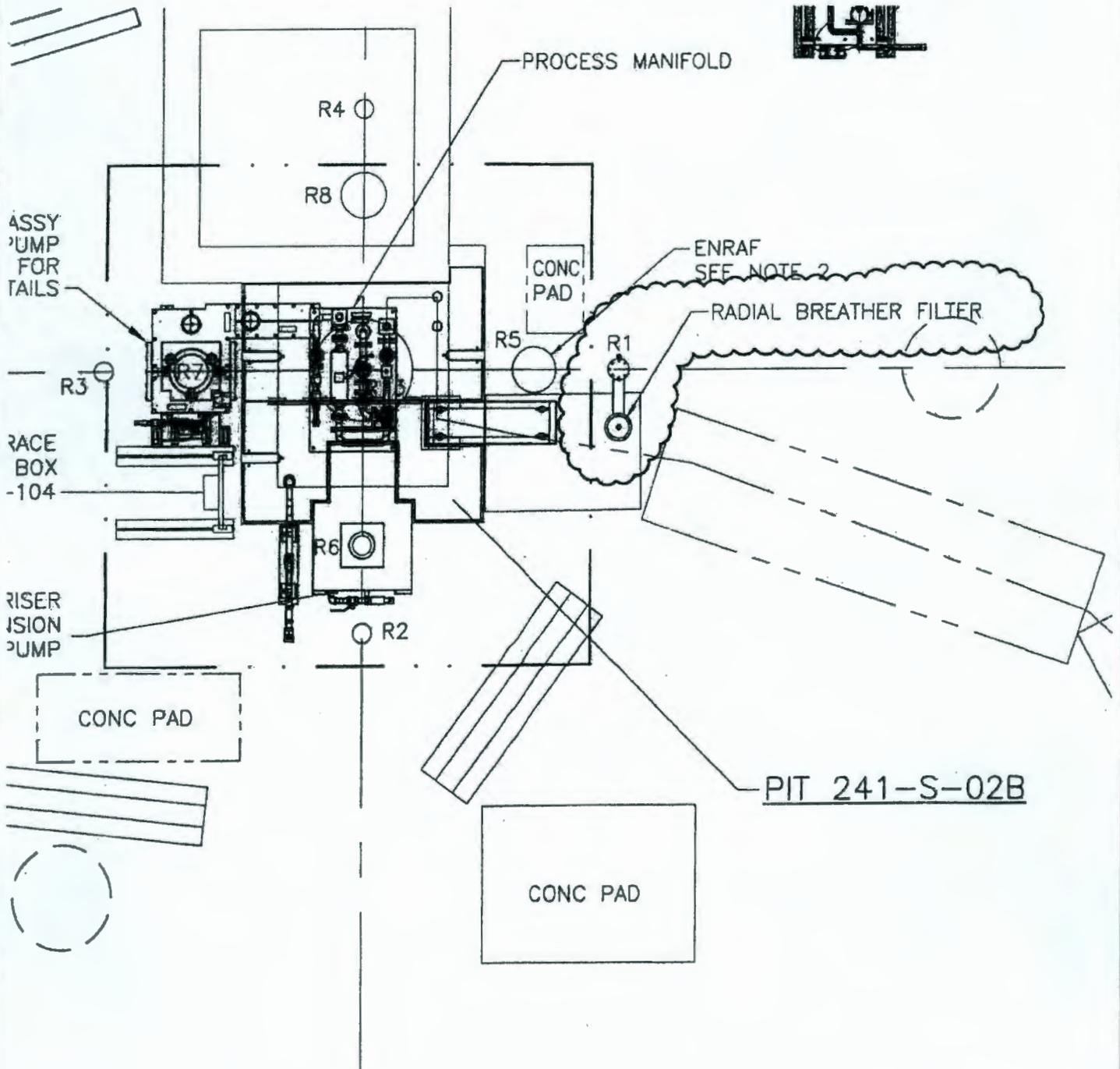
1a. ECN-725344-R0

Page 7 of 13

1b. Proj. ECN W- - R

Document/Drawing No. H-14-106151 Sheet 2 Revision 2

IS: REVISE DRAWING TO PICTORIALLY DEPICT RADIAL BREATHER FILTER
INSTALLED IN RISER 1 AS SHOWN:



CH2M HILL ENGINEERING CHANGE NOTICE
CONTINUATION SHEET

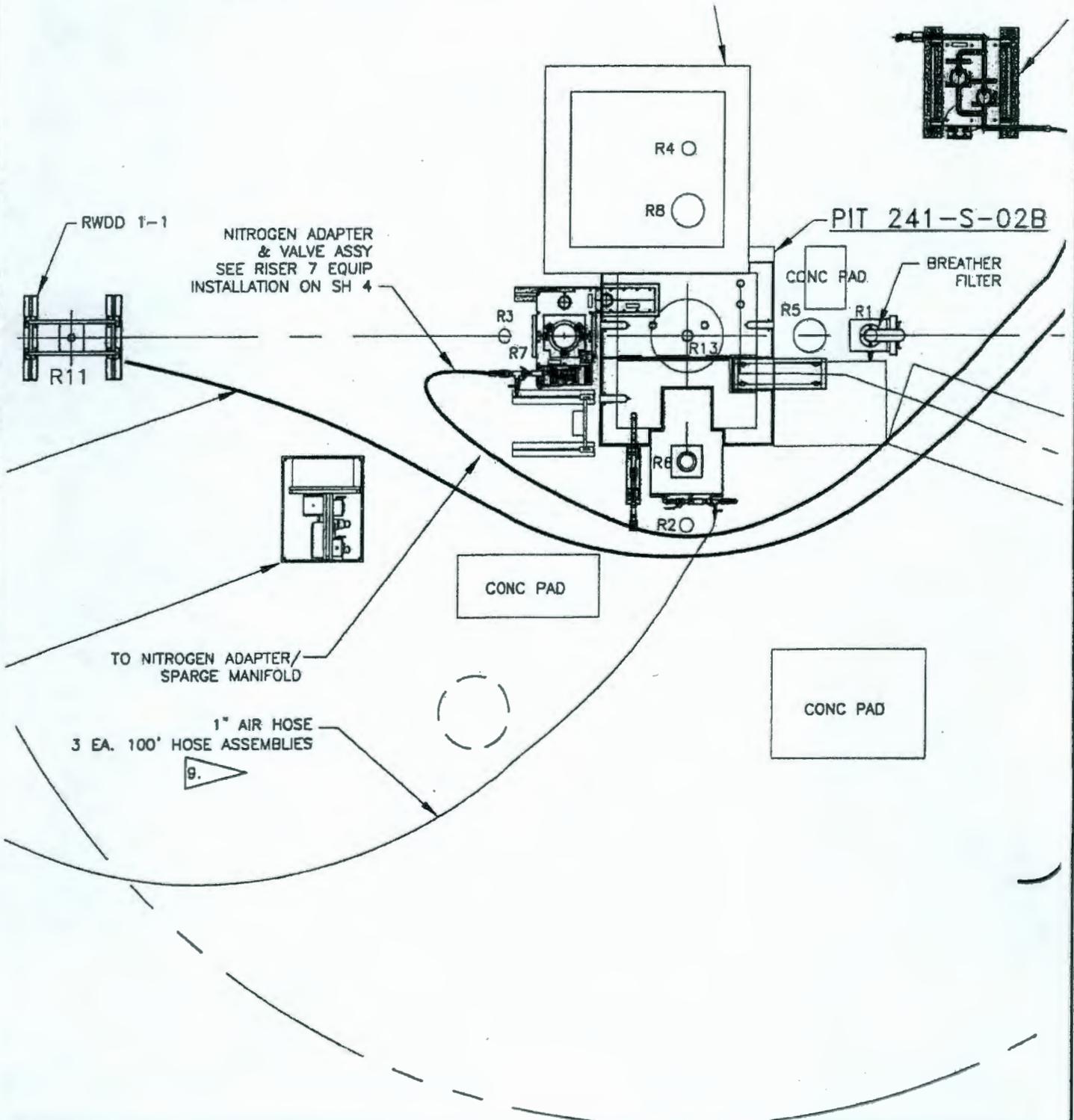
1a. ECN-725344-R0

Page 8 of 13

1b. Proj. ECN W- - R

Document/Drawing No. H-14-106151 Sheet 5 Revision 3

WAS: ZONE C5-D6,
OUTSTANDING ECNS DO NOT AFFECT THIS MODIFICATION



CH2M HILL ENGINEERING CHANGE NOTICE
CONTINUATION SHEET

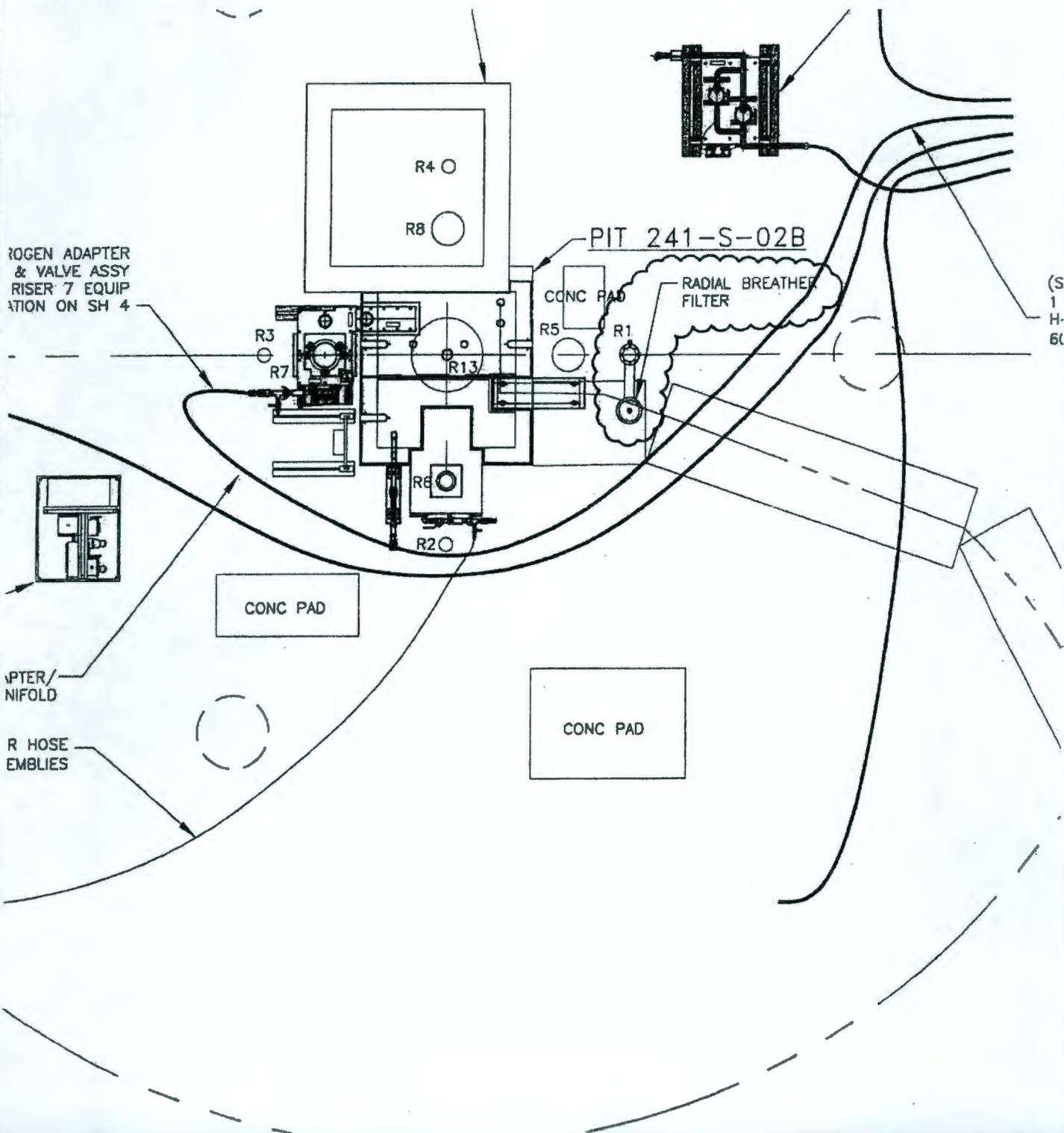
1a. ECN-725344-R0

Page 9 of 13

1b. Proj. ECN W- - R

Document/Drawing No. H-14-106151 Sheet 5 Revision 3

IS: REVISE DRAWING TO PICTORIALLY DEPICT RADIAL BREATHER FILTER
INSTALLED IN RISER 1 AS SHOWN:



CH2M HILL ENGINEERING CHANGE NOTICE

1a. ECN 725475 R 0

Page 1 of 11

DM FM TM

1b. Proj. ECN N/A - R

2. Simple Modification <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		3. Design Inputs – For full ECNs, record information on the ECN-1 Form (not required for Simple Modifications)		4. Date 2/27/08	
5. Originator's Name, Organization, MSIN, & Phone No. RW Lysher, AFS, H3-27, 372-8783		6. PrHA Number No. 00034 R - 1 <input type="checkbox"/> N/A	7. USQ Number No. TF - 08 - 0230 - D R - 1 <input type="checkbox"/> N/A	8. Related ECNs ECN-724065-R1 ECN-724096-R1 ECN-724956-R1	
9. Title ENRAF ELECTRICAL INSTALLATION 241-S-102		10. Bldg. / Facility No. 241S/241-S-102	11. Equipment / Component ID S102-WST-LIT-101 (formerly WST-LIT-3302A)	12. Approval Designator None	
13. Engineering Documents/Drawings to be Changed (Incl. Sheet & Rev. Nos.) See Block 18			14. Safety Designation <input type="checkbox"/> SC <input type="checkbox"/> SS <input checked="" type="checkbox"/> GS <input type="checkbox"/> N/A	15. Expedited/Off-Shift ECN? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
16a. Work Package Number CLO-WO-07-1840	16b. Modification Work Completed Responsible Engineer / Date	16c. Restored to Original Status (TM) N/A Responsible Engineer / Date		17. Fabrication Support ECN? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	

18. Description of the Change (Use ECN Continuation pages as needed)
 Engineering Documents to be Changed (from Block 13)

H-2-817634 Sht. 6, Rev. 28 H-14-020633 Sht. 1, Rev. 11

Problem: The ENRAF that is currently installed on S-102 Riser 5 needs to be operable as part of the Recovery effort. The ENRAF requires electrical power so an electrical whip will need to be installed to allow for connection to an electrical extension cord. All permanent electrical connections, wire runs and conduit runs were capped, determined or removed under guidance of ECN-724956-R1 and as such the electrical power supply to the ENRAF will require rework. The Pressure transmitter was removed as part of the ECN to remove the ENRAF electrical stand but was not shown.

FOR INFORMATION ONLY: ECN-724096-R2 will correct the ENRAF Reference Level which was documented and released by ECN-724096-R1.

See page 3 for continuation.

19. Justification of the Change (Use ECN Continuation pages as needed) Engineering Rework <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Field modifications are required to complete recovery activities at the spill site at the 02B pit of S-102. The ENRAF instrument is required to be operational to continue to monitor tank liquid levels upon completion of recovery efforts. The removal of the pressure transmitter was not shown correctly in a prior ECN and will be corrected by this ECN.		20. ECN Category <input type="checkbox"/> Direct Revision <input checked="" type="checkbox"/> Supplemental <input type="checkbox"/> Void/Cancel ECN Type <input type="checkbox"/> Supersedure <input type="checkbox"/> Revision	
--	--	--	--

21. Distribution			
Name	MSIN	Name	MSIN
DG Baide	S7-24	GL Rensink	S7-92
JS Boettger	S7-24	RE Mendoza	H3-27
JF Bores	S7-07	CEES Project Files	B8-17
MA Fish	S7-24	GJ Coleman	S7-24
KJ Hull	S7-24	MR Landon	S7-24
DW Lysher	H3-27	DA Barnes	R2-58

Release Stamp



DATE: APR 16 2008
 STA. 3
 WAINFORD RELEASE
 ID: 18

CH2M HILL ENGINEERING CHANGE NOTICE

1a. ECN 725475 R 0

Page 2 of 11

DM FM TM

1b. Proj. ECN N/A - - R

22. Revisions Planned (Include a brief description of the contents of each revision)
N/A

Note: All revisions shall have the approvals of the affected organizations as identified in block 12 "Approval Designator," on page 1 of this ECN.

23. Commercial Grade Item Dedication Numbers (associated with this design change)
N/A

24. Engineering Data Transmittal Numbers (associated with this design change, e.g., new drawings, new documents)
N/A

25. Other Non Engineering (not in HDCS) documents that need to be modified due to this change

Type of Document	Document Number	Update Completed On	Responsible Engineer (print/sign and date)
Alarm Response Procedure	N/A		
Operations Procedure	N/A		
Maintenance Procedure	N/A		
Type of Document	Document Number	Type of Document	Document Number
PM Maintenance	WT-03653	N/A	N/A
Supporting Document	WHC-SD-WM-CN-078 (page A-97)		

26. Field Change Notice(s) Used?
 Yes No
If Yes, Record Information on the ECN-2 Form, attach form(s), include a description of the interim resolution on ECN Page 1, block 18, and identify permanent changes.

NOTE: ECNs are required to record and approve all FCNs issued. If the FCNs have not changed the original design media then they are just incorporated into the design media via an ECN. If the FCN did change the original design media then the ECN will include the necessary engineering changes to the original design media.

27. Design Verification Required?
 Yes No
If Yes, as a minimum attach the one page checklist from TFC-ENG-DESIGN-P-17.

28. Approvals

Facility/Project Signatures	Date	A/E Signatures	Date
Resp. Engineer KJ Hull <i>[Signature]</i>	4/15/08	Originator/Design Agent RE Mendoza <i>[Signature]</i>	3-27-08
Resp. Manager DG Baide <i>[Signature]</i>	4-15-08	Professional Engineer	
Quality Assurance		Project Engineer	
IS&H Engineer		Quality Assurance	
NS&L Engineer		Safety	
Environ. Engineer		Designer	
Engineering Checker GE Coleman <i>[Signature]</i>	3/31/08	Environ. Engineer	
Other		Other	
Other		Other CEES <i>[Signature]</i>	3/27/08
Other		DEPARTMENT OF ENERGY / OFFICE OF RIVER PROTECTION	
Other		Signature or a Control Number that tracks the Approval Signature	
Other			
Other		ADDITIONAL SIGNATURES	
Other			
Other			

**CH2M HILL ENGINEERING CHANGE NOTICE
CONTINUATION SHEET**

1a. ECN 725475 R 0

Page 3 of 11

1b. Proj. ECN N/A - - R

Document/Drawing No. N/A

Sheet N/A

Revision N/A

Block 18. Description of the Change Cont'd:

Solution: Install electrical power cord and plug.

Analysis: No analysis is required since only electrical field power is being reapplied to the gauge.

The specific drawings that will be modified are as follows:

For H-2-817634 Sht 6, R28 - Revise West Area Riser Schedule for S-102 Electrical Installation number as shown on page 5 of this ECN.

For H-14-020633 Sht 1, R11 - Revise drawing to show removal of pressure transmitter on ENRAF as shown on pages 6 & 7 of this ECN.

**CH2M HILL ENGINEERING CHANGE NOTICE
CONTINUATION SHEET**

1a. ECN 725475 R 0

Page 4 of 11

1b. Proj. ECN N/A - - R

Document/Drawing No. N/A

Sheet N/A

Revision N/A

"Installation Instructions – Not to be Incorporated"

Installation Instructions:

The following installation steps and their order are for work package guidance only and may be modified and completed in sections as required. See work package for the actual work directions.

1. If new ENRAF is to be used, dispose or store ENRAF from Riser 5 per work instructions.
2. Install ENRAF on 241-S-102 Riser 5 as shown on assembly H-2-817634 Sht 1 Rev 20, Item 10. Ball valve should be positioned with handle out as shown. Desirable position of the ENRAF is with the LCD display face to north to aid in field reading during sunny conditions. Torque all flange bolts per H-2-817634.
3. Install new electrical cord to the ENRAF per H-2-815467-280.
4. Perform NEC electrical inspection (as applicable).

Testing:

The following testing steps and their order are for work package guidance only and may be modified and completed in sections as required. Testing will follow the completion of the mechanical / electrical installation of the ENRAF on 241-S-102 Riser 5. See work package for the actual work directions.

- a) Perform electrical and mechanical checks of the ENRAF assembly as necessary to verify the equipment installed / modified by this ECN operates acceptably.
- b) Perform ENRAF Initial Installation and Operational Check - Maintenance Procedure 5-LCD-125 (as applicable).
- c) Perform ENRAF Weight Check Calibration – PM WT-03653 Maintenance Procedure 5-LCD-300 (as applicable).
- d) Additional test requirements may be specified in the project test report or similar document (as applicable)

Operational acceptance of the S-102 retrieval system associated with this installation is contingent on the satisfactory conclusion of these specified tests.

CH2M HILL ENGINEERING CHANGE NOTICE
CONTINUATION SHEET

1a. ECN-725475 R 0

Page 5 of 11

1b. Proj. ECN N/A - - R

Document/Drawing No. H-2-817634

Sheet 6

Revision 28

WAS:

WEST AREA RISER SCHEDULE

TANK NO.	RISER NO.	SIZE	ASSY NO.	BALL VALVE	REF LEVEL	ELEC INST (H-2-815467)
241-S-101	3	4"	1	20	555.00	-030
241-S-102	5	12"	50	48	556.06	-060
241-S-103	3	4"	1	20	556.72	-010
241-S-104	5	12"	50	20	555.25	-140
241-S-105	3	4"	1	48	557.02	-030
241-S-106	3	4"	1	20	556.60	-010

IS:

WEST AREA RISER SCHEDULE

TANK NO.	RISER NO.	SIZE	ASSY NO.	BALL VALVE	REF LEVEL	ELEC INST (H-2-815467)
241-S-101	3	4"	1	20	555.00	-030
241-S-102	5	12"	50	20	556.06	-280
241-S-103	3	4"	1	20	556.72	-010
241-S-104	5	12"	50	20	555.25	-140
241-S-105	3	4"	1	48	557.02	-030
241-S-106	3	4"	1	20	556.60	-010

CH2M HILL ENGINEERING CHANGE NOTICE
CONTINUATION SHEET

1a. ECN-725475 R 0

Page 6 of 11

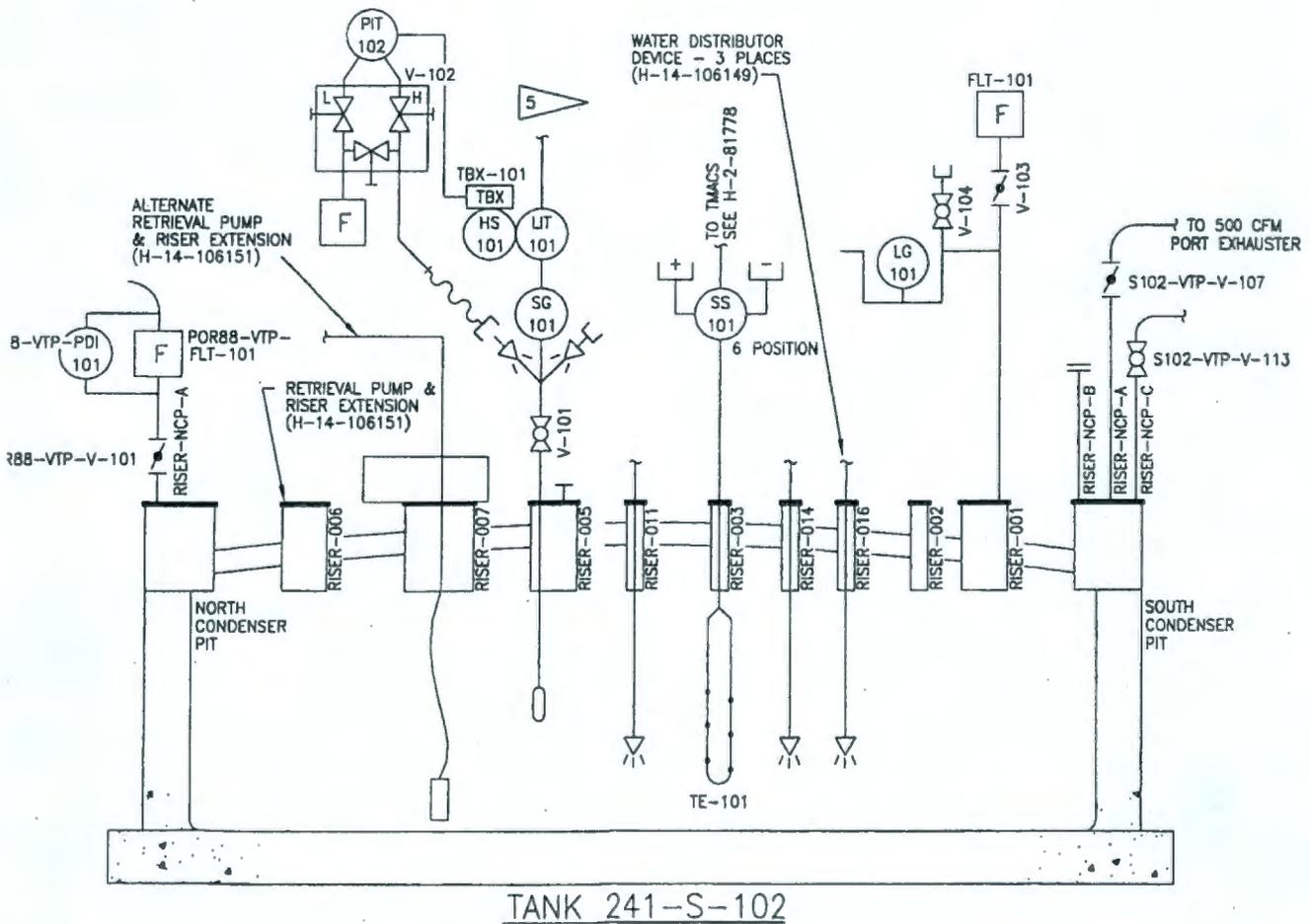
1b. Proj. ECN N/A - - R

Document/Drawing No. H-14-020633

Sheet 1

Revision 11

WAS: INCORPORATES ECN-724065-R1 & 724956-R1



CH2M HILL ENGINEERING CHANGE NOTICE
CONTINUATION SHEET

1a. ECN-725475 R 0

Page 7 of 11

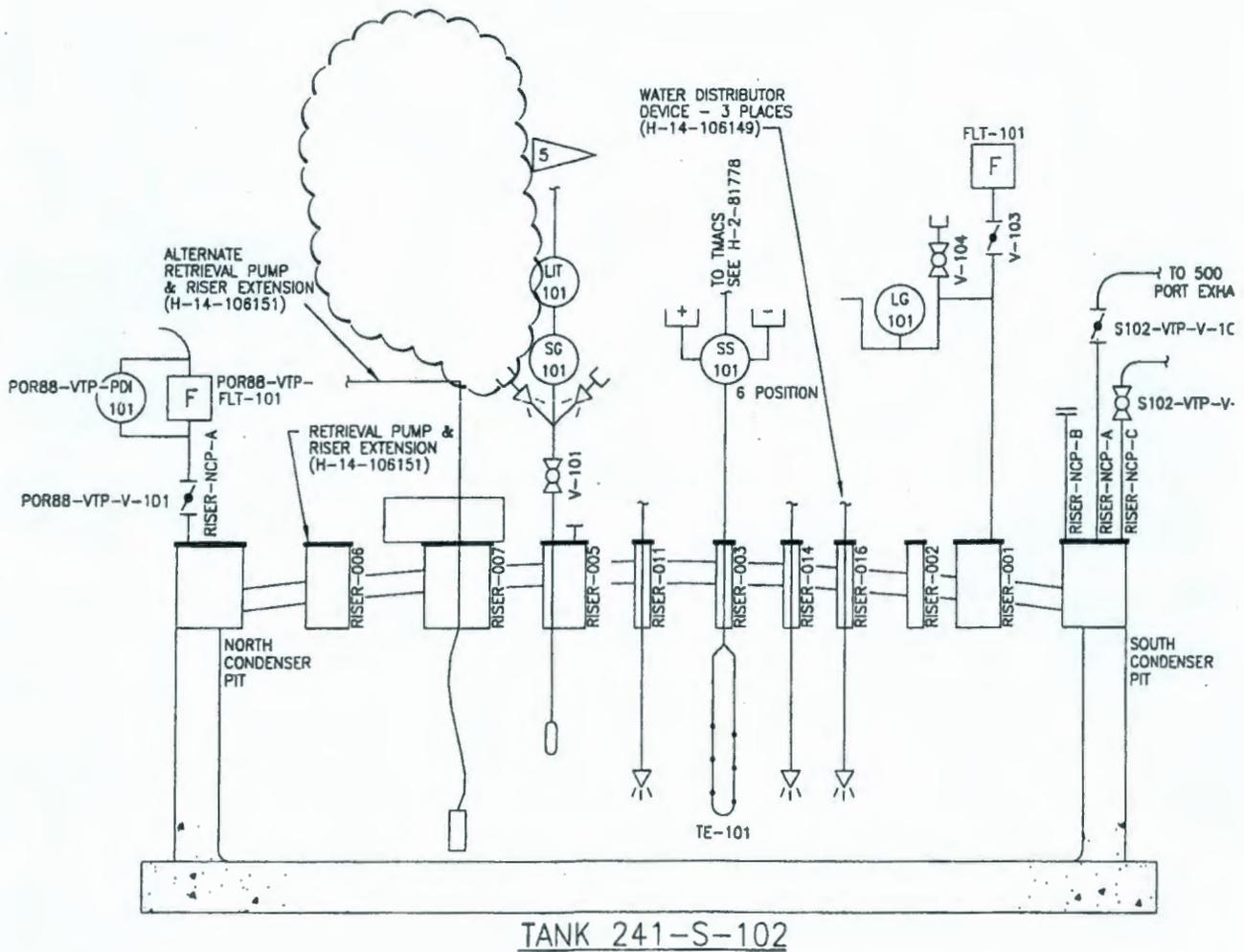
1b. Proj. ECN N/A - - R

Document/Drawing No. H-14-020633

Sheet 1

Revision 11

IS: INCORPORATES ECN-724065-R1 & 724956-R1



PROCESS HAZARDS ANALYSIS SCREENING

1. Title: ENRAF Electrical Installation 241-S-102

2. PrHA-00034 R-1

3. Project Name/No.:

Area: East West

Facility: SST DST 242-A Evaporator ATS/222-S Lab Other (specify):

4. Description:

These ECNs provide the details necessary to show the changes to the liquid level instrument (ENRAF) located at Riser 5 in support of completion of Recovery operations. This activity reestablishes electrical power to the ENRAF gauge. ECN-725475-R0 revises the drawings to perform the field modification. ECN-724096-R1 was issued that revised the ENRAF reference level in WHC-SD-WM-CN-078. A revised ECN-724096-R2 will be issued to change the Reference Level Calculation back to its prior reference.

5. Associated Document Number(s):

ECN-725475-R0 and ECN-724096-R2

6. Type of Activity: (see block 11 for determination and justification)

- Specified Activity that requires a PrHA.
- Major Project that requires a PrHA.
- Major Change that requires evaluation of the need for a PrHA.
- Minor Change that does not require a PrHA.

7. Selected PrHA Technique: (see block 12 for additional details and justification)

- Full HAZOP
- Delta HAZOP
- What-if/Checklist
- Other PrHA Technique
- PrHA is not required

8. Engineering Approvals

Title	Printed Name	Signature	Date
Responsible Engineer	KJ Hull	<i>KJ Hull</i>	4/15/08
Responsible Manager/Director	DG Baide	<i>DG Baide</i>	4-15-08

Release Stamp

9. PrHA Technique Approvals

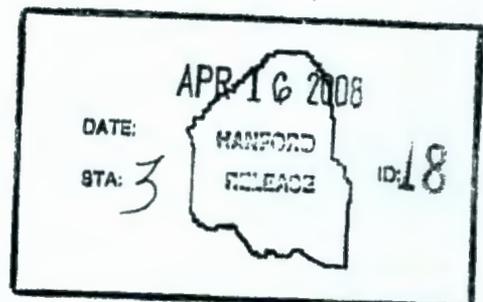
PrHA Team Lead	
Process Analysis Director	

10. Clearance

Clearance Review	<i>BARBARA WOLSKY</i> <i>Barbara Wolsky</i>	4/16/08
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Cleared For Public Release Yes No
 Restricted Use? Yes No

Restriction Type:



PROCESS HAZARDS ANALYSIS SCREENING

PrHA - 00034 R1
Page 2 of 4

11. PrHA Screening Questions: (see instructions)

1. Is this a Specified Activity?

- a. Is the activity a current SST Retrieval Project (C-104, C-108, C-109, C-110, or S-102)? Yes No
- b. Is the activity an in-process SST or DST ventilation installation or start-up (AN/AW New Ventilation System, C-108/C-109/C-110 Ventilation System)? Yes No
- c. Is the activity an in-process DST transfer pump installation or start-up (AN-101 and AZ-102 pumps)? Yes No
- d. Is the activity the first planned DST to DST transfer after implementation of TFC-MD-054 (241-AP-101 to tank 241-AW-102 transfer)? Yes No
- e. Has TFC management determined that a PrHA of this activity or change be conducted? Yes No

2. Is this a Major Project?

- a. Is this a major project (e.g., SST retrieval or tank farm pre-treatment) that involves the storage, handling, or processing of radioactive and other hazardous materials including the transfer or physical/chemical manipulation of tank farm waste? Yes No

Justification for question answered "No": This activity reestablishes electrical power to existing components. Modification of components will not impact the storage, handling, or processing of radioactive or other hazardous materials.

- b. Is this a major project that does not involve radioactive or hazardous material but whose failure could prevent the safe operation of existing systems, structures, or components used in the storage, handling, or processing of radioactive and other hazardous materials? Yes No

Justification for question answered "No": This activity reestablishes electrical power to existing components. Modification of components will not impact the storage, handling, or processing of radioactive or other hazardous materials.

3. Is this a Major Change?

- a. Is this a change in an existing TFC facility, project, or operation that alters the originally planned process, equipment, equipment size/capacity, equipment specifications or design basis, piping, process configuration, sequence of operations, process controls, duration, facility or equipment layout, or location, involving the storage, handling, or processing of radioactive or other hazardous materials? Yes No

Justification for question answered "No": This activity reestablishes electrical power to existing components. Modification of components will not impact the storage, handling, or processing of radioactive or other hazardous materials.

- b. Is this a change in an existing TFC facility, project, or operation that adds or modifies equipment such that failure of the added/changed item could prevent the safe operation of existing systems, structures, or components used in the storage, handling, or processing of radioactive and other hazardous materials? Yes No

Justification for question answered "No": This activity reestablishes electrical power to existing components. Modification of components will not impact safe operation of the facility.

- c. Is this a change in an existing TFC facility, project, or operation that results in different or increased quantities of radioactive and other hazardous materials in the process or operation, such as changes in tank waste or process chemicals that are outside the minimum and maximum ranges previously evaluated by a PrHA? Yes No

Justification for question answered "No": This activity reestablishes electrical power to existing components. Modification of components will not change material quantities or process chemicals.

- d. Is this a change in an existing TFC facility, project, or operation involving the storage, handling, or processing of radioactive or other hazardous materials, that results in different operating parameters that are outside the minimum and maximum ranges previously evaluated by a

PROCESS HAZARDS ANALYSIS SCREENING

PrHA-00034 R1
Page 3 of 4

PrHA?

Yes No

Justification for question answered "No": This activity reestablishes electrical power to existing components. Modification of components will not change operating parameters.

- e. Is this a change in an existing TFC facility, project, or operation involving the storage, handling, or processing of radioactive or other hazardous materials that impacts transfer pump type, pump performance, pump flow direction, pump location, pressure, temperature, chemistry of flush, dilution, mixing, agitation, purging, sparging, sluicing, water lancing, or other waste impacting factors?

Yes No

Justification for question answered "No": This activity reestablishes electrical power to existing components. No operating process parameters will be affected.

- f. Is this a change in a TFC facility or operation that adds or modifies energy source(s) that could inadvertently interact with the tank farm waste such as different or increased combustibles, flammables, compressed gases, steam sources, or reactive chemicals?

Yes No

Justification for question answered "No": This activity reestablishes electrical power to existing components. No changes to waste affecting energy sources will occur.

- g. Have multiple minor changes been made to this system such that the cumulative affect of the changes would constitute a major change?

Yes No

Justification for question answered "No": This activity reestablishes electrical power to existing components.

4. Is this a Minor Change?

- a. Is this a change that does not meet the criteria for a Specified Activity, Major Project, or Major Change?

Yes No

Justification for question answered "Yes": All answers in section 1 to 3 were answered "No".

- b. Is this a facility modification or project that does not involve radioactive or hazardous materials and cannot impact the safe operation of existing systems, structures, or components used in the storage, handling and processing of radioactive and other hazardous materials?

Yes No

Justification for question answered "Yes": This activity reestablishes electrical power to existing components. Modification of components will not impact the safe operation or storage, handling, or processing of radioactive or other hazardous materials.

- c. Is this activity a document modification that does not affect or have the potential to affect the facility configuration, does not change the design basis for equipment, or does not change controls affecting operations involving radioactive or hazardous materials?

Yes No

Justification for question answered "Yes": N/A

5. Has the change been previously evaluated in a PrHA?

- a. Has the scope of this specific change been previously evaluated in a PrHA?

Yes No

Document Number or other reference: N/A

12. Hazard Analysis Technique Selection: (see instructions)

1. Full HAZOP

Yes No

The change affects multiple components/systems.

Justification: N/A

2. Delta HAZOP (focused mainly on changes and interfaces)

Yes No

The change affects a limited part of a system or process already evaluated by a full HAZOP.

Justification: N/A

3. What-if/Checklist

Yes No

PROCESS HAZARDS ANALYSIS SCREENING

PrHA-00034 R1
Page 4 of 4

For simple well defined changes that are not suited to HAZOP technique.

Justification: N/A

4. Other Technique (Requires approval of Process Analysis Director)

Yes No

Other techniques such as Failure Modes & Affects Analysis or Fault Tree may be appropriate for specific changes.

Technique: N/A

Discussion: N/A

5. PrHA Not Required (Requires approval of Process Analysis Director if major change)

Yes No

Change is a minor change, has been previously evaluated in a PrHA, or is defined as a major change, but other hazard analysis (e.g., Job Hazards Analysis) or design review processes are adequate to review this change.

Justification: The reestablishment of electrical power to the ENRAF at S-102 screens out a minor change.

13. Additional Information (see instructions):

N/A

ALARA MANAGEMENT WORKSHEET (AMW)

AMW Number AW - 1400	Work Package No./Procedure CLO-WO- 07-1840	Date 04/14/2008	Page 1 of 9
PART I ADMINISTRATIVE	RWP Number CO-462	Survey Number COO-004565- COO-004567/ See Sec.III-A	Area/Facility/Location 200W/241-S/S-102

Job Title/Description of Work:
Remove Miscellaneous Equipment

Identify what triggered the completion of this AMW:

<input type="checkbox"/> Estimated dose >1 rem	<input type="checkbox"/> Potential release of radioactive material >DOE 232.1 requirements
<input type="checkbox"/> Work area dose rate >1 rem/hr	<input type="checkbox"/> Predicted airborne radioactivity in excess of the DAC or integrated exposure of 200 DAC/hrs
<input type="checkbox"/> Management request	<input type="checkbox"/> First time or infrequent activity (High Risk Review Required) (RadCon Oversight Required)
<input type="checkbox"/> Radiological Control request	<input type="checkbox"/> Extremity dose
<input type="checkbox"/> Removable contamination in excess of 100 times Table 2-2	<input checked="" type="checkbox"/> Other TFC-ESHQ-RP_RWP-C-03, ALARA Work Planning, requirement, high radiological risk work.

PART II REVIEW

A. What is the radiological risk classification and reason for the work activity?

- In accordance with the guidance contained in TFC-ESHQ-RP_RWP-C-03, "ALARA Work Planning", this task has been determined to be HIGH radiological risk.
- The High risk category has been determined due to:
 - Non-routine or complex activities in work areas where removable contamination is estimated to be $\geq 100,000$ dpm/100cm² Beta-Gamma or $\geq 2,000$ dpm/100cm² Alpha in the general area, or in the work area such that the workers' personal protective equipment will be expected to come in contact with this level of contamination
 - Radiological activities that are infrequently conducted or represent first time operations.
 - Work involving items which have been inside an underground waste tank

B. Can additional or temporary shielding be used to reduce dose rates?

- All equipment/soil having high dose rates will have been removed prior to this evolution, thus precluding the need for additional or temporary shielding.
- As delineated on RWP CO-462, higher than expected extremity dose rates may require the use of lead gloves and/or rubber matting.

C. What time-saving procedure techniques, training, monitoring, mock-ups, or additional dosimetry will be used? (Need for and level of mockup approved. RS Ops Dir)

- Time-saving procedure techniques
 - A walk down of the job location to assess the proper tools and equipment needed to perform these tasks and pre-staging of items at the job site will be employed. These are the time-saving techniques.
- Training
 - Radiological Worker II training is required for all personnel working under the control of RWP CO-439.
- Monitoring
 - Continuous HPT coverage is required for all work activities inside the HRA/HCA
 - Intermittent coverage is required during setup and cleanup activities outside the HRA/HCA.

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ALARA MANAGEMENT WORKSHEET (AMW)

AMW Number	Work Package No./Procedure	Date	Page 2 of 9
AW - 1400	CLO-WO- 07-1840	04/14/2008	

- Mock-ups
 - Previous proof of concept dry runs were performed to ascertain the most effective methods of dressing, undressing, and performing the work activities in the S-102 HRA/HCA spill area.
- Additional Dosimetry
 - All personnel entering any HRA will wear an electronic dosimeter on the front-waist area of the outer set of PPE. This dosimeter will have the maximum dose alarm set at 80% of the remaining ACL or as directed by Radcon management and the dose rate alarm set at 1500 mrem/hr.
 - Personnel entering the RA shall wear a pocket dosimeter or equivalent (electronic dosimeter).

D. What alternatives can be employed (e.g., special tools, ventilation, cross-crafting, remote tools, containments, engineered controls) to reduce the amount of time in the work area?

- No special tools or ventilation is necessary for this work.
- Cross-crafting:
 - Cross-crafting will not be used for this work.
- Containments/Engineering Controls:
 - Containments will not be used for these work activities although ground cover, suppressants such as water sprayers with approved fixatives (Safeguard, Soil Sement) and suspending excavating activities at wind speeds > 25 mph will be used to control the airborne and spread of contamination during job activities.

E. List/describe measures employed to control contamination and the generation of airborne radioactivity, as applicable.

- Ground covers and drapes will be employed around the Breather Filter and the Camera Port during those portions of the work.
- The ENRAF section of this work is external electrical work and requires no additional contamination controls other than the normal HCA controls in effect in the work area.
- Camera equipment will have sleeving attached prior to insertion into tank, and will be removed into sleeving when it exits the tank.
- The work area is posted as an ARA and will remain so at the conclusion of this work. Workplace grab air sampling and lapel air sampling will be performed while personnel are in the ARA.
- Dose Rate and Contamination limits are specified in RWP CO-462.

F. Complete the dose estimate. What are the person-hours and collective/individual dose estimates for the work activity?

- The Whole Body dose estimate for this job is 1397 mrem. This number was calculated as follows:
- Based on knowledge of previous similar work activities and review of area surveys, the following assumptions are made:
 - Dose Rates
 - Work inside the HRA at the work location – 20 mrem/hr
 - Dose rate at nearest HRA fence location – 0.6 mrem/hr
 - When workers will be in and out of the direct work area during a particular activity – 10 mrem/hr
 - Crew Size and time Estimates are shown in the Dose Estimation Matrix

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ALARA MANAGEMENT WORKSHEET (AMW)

AMW Number	Work Package No./Procedure	Date	Page 3 of 9
AW - 1400	CLO-WO- 07-1840	04/14/2008	

Activity	# of people	hrs/person	mrem/hr	exposure
Set-up area				
Operators	4	2	10	80
HPT	2	2	10	40
FWS	1	2	10	20
IHT	1	2	10	20
Surveys				
HPT	2	1	20	40
FWS	1	0.1	0.6	0.06
IHT	1	0.1	0.6	0.06
Remove Siuice Hose				
Operators	2	3	20	120
HPT	2	3	20	120
FWS	1	3	10	30
IHT	1	3	10	30
Replace Breather Filter				
Operators	2	4	10	80
PF	2	1	20	40
HPT	2	4	10	80
Sheet Metal	2	1	20	40
FWS	1	4	0.6	2.4
IHT	1	4	0.6	2.4
Pigtall ENRAF				
Operators	2	2	10	40
Electricians	2	2	10	40
HPT	1	2	10	20
FWS	1	2	0.6	1.2
IHT	1	2	0.6	1.2
Calibrate ENRAF				
Operators	2	2	10	40
HPT	1	2	10	20
Inst. Techs.	2	2	20	80
FWS	1	2	0.6	1.2
IHT	1	2	0.6	1.2
Install Camera				
Operators	2	2	20	80
PF	2	1	20	40
HPT	2	2	10	40
FWS	1	2	0.6	1.2
IHT	1	2	0.6	1.2
Perform Video				
Operators	2	4	10	80
HPT	1	4	10	40
FWS	1	4	0.6	2.4
IHT	1	4	0.6	2.4
Area Clean-up and Restoration				
Operators	4	2	10	80
HPT	1	2	10	20
FWS	1	2	10	20

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ALARA MANAGEMENT WORKSHEET (AMW)

AMW Number	Work Package No./Procedure	Date	Page 4 of 9
AW - 1400	CLO-WO- 07-1840	04/14/2008	

TOTAL	1396.92
Operators	600
HPT	420
PF	80
Electricians	40
FWS	78.46
IHT	58.46
Sheet Metal	40
Inst. Techs.	80

- The Whole Body dose estimate for this job is 2950 mrem. This number was calculated as follows:
- Based on knowledge of previous similar work activities and review of area surveys, the following assumptions are made:

Dose Rates

- Performing Hands-on work – 50 mrem/hr
- Close-in work which is not continuous for the duration of the particular activity – 25 mrem/hr

Activity	# of people	hrs/person	mrem/hr	exposure
Remove Sluice Hose				
Operators	2	3	50	300
HPT	2	3	50	300
Replace Breather Filter				
Operators	2	4	50	400
PF	2	1	50	100
HPT	2	4	25	200
Sheet Metal	2	1	50	100
Pigtail ENRAF				
Operators	2	2	25	100
Electricians	2	2	25	100
HPT	1	2	25	50
Calibrate ENRAF				
Operators	2	2	25	100
HPT	1	2	25	50
Inst. Techs.	2	2	50	200
Install Camera				
Operators	2	2	50	200
PF	2	1	50	100
HPT	2	2	25	100
Perform Video				
Operators	2	4	25	200
HPT	1	4	25	100
Area Clean-up and Restoration				
Operators	4	2	25	200
HPT	1	2	25	50
TOTAL				2950

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ALARA MANAGEMENT WORKSHEET (AMW)

AMW Number	Work Package No./Procedure	Date	Page 5 of 9
AW - 1400	CLO-WO- 07-1840	04/14/2008	

Operators	1500
HPT	850
PF	200
Electricians	100
FWS	0
IHT	0
Sheet Metal	100
Inst. Techs.	200

G. What measures have been identified for minimization and disposal of radioactive waste?

- Radioactive waste will be handled according to the provisions of procedure TO-100-052, "Perform Waste Generation, Segregation and Accumulation".
- The Field Work Supervisor will ensure only necessary equipment and material will be allowed into controlled radiological areas.

H. What methods have been planned to control the spread of contamination (water spray, fixative, ventilation, etc.) and can the areas be decontaminated to reduce risk?

- Ground covers and drapes will be employed around the Breather Filter and the Camera Port during those portions of the work.
- The ENRAF section of this work is external electrical work and requires no additional contamination controls other than the normal HCA controls in effect in the work area.
- Camera equipment will have sleeving attached prior to insertion into tank, and will be removed into sleeving when it exits the tank.
- The work area is posted as an ARA and will remain so at the conclusion of this work. Workplace grab air sampling and lapel air sampling will be performed while personnel are in the ARA.
- Dose Rate and Contamination limits are specified in RWP CO-462.

I. Are the radiological control levels of multiple RWPs compatible?

- RWP CO-462 provides radiological requirements and guidance for the work package work activities. No other RWP will be used for work on this package.

J. Can exposure/contamination levels be reduced by flushing lines or reducing radiation sources?

- No, the dose rate in the area has been reduced by contaminated soil removal to the maximum extent practicable.

K. What phases of the work can be moved to an area with lower exposure levels, prefabricated, or performed as shop work?

- The Radial Breather Filter Assembly will be assembled in the shop
- The camera Top-Hat Assembly will be built prior to moving to the field.

L. Describe the lessons learned that were reviewed and incorporated into the work packages.

- **IB-08-003** – discusses the need for workers to understand the scope of the job and to realize the consequences of deviating from that scope.
 - Corrective Action – Steps have been incorporated into the work package instructing the workers to secure work if unexpected conditions outside the scope of the job occur.

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ALARA MANAGEMENT WORKSHEET (AMW)

AMW Number	Work Package No./Procedure	Date	Page 6 of 9
AW - 1400	CLO-WO- 07-1840	04/14/2008	

M. What existing material, tools, or equipment currently at the job location can be used to complete the job (contaminated materials or tools) and what items or special tools must be staged?

- There currently are no existing materials, tools or equipment at the job location that can be used to complete this job.
- The FWS will ensure that all necessary materials, tools, and equipment needed to complete this job will be brought to the job location.

N. Where are the radiological control hold points, second party and independent verifications included in the technical work document and why?

- There are no radiological hold points, second party or independent verifications included in the technical work document.

O. Can dry-runs or walkdowns be utilized to improve process?

- A walkdown of the activity will be performed with the crew as part of the pre-job briefing to minimize the time in the area.

P. Have emergency and abnormal procedures/plans been reviewed?

- There are no special emergency or abnormal procedures/plans associated with this work activity.
- As part of FWS qualification the FWS demonstrates knowledge of the general CO emergency response expectations and abnormal operating procedures.
- The FWS will provide pertinent information (e.g. location of decontamination equipment/facilities; identification of first aid responders; etc.) to the work team during the pre-job briefing.
- Emergency and abnormal procedures and plans for this work will be covered in the pre-job briefings.

Q. Are success criteria and contingency plans identified?

- Success criteria:
 - The work is completed without injury.
 - The work is completed within the Individual & Collective Exposure Estimates.
 - The work is completed without a loss of contamination control or the generation of airborne radioactivity ≥ 0.2 DAC outside of a posted ARA.
 - The work is completed without a personal or clothing (other than PPE) contamination event.
 - The work is completed within the scheduled time frame.
- Contingency Plans:
 - Contingencies for Safe Condition Levels and Action Levels are identified in RWP CO-462.

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PART III METHODS OF DETERMINING

A. Airborne:

- Numerous air samples (CR08-00647 through CR08-00666) taken during soil excavation in the area showed no airborne concentrations above background levels.
- Grab air sampling and lapel air sampling will be performed during this work.

B. Dose Rate:

- Survey # COO -004565 indicates that dose rates in the work area after soil removal are 50 mrem/hr shallow dose and 20 mrem/hr deep dose.
- Survey # COO-004567 indicates a dose rate of 0.6 mrem/hr at the nearest HRA boundary to the work area. This would be the closest Low Dose Waiting Area to the work area.

ALARA MANAGEMENT WORKSHEET (AMW)

AMW Number

Work Package No./Procedure

Date

Page 7 of 9

AW - 1400

CLO-WO- 07-1840

04/14/2008

C. Contamination Level:

- Survey # COO-004565 indicates that soil samples in the excavation area (post-excavation) indicate 7000 dpm/sample. All area smears indicate <1000 dpm/100cm² Beta-Gamma and < 20 dpm/100cm² Alpha.

D. Containment Needs:

- The following containment analysis for the ENRAF and Breather Filter portions of the work using the recommended containment matrix in TFC-ESHQ-RP_RWP-C-02, "Radiological Containment", identifies the containment category as low risk with a drape as the recommended containment.

Removable Contamination Level ¹	Contamination Stability	Work Activity	Containment Category ^{2,3,4,5}			
<10 times Table 2-2 6	High 4	Simple material movement 5	Very Low Risk Total = 15-20			
<100 times Table 2-2 12	Medium 8	Vigorous material movement 10	Low Risk Total = 21-31			
>100 times Table 2-2 18	Low 12	Use of power tools in area or manual cutting, shaping, or abrading of material 15	Moderate Risk Total = 32-45			
>1000 times Table 2-2 24		Use of low velocity power tools to cut, shape, or abrade material 20	High Risk Total >45			
		Use of high velocity power tools to cut, shape, or abrade material 25				
18	+	_4_	+	_5_	=	_27_

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- The following containment analysis for the Camera portion of the work using the recommended containment matrix in TFC-ESHQ-RP_RWP-C-02, "Radiological Containment", identifies the containment category as moderate risk with total containment as the recommended containment. Sleeving will be employed to insert and withdraw any camera equipment.

ALARA MANAGEMENT WORKSHEET (AMW)

AMW Number AW - 1400	Work Package No./Procedure CLO-WO- 07-1840	Date 04/14/2008	Page 8 of 9
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Removable Contamination Level ¹	Contamination Stability	Work Activity	Containment Category ^{2,3,4,5}			
<10 times Table 2-2 6	High 4	Simple material movement 5	Very Low Risk Total = 15-20			
<100 times Table 2-2 12	Medium 8	Vigorous material movement 10	Low Risk Total = 21-31			
>100 times Table 2-2 18	Low 12	Use of power tools in area or manual cutting, shaping, or abrading of material 15	Moderate Risk Total = 32-45			
>1000 times Table 2-2 24		Use of low velocity power tools to cut, shape, or abrade material 20	High Risk Total >45			
		Use of high velocity power tools to cut, shape, or abrade material 25				
<u> 24 </u>	+	<u> 8 </u>	+	<u> 10 </u>	=	<u> 42 </u>

E. Other:

- Bioassay for this work activity is required by RPP-27854, "Closure Operations Facility Source Term report". This includes a ten minute whole body count. Pu urinalysis, Sr urinalysis, and a chest count for personnel performing hands-on work with contaminated components. Personnel performing hands on work with contaminated components shall ACE in with the appropriate GW or WW Role and COBIO Role.

PART IV DATA RELIABILITY

CRITERIA	YES	NO	UNKNOWN
A. Is there reliable radiological survey data from the same location (e.g., pit, tank, piping, hood) for the same type of activity? Survey Report/Air Sample Number(s):	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
B. Is there a pre-job or investigative survey from the area in question? Survey Report/Air Sample Number(s): COO-004565-COO-004567/ See Sec.III-A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
C. Is there reliable TWINS data for the area/location in question?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
D. Is there documented process knowledge indicating that radiological conditions identified in A, B, and/or C above remain accurate to the planned task?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
E. Has the schedule been reviewed to ensure that additional planned scopes of work will not adversely change the radiological conditions in the work area prior to performing this task? Schedule Review Date: 04/14/2008	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

Instructions: If questions A, B, or C are answered YES, this job may proceed as planned. Questions D and E must be answered YES for the job must be planned using High risk assumptions.

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ALARA MANAGEMENT WORKSHEET (AMW)

AMW Number AW - 1400	Work Package No./Procedure CLO-WO- 07-1840	Date 04/14/2008	Page 9 of 9
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PART V AMW REVIEWS AND APPROVALS

Print and Sign	
AMW Preparer	Date
S.B. Holcomb <i>S.B. Holcomb</i>	4/22/2008
Field Work Supervisor	Date 4-22-08
<i>[Signature]</i>	
Facility/Project/RadCon Director	Date
<i>[Signature]</i>	4/22/08
Facility/Project Operations Director	Date 4/22/08
<i>[Signature]</i>	
AJRG Chairperson (high risk)	Date 4/22/08
<i>[Signature]</i>	

PART VI EMPLOYEES INVOLVED IN AMW DEVELOPMENT

Rick Matthews	Planner	K.A. Baird	FWS
Scott Conrad	Envir.	C. Lumpkin	MW
John Bores	QAE	Jerry Ferson	PF
Mike Power	Safety	Ron Frink	Fac. Rep
Kevin Hull	Engr.	Trent Mooney	HPT
Doug Edwards	HPT	Ron Tucker	Proj. Mgr.
Ben Bricker	Rigger	M.N. Johnson	FWS
S.B. Holcomb	Rad Con SME	K.L. Jones	IHT
Ron Harding	IHT		
G.M. Davis	Rad Con FLM		
Ed Youngblood	Maint.		

COPY

WO Id: CLO-WO-07-1840

Waste Planning Checklist

1. Will waste be generated?	Yes	CHEMICAL/PAINT PRODUCTS	
2. Will waste be generated in a radiological buffer area or contamination area?	Yes	Mds No	Chemical / Product Name
3. Will EQ be removed? (TF-cover blocks, 222S-Process EQ)	Yes	020641	SAFEGARD 5022A
4. Will waste contact process waste, tank waste, or tank waste contaminated material?	Yes		
5. Will work involve soil removal?	No		
6. Will there be any aerosol can(s) disposed of?	No		
7. Will asbestos waste be disposed of?	No		
8. Will HEPA filters be disposed of?	Yes		
9. Will chemical products or paint be used or disposed of?	Yes		
10. The following waste minimization techniques will be used?	Waste segregation and source reduc		

11. GENERAL DESCRIPTION OF WASTE
 Rags, sleeving, G-1 breather filter housing and filter media, wire, tape, 4" blind flange, Raw Water hose (approx. 50ft.), absorbent pads/material, misc.....

11a. Estimate Waste Generated Quantity: 200 LBS Per: Week Job Length: 1 week

WASTE MANAGEMENT CONTROLS

Comments

12. Is Waste Regulated as a Dangerous Waste? Yes Tank waste contaminated

12a. Disposition Instructions:

General Instructions:

- Bring into the radioactive contamination area only product/materials needed for the job.
- Survey and release unused product, then return to stock for future use.
- Segregate mixed waste from low-level waste.

Mixed Waste Disposal:

- Dispose of any waste that contacts tank waste/tank contaminated materials as mixed waste (MW).
- FWS to request a container for this waste stream and ensure delivery prior to the start of the job.

Low-Level Waste Disposal:

- Place all other waste that has not contacted tank waste/tank contaminated materials into the nearest low-level waste collection container/shed.

Other Instructions:

- Package waste in accordance with TO-100-052 procedure.
- FWS to ensure container availability for each waste stream or request container(s) and ensure delivery prior to the start of the work.

Designation Note:

- Safeguard 5022A is regulated as a product, but on debris in small amount (<5% by wt.) is no longer regulated.

13. Facility Operations has been notified to take samples? (N/A if not required)	N/A	
14. Is a container already available for each disposition listed in the instructions?	No	Request container for MW
15. Does the quantity of the waste exceed capacity of available containers?	No	
16. Identify satellite accumulation area or accumulation area container(s) locations:	Request-MW/LLW Collection Cont'r	

Prepared By: Mandrake Pascual

Date: 04/15/2008

Complete:

Use Procedure 5-LCD-300 ENRAF Series 854 DISPLCR & CAL, to calibrate ENRAF Correct [RL] Value: 556.27

Use Procedure 5-LCD-300 ENRAF SERIES 854 DISPLCR & CAL, to calibrate ENRAF.

CORRECT [RL] VALUE: 556.27

- | | | |
|-----|---|--|
| 1. | AS-FOUND TANK LIQUID LEVEL | <u>31.12</u> |
| | AS-FOUND TMACS TANK LIQUID LEVEL | <u>n/a</u> |
| 2. | VISUAL INSPECTION | |
| | SIGHT GLASS ASSEMBLY APPEARANCE | <u>OK</u> |
| | DISPLACER APPEARANCE | <u>OK</u> |
| | WIRE APPEARANCE | <u>OK</u> |
| 3. | AS-FOUND [WQ] VALUE | <u>23799623 E+03</u> |
| 4. | AS-FOUND PROGRAMMED DISPLACER WEIGHT [DW] | <u>23149938 E+03</u> |
| 5. | WAS FLUSH PERFORMED? | YES ___ NO <input checked="" type="checkbox"/> |
| 5A. | POST-FLUSH [WQ] VALUE | <u>n/a</u> |
| 6. | WAS DISPLACER REPLACED? | YES ___ NO <input checked="" type="checkbox"/> |
| 7. | NEW [DW] | <u>23799623 E+03</u> |
| 8. | [WQ] - 15 GRAMS = ([S1], [S3], [RM]) | <u>22299623 E+03</u> |

CALIBRATION CHECK

- | | | |
|-------|--|--|
| 9. | AS-FOUND [RL] VALUE | <u>556.28</u> |
| AC10. | AS-FOUND [RL] AND CORRECT [RL] VALUE MATCH TO +/- .10 INCHES | YES <input checked="" type="checkbox"/> NO ___ |

CRAFT INITIAL

- | | | |
|-----|-----------------------|---------------|
| 11. | PROGRAMMED [RL] VALUE | <u>556.27</u> |
|-----|-----------------------|---------------|

Use Procedure 5-LCD-300 ENRAF Series 854 DISPLCR & CAL, to calibrate ENRAF Correct [RL] Value: 556.27

- 12. PROGRAMMED [RL] AND CORRECT [RL] MATCH EXACTLY YES NO
- AC13. AS-LEFT [RL] AND CORRECT [RL] VALUE MATCH TO +/- .10 INCHES YES NO

CRAFT INITIAL Jm4

14. AS-FOUND [TT] 580.60

15. PROGRAMMED [TT] 580.62

AS-FOUND [TT] AND CORRECT [TT] VALUE MATCH TO +/- .10 INCHES YES NO

16. AS-LEFT [TT] 580.62

17. AS-LEFT LIQUID LEVEL 31.12

AS-LEFT TMACS LIQUID LEVEL n/a

AS LEFT LIQUID LEVEL & AS-LEFT TMACS LIQUID LEVEL MATCH TO WITHIN +/- 0.2 INCHES YES NO N/A

ELECTRICAL BOX LATCHES

EVALUATE CONDITION OF LATCHES: SAT UNSAT

IF UNSAT, INITATE REPAIR AS NECESSARY.

Engineer to accept this calibration and update PM data sheet WT-3653 in Champs.

**Removed. as part of spill clean-up Jm4 4/27/08*

4/23/2008 7:38 AM

WORKING COPY

T S R Compliance

Tank Farm Maintenance Procedure

CALIBRATION



Double click to change COPY type

ENRAF Series 854 Displacer Weight Check and Calibration Check and Obtain Sediment Levels

PCA Incorporated:	TF-2008-0510	
Procedure Signatures for:	5-LCD-300.G8	
Type of Change:	PCA	
Review Designator:	N/A	
USQ Screening Number:	TF-08-0630-D, Rev. 0	
POSITION/ORG	DELEGATE	DATE
INST	<u>L. E. Newquist</u>	<u>03/31/2008</u>
FWS	<u>Gary Jackson</u>	<u>03/31/2008</u>
Surv. Sys. Eng	<u>D. Barnes</u>	<u>04/01/2008</u>
Technical Writer	<u>John Hobbs</u>	<u>04/11/2008</u>
Approval Authority	<u>R. P. Tucker</u>	<u>04/11/2008</u>
Justification: Engineering request for additional instructions/clarification.		
Summary of Changes: Reword Steps 5.3.20 and 5.3.22.		

Next Periodic Review Date — 11/23/2009

The following organization(s) have determined their need to review this procedure at the next periodic review cycle: Technical Authority, Environmental and Radiological Control.

Type	Document No.	Rev/Mod	Release Date	Page
CONTINUOUS	5-LCD-300	G-8	04/11/2008	1 of 28

Table of Contents**Page**

1.0	PURPOSE AND SCOPE.....	3
1.1	Purpose.....	3
1.2	Scope.....	3
2.0	INFORMATION.....	3
2.1	General Information.....	3
2.2	Terms and Definitions.....	3
3.0	PRECAUTIONS AND LIMITATIONS.....	3
3.1	Personnel Safety.....	3
3.2	Equipment Safety.....	4
3.3	Radiation and Contamination Control.....	4
3.4	Limits.....	4
4.0	PREREQUISITES.....	5
4.1	Special Tools, Equipment, and Supplies.....	5
4.2	Performance Documents.....	5
4.3	Field Preparation.....	5
5.0	PROCEDURE.....	6
5.1	Computer Setup Guidance.....	6
5.2	PET Setup.....	10
5.3	Displacer Weight Check.....	11
5.4	Calibration Check.....	15
5.5	Determine Sediment Level.....	20
5.6	Check for Alarms and Current Output.....	23
5.7	Restoration.....	23
5.8	Acceptance Criteria.....	25
5.9	Review.....	25
5.10	Records.....	25
	Table 1 - Gauges with Flow-Tek Ball Valves.....	26
	Figure 1 - Laptop/Desktop Setup Schematic.....	27
	Figure 2 - ENRAF Terminal Compartment Serial Connection.....	28

Type	Document No.	Rev/Mod	Release Date	Page
CONTINUOUS	5-LCD-300	G-8	04/11/2008	2 of 28

1.0 PURPOSE AND SCOPE

1.1 Purpose

This procedure provides instructions for periodic measurement of displacer weight and calibration check for ENRAF Model 854 level gauges and densitometers. This procedure also provides instructions for obtaining sediment levels.

1.2 Scope

The DSA credits tank level instrumentation for providing "defense-in-depth" waste transfer material balances, DST primary tank leak detection for leaks to annulus, and catch tank level limits. Tank sediment levels are used for waste compatibility evaluation and Buoyant Displacement Gas Release Event calculations.

2.0 INFORMATION

2.1 General Information

Portions of this procedure may be performed independently as directed by Shift Manager or Work Order.

2.2 Terms and Definitions

PET - Portable ENRAF Terminal

3.0 PRECAUTIONS AND LIMITATIONS

3.1 Personnel Safety

- 3.1.1 Perform work in accordance with TFC-ESHQ-S-STD-03, Electrical Safety to prevent injury to personnel.
- 3.1.2 Lockouts and tagouts or over-tagging requirements shall be performed in accordance with TFC-OPS-OPER-C-05.

Type	Document No.	Rev/Mod	Release Date	Page
CONTINUOUS	5-LCD-300	G-8	04/11/2008	3 of 28

3.2 Equipment Safety

CAUTION - If the isolation valve is closed without raising the displacer, it will sever the wire causing the displacer to drop into the tank, and the tension release to "rat-nest" the wire on the drum.

CAUTION - Damage may occur if ball valve is over torqued.

3.3 Radiation and Contamination Control

3.3.1 Work in radiological areas will be performed using a Radiological Work Permit following review by Radiological Control per the ALARA work planning procedure TFC-ESHQ-RP_RWP-C-03.

3.3.2 If during performance of this procedure, radiation levels approach/exceed RWP whole-body exposure limits, stop work protocol will be observed, and notifications will be made in applicable work steps of this procedure.

3.4 Limits

HNF-IP-1266, Tank Farms Operations Administrative Controls.

AC 5.11 Transfer Controls
AC 5.15 Tank Farm Instrumentation

Type	Document No.	Rev/Mod	Release Date	Page
CONTINUOUS	5-LCD-300	G-8	04/11/2008	4 of 28

4.0 PREREQUISITES

4.1 Special Tools, Equipment, and Supplies

NOTE - Limit amount of material taken into contaminated areas to minimize radioactive waste and future decontamination.

The following supplies may be needed to perform this procedure:

- Calibration unit - Portable ENRAF Terminal (PET) Model No. 847
- Laptop or desktop computer using ENRAF "Logger" or "ENTIS" software (optional)
- 0-600 ft-lb torque wrench when operating Flow-Tek ball valves (See Table 1)
- Torque wrench adapter for the valve stem.

4.2 Performance Documents

The following documents may be needed during the performance of this procedure:

- TO-020-420, Clean Level Indicating Transmitter Tapes, Plummets and Displacers; Replace Food Instrument Corporation/Tapes and Plummets
- ENRAF Series 854 ATG Level Gauge Instruction Manual, Version 2.2.

4.3 Field Preparation

- 4.3.1 **IF** gauge is connected to Tank Monitoring and Control System, **NOTIFY** TMACS by phone at (373-2618) of intent to perform this procedure.
- 4.3.2 **CHECK** PET powers up.
- 4.3.3 **COMPLY** with lock and tag requirements, as applicable.
- 4.3.4 **IF** during performance of this procedure, any of the following conditions are found:
- Any equipment malfunction, which could prevent fulfillment of its functional requirements.
 - Personnel error or procedural inadequacy, which could prevent fulfillment of procedural requirements.

PERFORM the following:

- 4.3.4.1 **STOP WORK** immediately.
- 4.3.4.2 **PLACE** equipment in a safe condition
- 4.3.4.3 **NOTIFY** Supervision and proceed as directed by FWS.

Type	Document No.	Rev/Mod	Release Date	Page
CONTINUOUS	5-LCD-300	G-8	04/11/2008	5 of 28

5.0 PROCEDURE

NOTE - When being performed in SST, displacer may be raised to below ground level from maintenance screen at TMACS terminal.

- If performance of any steps in this procedure is not required for procedure completion, steps not performed are to be marked, "N/A" in appropriate Data Sheet signoff space, and explained in comments/remarks section of Data Sheet.
- This procedure may be used on multiple ENRAFs at the same time.
- If using the laptop/desktop computer in addition to the PET as a gauge interface, perform Section 5.1. If not using the laptop/desktop computer Section 5.1 may be skipped.

5.1 Computer Setup Guidance

Limit - AC 5.11 Transfer Controls

5.1.1 CONTACT Shift Manager AND

ENSURE the following:

- There are no active transfers that the performance of this procedure would interfere with.
- Approval has been granted to perform this procedure per the work package.

5.1.2 CONNECT infrared connector from PET to ENRAF.

5.1.3 TURN PET ON.

Type	Document No.	Rev/Mod	Release Date	Page
CONTINUOUS	5-LCD-300	G-8	04/11/2008	6 of 28

5.1 Computer Setup (Cont.)

5.1.4 **ENTER** TA command, note gauge address displayed in PET display, (i.e., TA05), **AND**

TURN PET OFF.

5.1.4.1 **ALTERNATIVELY**, TA may be obtained from shop log file or engineer for gauge in question.

WARNING

Follow electrical practices as prescribed in TFC-ESHQ-S-STD-03

5.1.5 **IF** connecting computer and PET to gauge, **CONNECT** to terminals "TT"

5.1.5.1 **POWER UP** PET/gauge, as required, **AND**

GO TO Step 5.1.7.

5.1.6 **IF** connecting the computer and PET to CIU terminal strip, **PERFORM** the following:

5.1.6.1 **TURN OFF** power to CIU board before connecting comm wires.

5.1.6.2 **REMOVE** field wires from CIU terminal strip, **AND**

CONNECT in "TT" wires to the PET.

5.1.6.3 **POWER UP** PET, as required.

5.1.7 **PLACE** PET in SETUP MODE by **PRESSING** keys "control" and "esc" at the same time.

5.1.8 **PRESS** down arrow (↓) on PET keyboard until MODE is displayed at the top of PET display.

5.1.9 **PRESS** right arrow (→) until cursor is underneath RS232.

5.1.10 **PRESS** down arrow (↓) until display on PET reads "IR Baudrate".

5.1 Computer Setup (Cont.)

- 5.1.11 **ENSURE** cursor is underneath 2400.
- 5.1.12 **REPEAT** Steps 5.1.10 and 5.1.11 for “EW Baudrate” and “RS232 Baudrate”.
- 5.1.13 **PRESS** down arrow until PET display reads SETUP MODE, **AND PRESS** “control” and “esc” at the same time.
- 5.1.14 **TURN ON** computer.
- 5.1.14.1 **IF** necessary, **RESPOND** “no” to accessing network resources, **AND PRESS** any key to continue.
- 5.1.15 **IF** using MS-DOS, **PERFORM** the following:.
- 5.1.15.1 **ACCESS** logger directory at c:\> prompt by **TYPING** cd\logger.
- 5.1.15.2 **START** logger program by **TYPING** LOGV18, **AND SKIP** to Step 5.1.17.
- 5.1.16 **IF** using Windows, **START** by clicking icon labeled “LOGV18” to enter logger program.
- 5.1.17 **HIGHLIGHT** item #1, “Setup system”, using computer arrow keys, **AND PRESS** enter.
- 5.1.18 **HIGHLIGHT** item #4, “Gauge address”, **AND PRESS** enter.
- 5.1.19 **ENTER** gauge address noted from Step 5.1.4 (note the flashing cursor), **AND PRESS** enter.

Type	Document No.	Rev/Mod	Release Date	Page
CONTINUOUS	5-LCD-300	G-8	04/11/2008	8 of 28

5.1 Computer Setup (Cont.)

5.1.20 **ENSURE** other parameters shown in "SETUP MENU" display match parameters shown below.

5.1.20.1 **IF** parameters do not match, **CHANGE** them using procedure in Steps 5.1.18 and 5.1.19.

SETUP MENU

```

1 ) RS232C port & Baudrate          (port 1 @ 2400 Baud.)
2 ) Add header to every file        (N)
3 ) Ciu address                      ()
*4 ) Gauge Address                  (XX)
5 ) Max. number of records in file LOGV18.CYC (100)
6 ) Name cyclusfile                 (LOGV18.CYC)
7 ) Max. number of retries per CIU request (3)
8 ) Timeout CIU                     (.9 sec.)
9 ) Turn_around delay               (0 sec.)
A ) ITEM directory                   (C:\LOGGER\ITEMS\ )
B ) CYC_file directory              (C:\LOGGER\CYC )
C ) LOG_file directory              (C:\LOGGER\LOG )
D ) file_to_Field_file directory    (C:\LOGGER\FTF )
E ) Library_directory               (C:\LOGGER\LIB )
F ) RAM disk                         (\)
G ) Return to main menu

```

*XX is obtained from gauge parameter [TA]

5.1.21 **HIGHLIGHT** item #G, "Return to main menu", **AND PRESS** enter.

5.1.22 **TYPE** "y" for a yes response at prompt, "Save new setup on disk (y, n)?"

5.1.23 **HIGHLIGHT** item #2, "Send items", **AND**

PRESS enter (the system is now ready to accept commands from the computer keyboard).

5.1.24 **WHEN** "Send item" screen appears, **PRESS** key F4, B, Z, **AND**

PRESS Enter.

5.1.25 **PRESS** key F5, 1, B.

5.1.26 **PRESS** Enter, 2, B.

5.1.27 **PRESS** Enter, **AND GO TO** Step 5.2.1

5.2 PET Setup

- 5.2.1 IF PET is not already connected, **CONNECT** PET to gauge to be tested by plugging PET's optical coupler into socket located on left side of gauge when facing display, **AND**
PRESS ON/RESET button.
- 5.2.2 **RECORD** display reading as As-Found tank liquid level after gauge stabilizes in Step 1 on Data Sheet.
- 5.2.3 IF tank liquid level is sent to MCS, **RECORD** MCS display reading as As-Found MCS tank liquid level in Step 1 on Data Sheet.
- 5.2.4 IF MCS reading is not available or not sent to MCS, **RECORD** MCS tank liquid level as "N/A" in Step 1 on Data Sheet.
- 5.2.5 IF tank liquid level is sent to TMACS, **RECORD** TMACS display reading as As-Found TMACS tank liquid level in Step 1 on Data Sheet.
- 5.2.6 IF TMACS reading is not available or not sent to TMACS, **RECORD** TMACS tank liquid level as "N/A" in Step 1 on Data Sheet.
- 5.2.7 **ENTER** command = [MH]. (This is the Motor High limit setting. The travel speed of displacer is slower when above this setting).
- 5.2.8 **ENSURE** Motor High setting is equivalent to **CORRECT REFERENCE LEVEL** value plus 15 inches \pm 1 inch.
- 5.2.9 IF Motor High setting is not correct, **PERFORM** the following:
- 5.2.9.1 **ENTER** command = [W2=ENRAF2].
- 5.2.9.2 **ENTER** command = [MH=+xxxxx.xx], where xxxxx.xx equals the **CORRECT REFERENCE LEVEL** value plus 15 inches \pm 1 inch.
- 5.2.9.3 **ENTER** command = [EX].

Type	Document No.	Rev/Mod	Release Date	Page
CONTINUOUS	5-LCD-300	G-8	04/11/2008	10 of 28

5.3 Displacer Weight Check

5.3.1 **ENSURE** an HPT is present to perform radiological monitoring.

WARNING

Displacer is potentially contaminated IF it has been in the tank.

5.3.2 **ENTER** Command = [CA] or [LT]. (This command raises displacer).

5.3.2.1 **IF** displacer is found to be stuck or too heavy, **CONTACT** Shift Manager or FWS, **AND**

PERFORM a flush per TO-020-420 before continuing.

NOTE - Displacer movement is shown by an arrow character (↑ or ↓) and a changing level reading on gauge display.

5.3.3 **IF** at any time displacer is lowered back into the tank, **REPEAT** Step 5.3.4 when displacer is raised again.

5.3.4 **WHEN** displacer rises to within approximately 50 to 75 inches of expected reference elevation, **REQUEST** HPT to monitor exposure at riser.

5.3.5 **IF** radiation levels approach/exceed RWP limits, **LOWER** displacer back into the tank (by typing [FR] then <ENTER>, and type [UN] then <ENTER> on the PET).

5.3.5.1 **STOP WORK AND PLACE** personnel in a safe location.

5.3.5.2 **NOTIFY** Shift Manager or FWS, and Radiological Control Manager (the wire and displacer may need to be flushed per TO-020-420 before continuing).

5.3.6 **ENTER** command = [FR] when the displacer is visible in sight glass.

Type	Document No.	Rev/Mod	Release Date	Page
CONTINUOUS	5-LCD-300	G-8	04/11/2008	11 of 28

5.3 Displacer Weight Check (Cont.)

NOTE - Discoloration of the displacer is expected and is permissible. Discoloration is not considered "buildup".

5.3.7 **VISUALLY EXAMINE** sight glass assembly, displacer, and approximately 3-feet of wire above the displacer, **AND**

RECORD observations in Step 2 on Data Sheet.

5.3.8 **ENTER** Command = [MF]. (This command measures the frequency of the transducer).

5.3.9 **WAIT** for "FR" to appear in the display.

5.3.10 **ENTER** Command = [WQ]. (This command displays the As-Found displacer weight).

5.3.11 **RECORD** As-Found [WQ] displacer weight in Step 3 on Data Sheet.

OR

IF flush was performed, **RECORD** post-flush [WQ] displacer weight in Step 5A on Data Sheet.

5.3.12 **ENTER** Command = [DW]. (This command displays As-Found programmed displacer weight stored in level gauge memory).

5.3.13 **RECORD** [DW] in Step 4 on Data Sheet.

Type	Document No.	Rev/Mod	Release Date	Page
CONTINUOUS	5-LCD-300	G-8	04/11/2008	12 of 28

5.3 Displacer Weight Check (Cont.)

5.3.14 IF [WQ] value is .28000000E+03 (280 grams) or greater for level gauges,

OR

IF [WQ] value is .29500000E+03 (295 grams) or greater for densitometers,

OR

IF waste or other type of buildup is visible on lower cylindrical portion of a level gauge displacer or wire,

OR

IF waste or other type of buildup is visible on any portion of a densitometer displacer or wire,

PERFORM flush per TO-020-420, **AND**

RECORD in Step 5 on Data Sheet.

5.3.15 IF a flush is not necessary, **RECORD** "no" in Step 6 on Data Sheet **AND**
PROCEED to Step 5.3.17.

5.3.16 IF flushed, **REPEAT** Steps 5.3.8 through 5.3.12.

5.3.16.1 IF, after flush, displacer weight cannot be returned to below clean weight (DW) and/or 280 grams, whichever is less.

OR

IF waste or other type of buildup is visible on lower cylindrical portion of displacer or wire, **INITIATE** a Work Package to replace displacer and wire drum, if required (wire drum need not be replaced if wire is visibly clean).

5.3.16.2 **RECORD** verification of displacer replacement in Step 6 on Data Sheet, **AND**

WHEN displacer replacement is complete, **CONTINUE** with Step 5.3.17.

Type	Document No.	Rev/Mod	Release Date	Page
CONTINUOUS	5-LCD-300	G-8	04/11/2008	13 of 28

5.3 Displacer Weight Check (Cont.)

- 5.3.17 **ENTER** command [W2=ENRAF2] (command enters protection level 2).
- 5.3.18 **ENTER** command [DW=+.xxxxxxxxE+03], where .xxxxxxxx is the last recorded [WQ] value.
- 5.3.19 **RECORD** new [DW] in Step 7a on Data Sheet.
- 5.3.20 **IF** no value is specified on the Calibration Data Sheet, **SUBTRACT** 15 grams from the as-found value of [WQ], or after flush value of [WQ], as applicable **AND**
- RECORD** this value as [S1], [S3] and [RM] in Step 8a on Data Sheet.

OR

- IF** a value other than 15 grams is specified on the Calibration Data Sheet, **SUBTRACT** the specified value from the as-found value of [WQ], **AND**
- RECORD** this value as [S1], [S3] and [RM] on Data Sheet (item H).
- 5.3.21 **ENTER** Command [S1=+.xxxxxxxxE+03], where .xxxxxxxx is the [S1] value recorded above.
- 5.3.22 **REPEAT** steps 5.3.20 through 5.3.21 for [S3] and [RM].
- 5.3.23 **CONFIRM** Command = [S2=+.05000000E+03].
- 5.3.24 **ENTER** Command = [EX]. (This command exits protection level 2).
- 5.3.25 **ENTER** Command = [FR]. (This command halts the displacer).

5.4 Calibration Check

- 5.4.1 **IF** at any time displacer is lowered back into tank after displacer has been raised, **REPEAT** Step 5.3.4 when displacer is raised again.

CAUTION

Closing the isolation valve without raising the displacer will sever the wire causing the displacer to drop into the tank, and the tension release to "rat's nest" the wire on the drum.

- 5.4.2 **CHECK**, by visual inspection, displacer can be seen through sight glass.
- 5.4.3 **IF** applicable, **REMOVE** locking device on isolation valve to allow valve position changes.
- 5.4.4 **PRIOR** to positioning valve, **VISUALLY INSPECT** valve for damage (i.e. stem twists, bends, or ball valve breaks), **AND**
RECORD findings in the comment section of the Data Sheet.
- 5.4.5 **IF** the valve cannot be positioned due to damage, **CONTACT** FWS or Engineering for direction.

CAUTION

Over torquing may cause valve damage.

- 5.4.6 **IF** working with a Flow-Tek ball valve (see Table 1), **PERFORM** the following:
- 5.4.6.1 **TO** close valve, **APPLY** up to but not exceeding 180 ft-lbs of torque.
- 5.4.6.2 **IF** valve does not close at 180 ft-lbs or less, **CONTACT** Engineering, **AND**
OBTAIN approval to increase torque values in 10 ft-lbs increments until valve closes.
- 5.4.6.3 **IF** the valve takes over 180 ft-lbs to close, **RECORD** approximate torque value (above 180 ft-lbs) in comment section of Data Sheet.

Type	Document No.	Rev/Mod	Release Date	Page
CONTINUOUS	5-LCD-300	G-8	04/11/2008	15 of 28

5.4 Calibration Check (Cont.)

- 5.4.6.4 **AFTER** valve is closed, **CYCLE** valve 3 to 4 times.
- 5.4.6.5 **IF** stem twists, bends, or ball valve breaks in any way during closing, **STOP WORK, AND**
NOTIFY Shift Manager.
- 5.4.7 **CLOSE AND SECURE** isolation valve (ball valve between riser and gauge), **AND**
IF valve cannot be closed without excessive force, **CONTACT** Engineering.
- 5.4.8 **ENTER** Command = [UN]. (This command will return gauge to operational mode. Displacer will rest on closed ball valve).
- 5.4.9 **WAIT** for level reading to stabilize.
- 5.4.10 **RECORD** displayed level reading as As-Found Reference Level (RL) in Step 9 on Data Sheet.
- 5.4.11 **ENSURE** As-Found RL is within tolerance specified on Data Sheet of Correct RL value, **AND**
RECORD AND INITIAL Step 10 of Data Sheet.
- 5.4.12 **ENTER** Command = [RL]. (This command displays the Programmed Reference Level value stored in the gauge memory).
- 5.4.13 **RECORD** the programmed Reference Level reading in Step 11 on Data Sheet.
- 5.4.14 **ENSURE** programmed RL exactly matches Correct RL value noted on Data Sheet, **AND**
RECORD on Step 12 of Data Sheet.

Type	Document No.	Rev/Mod	Release Date	Page
CONTINUOUS	5-LCD-300	G-8	04/11/2008	16 of 28

5.4 Calibration Check (Cont.)

5.4.15 **IF** As-Found value is out of tolerance specified on Data Sheet of Correct RL value, **PROCEED** with Step 5.4.16.

OR

IF As-Found value is within tolerance specified on Data Sheet of Correct RL value, but is deemed marginal (i.e. approaching specified upper or lower limit) at craftsman's discretion, **PROCEED** with Step 5.4.16.

OR

IF As-Found value is within tolerance specified on Data Sheet of Correct RL value, **GO TO** Step 5.4.17.

5.4.16 **PERFORM** RL entry.

5.4.16.1 **ENTER** Command = [W2=ENRAF2]. (This command enters protection level 2).

5.4.16.2 **IF** values DO NOT MATCH, **ENTER** Command = [RL=+XXXXX.XX] where XXXXX.XX is Correct RL Value obtained from Data Sheet or other engineering data provided in work request.

5.4.16.3 **ENSURE** displacer is resting on the ball valve before issuing command AR or calibration errors will occur

5.4.16.4 **ENTER** Command = [AR]. (This command authorizes the gauges to accept the current displacer position for [RL]).

5.4.16.5 **ENTER** Command = [EX]. (This command exits protection level 2).

5.4.16.6 **WAIT** until level reading stops changing, **RECORD** As-Left, **AND**

INITIAL Step 13 of Data Sheet.

Type	Document No.	Rev/Mod	Release Date	Page
CONTINUOUS	5-LCD-300	G-8	04/11/2008	17 of 28

5.4 Calibration Check (Cont.)

- 5.4.16.7 **IF** the displayed value of RL cannot be achieved to within tolerance specified on Data Sheet of correct [RL], **CONTACT** surveillance equipment engineer.
- 5.4.17 **ENTER** Command = [CA]. (This command raises displacer to ENRAF adapter flange).
- 5.4.18 **CHECK**, by visual inspection, displacer can be seen through sight glass.
- 5.4.19 **WHEN** displacer reaches ENRAF adapter flange and stops, **RECORD** value displayed at gauge as the As-Found TT in Step 14 on Data Sheet , **AND** **PERFORM** the following:
- 5.4.19.1 **ENTER** Command = [TT]. (This command displays the programmed Tank Top level value), **AND** **RECORD** in Step 15 on Data Sheet.
- 5.4.19.2 **IF** the programmed TT matches As-Found TT to within tolerance specified on Data Sheet, **GO TO** Step 5.4.19.7.
- 5.4.19.3 **ENTER** Command = [W2=ENRAF2]. (This command enters protection level 2).
- 5.4.19.4 **ENTER** Command = [TT=+XXXXX.XX], where XXXXX.XX is level reading when displacer is at ENRAF adapter flange.
- 5.4.19.5 **ENTER** Command = [EX].
- 5.4.19.6 **ENTER** Command = [FR].
- 5.4.19.7 **RECORD** level displayed on gauge as As-Left TT in Step 16 of Data Sheet.
- 5.4.20 **OPEN AND SECURE** isolation valve.
- 5.4.21 **ENTER** Command = [UN]. (This command returns gauge to operational mode).
- 5.4.22 **IF** displacer gets caught up either on PVC flange or on an undersized neoprene gasket **CONTINUE**, **OTHERWISE GO TO** Step 5.4.25.

5.4 Calibration Check (Cont.)

5.4.23 **ENTER** command = [I2].

NOTE - It may be necessary to repeatedly raise and lower the displacer using the CA and UN commands in order to pass the obstruction.

5.4.24 **WHEN** displacer passes the obstruction, **ENTER** command = [I1].

5.4.25 **WAIT** until level reading stops changing.

5.4.26 **RECORD** As-Left tank liquid level reading in Step 17 on Data Sheet.

5.4.27 **IF** tank liquid level is sent to MCS, **RECORD** MCS display reading as As-Found MCS tank liquid level in Step 17 on Data Sheet.

5.4.28 **IF** tank liquid level is sent to TMACS, **RECORD** TMACS display reading as As-Left TMACS tank liquid level in Step 17 on Data Sheet.

5.4.29 **IF** TMACS reading is NOT available OR NOT sent to TMACS, **RECORD** TMACS tank liquid level as "N/A" in Step 17 of Data Sheet.

5.4.30 **NOTIFY** surveillance equipment engineer and FWS if programmed RL value was not within tolerance of Correct RL value.

Type	Document No.	Rev/Mod	Release Date	Page
CONTINUOUS	5-LCD-300	G-8	04/11/2008	19 of 28

5.5 Determine Sediment Level

CAUTION

Ball valve may already be open and plummet position may be below ball valve. Changing state of ball valve with plummet positioned below will cause severe damage to valve and wire.

NOTE - If at any time a second level security password is requested, enter it and proceed.

- ENRAF will be flushed before and after taking sediment level readings.
- Perform Sediment Level Measurement as needed per Field Work Supervisor

- 5.5.1 **ENSURE** isolation ball valve is open.
- 5.5.2 **CONNECT** "PET" to gauge.
- 5.5.3 **ENTER** Command = [CA]. (This command raises displacer) **AND**
PERFORM flush of displacer and wire per procedure TO-020-420.
- 5.5.4 **AFTER** displacer reaches sight glass **ENTER** Command = [MF]. (This command measures the frequency of the transducer).
- 5.5.5 **WAIT** for "FR" to appear in the display.
- 5.5.6 **ENTER** Command = [WQ]. (This command displays the As-Found displacer weight) **AND**
RECORD displacer weight in Work Order.
- 5.5.7 **ENTER** command [W2=ENRAF2].
- 5.5.8 **ENTER** command [S2=+.0200000E+03] (20 grams).
- 5.5.9 **ENTER** [EX].

Type	Document No.	Rev/Mod	Release Date	Page
CONTINUOUS	5-LCD-300	G-8	04/11/2008	20 of 28

5.5 Determine Sediment Level (Cont.)

- 5.5.10 **WAIT** for gauge to reinitialize.
- 5.5.11 **RECORD** As-Found waste level inches in Work Record.
- 5.5.12 **ENTER** [I2].
- 5.5.13 **WAIT** for level readings to stabilize.
- 5.5.14 **RECORD** sludge level inches in Work Record.
- 5.5.15 **ENTER** command [I1].
- 5.5.16 **ENTER** command [CA] **AND**
PERFORM flush of displacer and wire per procedure TO-020-420.
- 5.5.16.1 **MONITOR** radiation levels as displacer is being raised and flushed.
- 5.5.17 **AFTER** displacer reaches sight glass **ENTER** Command = [MF]. (This command measures the frequency of the transducer).
- 5.5.18 **WAIT** for "FR" to appear in the display.
- 5.5.19 **ENTER** Command = [WQ]. (This command displays the As-Found displacer weight) **AND**
RECORD displacer weight in Work Record.

Type	Document No.	Rev/Mod	Release Date	Page
CONTINUOUS	5-LCD-300	G-8	04/11/2008	21 of 28

5.5 Determine Sediment Level (Cont.)

- 5.5.20 **ENTER** Command [W2=ENRAF2]. (This command enters protection level 2).
- 5.5.21 **ENTER** command [DW=+.xxxxxxxxE+03], where .xxxxxxxx is the last recorded [WQ] value.
- 5.5.22 **RECORD** new [DW] in Step 7b on Data Sheet.
- 5.5.23 **SUBTRACT** 15 grams from the As-Found value of [WQ], or after flush value of [WQ], as applicable, **AND**
- 5.5.24 **RECORD** value as [S1], [S3], and [RM] in Step 8b on Data Sheet.
- 5.5.25 **ENTER** Command = [S1=+.xxxxxxxxE+03], where .xxxxxxxx is [S1] value recorded above.
- 5.5.26 **REPEAT** Step 5.5.25 for [S3] and [RM].
- 5.5.27 **ENTER** command [S2=+.0500000E+03] (50 grams).
- 5.5.28 **ENTER** Command = [EX]. (This command exits protection level 2).
- 5.5.29 **ENTER** Command = [FR]. (This command halts the displacer).
- 5.5.30 **ENTER** command [UN] to return displacer to waste surface.
- 5.5.31 **DISCONNECT "PET" AND**
REPORT recorded values to engineering.

Type	Document No.	Rev/Mod	Release Date	Page
CONTINUOUS	5-LCD-300	G-8	04/11/2008	22 of 28

5.6 Check for Alarms and Current Output

5.6.1 IF applicable, **CHECK** Hi and Hi-Hi alarm setpoints per Data Sheet.

5.6.2 IF applicable, **CHECK** 4 to 20 ma current output per Data Sheet.

5.7 Restoration

NOTE - Gauges are normally left in configuration described by steps below. However, for process or troubleshooting purposes, displacer may be left at any elevation within tank, with ball valve open or closed depending on displacer position. Such configurations will be described in document referencing or requiring use of this procedure.

5.7.1 **ENSURE** isolation valve is open.

5.7.2 **IF** working on Worchester valve, **REPLACE** screw in upper left corner of isolation valve handle plate to prevent further valve position changes.

5.7.3 **DISCONNECT** all test equipment.

5.7.4 **IF** laptop/desktop was not used, **GO TO** Section 5.8.

Type	Document No.	Rev/Mod	Release Date	Page
CONTINUOUS	5-LCD-300	G-8	04/11/2008	23 of 28

5.7 Restoration (Cont.)

5.7.5 IF laptop/desktop was used with connection to gauge, **PERFORM** the following:

WARNING

Follow electrical practices as prescribed in TFC-ESHQ-S-STD-03

5.7.5.1 **DISCONNECT** laptop/desktop.

5.7.5.2 **REMOVE** "TT" from gauge.

5.7.5.3 IF applicable, **RECONNECT** field wires.

5.7.5.4 **RESTORE** gauge housing, **AND**

GO TO Section 5.8.

5.7.6 IF laptop/desktop was used with connection to CIU board, **PERFORM** the following:

5.7.6.1 **TURN OFF** power to gauge or CIU board before disconnecting comm wires.

5.7.6.2 **REMOVE** "TT" from CIU terminal strip.

5.7.6.3 **RECONNECT** field wires.

5.7.6.4 **RESTORE** power.

Type	Document No.	Rev/Mod	Release Date	Page
CONTINUOUS	5-LCD-300	G-8	04/11/2008	24 of 28

5.8 Acceptance Criteria

Limit - AC 5.15 Tank Farm Instrumentation

To satisfy the test requirements of DSA for AC 5.15, Acceptance Criteria has been met when Steps in this procedure have been satisfactorily performed and As-Left values meet the specifications and tolerance(s) per the Data Sheet.

5.9 Review

5.9.1 **INFORM** Shift Manager and FWS the maintenance is complete.

Limit - AC 5.15 Tank Farm Instrumentation

5.9.2 FWS must **REVIEW AND ENSURE** the following:

- Completed Data Sheets meet the acceptance criteria.
- Comments sections are filled out appropriately.
- Work requests needed as a result of this procedure are identified and generated.
- Work request number(s) of any work documents generated as a result of this procedure, are recorded in the Comments/Remarks section of the Data Sheet, as applicable.

5.10 Records

- NOTE - The performance of this procedure generates no records. However PMIDs associated with the procedure, identified by CHAMPS for the activity, are record material and are maintained in the CHAMPS work package as record material.
- The identified record custodian is responsible for record management in accordance with TFC-BSM-IRM_DC-C-02 or other applicable requirements.

Type	Document No.	Rev/Mod	Release Date	Page
CONTINUOUS	5-LCD-300	G-8	04/11/2008	25 of 28

Table 1 - Gauges with Flow-Tek Ball Valves

A-103	SY-101 R-1C
A-104	T-103
A-106	T-105
A-302-A	T-106
AN-101	T-108
AW-102	T-110
AW-103	T-111
AW-104	T-112
AW-105	TX-101
AW-106	TX-102
AX-102	TX-103
AX-104	TX-104
AY-101	TX-105
AY-102	TX-106
BX-101	TX-107
BX-102	TX-108
BX-103	TX-109
BX-104	TX-110
BX-105	TX-111
BX-107	TX-112
BX-108	TX-113
BX-109	TX-114
BX-110	TX-115
BX-111	TX-116
BX-112	TX-117
BY-103	TX-118
BY-110	TX-302-C
BY-111	TY-101
C-105	TY-102
C-106	TY-103
C-107	TY-104
S-102	TY-105
S-105	TY-106
S-108	U-108
S-109	U-110
S-110	U-111
S-112	U-203
S-302	U-204
SX-101	UX-302-A
SX-102	U-301
SX-103	
SX-104	

Figure 1 - Laptop/Desktop Setup Schematic

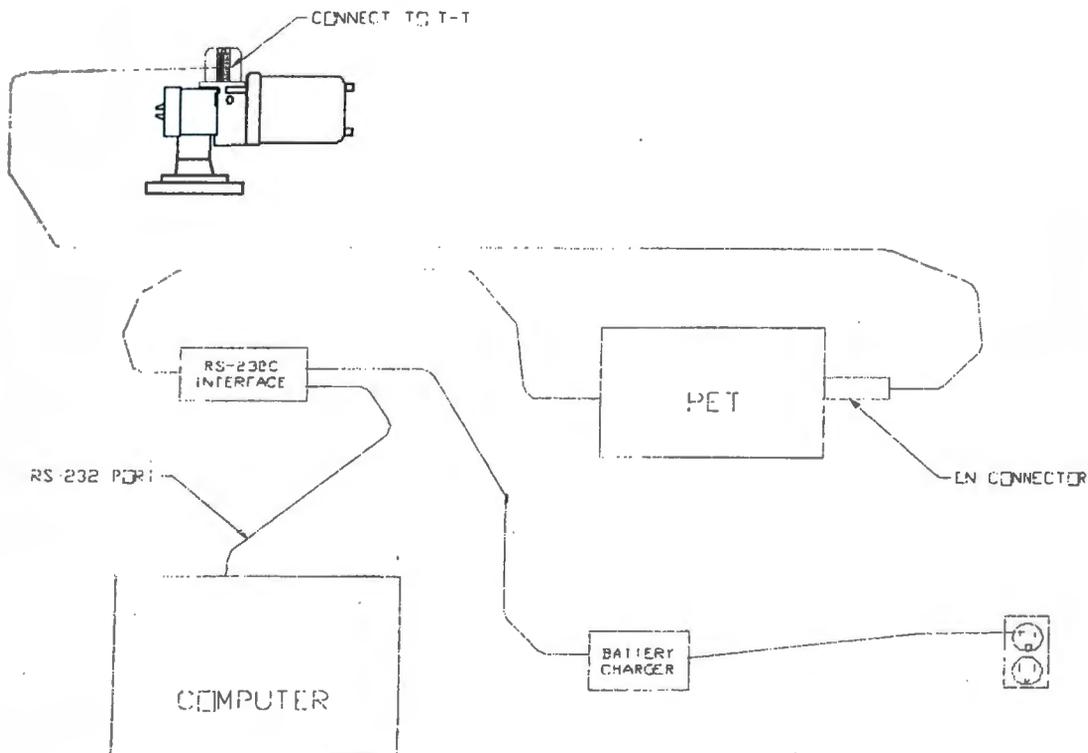
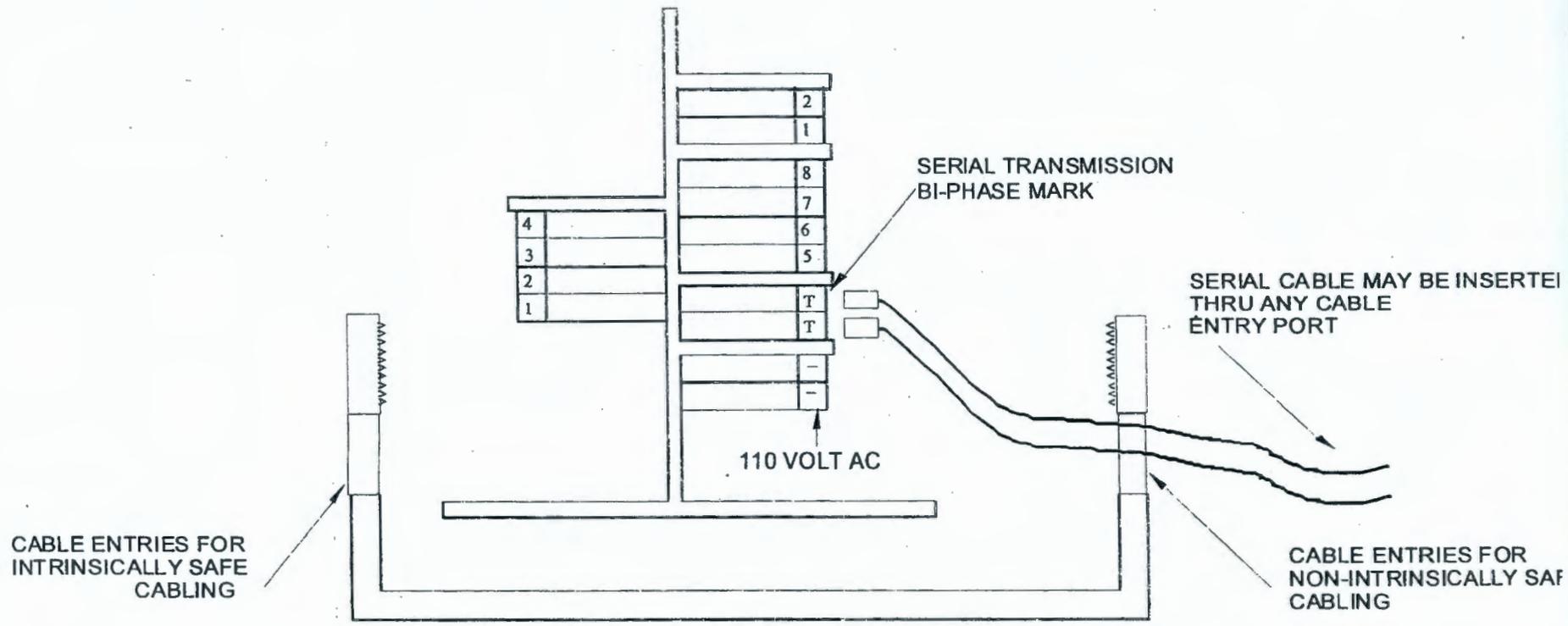


Figure 2 - ENRAF Terminal Compartment Serial Connection





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ENRAF Series 854 Initial Installation and Operational Check

PCA Incorporated:	TF-GC-2006-001	
Procedure Signatures for:	5-LCD-125, G-3	
Type of Change:	PCA	
Review Designator:	N/A	
USQ Screening Number:	TF-06-0871-S, Rev. 0	
POSITION/ORG	DELEGATE	DATE
Technical Writer	<u>L. Coleman</u>	<u>08/07/2006</u>
Approval Authority	<u>K. O. Smith</u>	<u>08/03/2006</u>
Justification:		
TF-SJHA-0001 no longer used.		
Summary of Changes:		
Removed reference to TF-SJHA-0001 from document by global change process.		

Next Periodic Review Date -- 04/13/2009

The following organizations have determined their need to review this procedure at next periodic review cycle: Technical Authority, Environmental and Radiological Control.

Table of Contents	Page
1.0 PURPOSE AND SCOPE.....	4
1.1 Purpose.....	4
1.2 Scope.....	4
2.0 INFORMATION.....	4
2.1 Terms and Definitions.....	4
3.0 PRECAUTIONS AND LIMITATIONS.....	4
3.1 Personnel Safety.....	4
3.2 Equipment Safety.....	5
3.3 Radiation and Contamination Control	5
3.4 Environmental Compliance	5
3.5 Limits.....	6
4.0 PREREQUISITES	6
4.1 Special Tools, Equipment, and Supplies.....	6
4.2 Performance Documents.....	6
4.3 Field Preparation.....	7
5.0 PROCEDURE.....	8
5.1 Initial Installation of Drum and Displacer	8
5.2 Drum Circumference Check	11
5.3 Displacer Weight Check	12
5.4 Calibration Check	14
5.5 Restoration	17
5.6 Acceptance Criteria.....	17
5.7 Review	17
Calibration Data Sheet.....	18
Figure 1 - Motor Lock.....	19
Figure 2 - Motor Unlock.....	20
Figure 3 - Side View of ENRAF 854 Level Gauge	21

Figure 4 - Installing Security Wire..... 22

Type	Document No.	Rev/Mod	Release Date	Page
CONTINUOUS	5-LCD-125	G-3	08/07/2006	3 of 22

1.0 PURPOSE AND SCOPE

1.1 Purpose

This procedure provides post installation calibration/initial settings of the ENRAF Model 854 Displacer Type Level Gauge and instructions for initial installation of the drum and displacer.

1.2 Scope

This procedure applies to post installation calibration/initial settings of the ENRAF Model 854 level gauges and initial installation of the drum and displacer. The test will verify that the gauge has been set up and calibrated according to the manufacturer's instructions.

2.0 INFORMATION

2.1 Terms and Definitions

PET - Portable ENRAF Terminal.

3.0 PRECAUTIONS AND LIMITATIONS

3.1 Personnel Safety

- 3.1.1 If an energized work permit is required during the performance of this procedure, comply with TFC-ESHQ-S-STD-O3 Electrical Safety.
- 3.1.2 If a lock and tag is required during the performance of this procedure, comply with TFC-OPS-OPER-C-05 Lockout/Tagout Program
- 3.1.3 An open isolation valve indicates the ENRAF internals are exposed to the tank environment which could result in Radiological and/or Flammable Gas hazards.

3.2 Equipment Safety

- 3.2.1 Slight bends in the wire are acceptable but a kink could cause the wire to break.
- 3.2.2 Never tighten the compartment cover before the threads are properly engaged. Keep threads free from dirt, failure to do so could damage the threads.
- 3.2.3 When closing, the covers should be turned counterclockwise until the threads click into place, failure to do so could damage the cover.
- 3.2.4 Make sure displacer is still resting on the ball valve before issuing command AR or calibration errors will occur.

3.3 Radiation and Contamination Control

Work in radiological areas will be performed using a radiation work permit following review by Radiological Control per the ALARA Work Planning Procedure TFC-ESHQ-RP_RWP-C-03.

3.4 Environmental Compliance

- 3.4.1 Per Pollution Control Hearing Board Settlement Agreement primary leak detection for double shell tanks shall consist of three operable annulus leak detector probes and one operable in-tank level instrument. Annulus continuous air monitors will supplement the primary leak detection.
- 3.4.2 If leak detection equipment failure occurs, a maintenance outage, or in the event that leak detection equipment preventive maintenance or functional testing that will exceed 24 hours downtime, **NOTIFY** Environmental per Environmental on-call list in accordance with TFC-ESHQ-ENV_FS-C-01.
- 3.4.3 If waste is generated during the performance of this procedure, dispose of it in accordance with TO-100-052, Perform Waste Generation, Segregation, and Accumulation

3.5 Limits

HNF-IP-1266, Tank Farms Operations Administrative Controls

AC 5.10 Flammable Gas Controls

4.0 PREREQUISITES

4.1 Special Tools, Equipment, and Supplies

The following supplies may be needed to perform this procedure:

- Calibration unit - Portable ENRAF Terminal Model No. 847
- Replacement gaskets for sight glass window assembly (if required)
- $\frac{5}{16}$ " Allen wrench
- 3 mm Allen tee-handle wrench
- Small screwdriver
- Shop stock wire from ENRAF (\cong 12" length)
- Tape.

4.2 Performance Documents

The following procedures may be needed to perform this procedure:

- TO-040-180, Operate Tank Surface Level Monitoring Devices

4.3 Field Preparation

- 4.3.1 IF the gauge is connected to TMACS, ENSURE the system operators has been notified (i.e. 373-2618) of intent to perform this procedure.
- 4.3.2 FWS OBTAIN correct RL (reference level) value from Engineering Change Notice (ECN) AND RECORD on page 18, Calibration Data Sheet, item "T".
- 4.3.3 CONFIRM that the portable ENRAF terminal powers up.
- 4.3.4 ENSURE release from Shift Manager has been OBTAINED, prior to beginning performance of this procedure.
- 4.3.5 ENSURE applicable lock and tag, authorized worker tag or Energized Work Permit requirements have been satisfied.

5.0 PROCEDURE

NOTE - This procedure contains a Calibration Data Sheet which may be copied if this procedure is to be performed multiple times.

- If performance of any steps in this procedure is not required for procedure completion, steps not performed must be indicated as such by entering "N/A" in appropriate data sheet signoff space and explained in COMMENTS/REMARKS section of Data Sheet, if applicable.

5.1 Initial Installation of Drum and Displacer

WARNING

An open isolation valve indicates the ENRAF internals are exposed to the tank environment which could result in Radiological and/or Flammable Gas hazards.

- 5.1.1 **ENSURE** by visual inspection that the isolation valve is **SECURED** in the closed position.
- 5.1.2 **IF** isolation valve is **NOT** in the closed position, **STOP WORK AND NOTIFY FWS.**
- 5.1.3 **ENSURE** by visual inspection that the power switch is in the "OFF" position, or receptacle plug is "disconnected".
- 5.1.4 **REMOVE** the electronic compartment cover.
- 5.1.5 **ENSURE** by visual inspection that the "motor lock," located at the bottom left corner of the electronic compartment, is in the locked position (Figure 1 - Motor Lock).
- 5.1.6 **CONFIRM** by visual inspection that approximately the first 4 feet of wire on the drum to be installed are free of kinks, **AND**

RECORD on Calibration Data Sheet (item A).

5.1 Initial Installation of Drum and Displacer (Cont.)

- 5.1.7 **RECORD** drum circumference value engraved on wire drum on the Calibration Data Sheet (item C).
- 5.1.8 **RECORD** the displacer weight shown/tagged on the displacer as the New Displacer Weight on the Calibration Data Sheet (item D).

CAUTION

Slight bends in the wire are acceptable but a kink could cause the wire to break.

- 5.1.9 **IF** during installation of the drum or displacer, the wire becomes kinked, **CONTACT** Engineering for direction.
- 5.1.10 **REMOVE** the drum compartment cover from the gauge.
- 5.1.11 **REMOVE** the sight glass cover.
- 5.1.12 **REMOVE** rubber band or tape from drum.
- 5.1.13 **WHILE INSERTING** the drum into its bearings, **FEED** wire and mounting snap from reel housing to sight glass opening **WHILE MAINTAINING** tension on reel.
- 5.1.14 **IF** displacer has factory hook, **PULL** wire through sight glass window, **AND** **CONNECT** displacer to the wire.
- 5.1.14.1 **USING** a piece of wire ($\cong 12''$ length), **WRAP** one end around the measuring wire as shown in Figure 4.
- 5.1.14.2 **PASS** other end of wire through hole in tip of displacer hook. **AND** **WRAP** wire several times around hook and through hole to secure the displacer (see Figure 4).
- 5.1.15 **IF** displacer has eye-hook, **PULL** the mounting snap through the sight glass window.

5.1 Initial Installation of Drum and Displacer (Cont.)

5.1.15.1 **CONNECT** displacer to the snap, **AND**

VISUALLY ENSURE displacer connection.

5.1.16 **PLACE** the displacer through the sight glass by placing the bottom end in first while holding the wire with other hand or other mechanical means (i.e., tongs or wire hook).

5.1.17 **CONTINUE** lowering the displacer into the sight glass until it is suspended from the gauge.

5.1.18 **CHECK** the axial free-play by performing the following substeps:

5.1.18.1 **PUSH** the drum towards the magnet cap in such a way that the drum shaft meets the magnet cap.

5.1.18.2 **SLIGHTLY MOVE** the drum in and out, **WHILE CHECKING** that the drum and drum shaft are free to move towards you.

5.1.18.3 **ENSURE** the drum is in contact with the magnetic cap.

CAUTION

Never tighten compartment cover before threads are properly engaged. Keep threads free from dirt, failure to do so could damage the threads.

When closing, the covers should be turned counterclockwise until the threads click into place, failure to do so could damage the cover.

5.1.19 **UNLOCK** the "motor lock" located at the bottom left corner of the electronic compartment (Figure 2 - Motor Unlock).

5.1.20 **REPLACE** all covers (sight glass, electronic compartment, and drum compartment).

5.2 Drum Circumference Check

5.2.1 IF not already, **CONNECT** portable ENRAF terminal to gauge to be tested by plugging the terminal's optical coupler into the socket located on the left side of the gauge when facing the display, **AND**

PRESS the ON/RESET button.

NOTE - In the event the gauge is not yet connected to permanent power, the word "SWITCH power ON/OFF to gauge" shall be taken to mean "Plug in gauge."

5.2.2 IF power is OFF, **SWITCH** power ON to gauge.

5.2.3 **ENTER** Command [DC]. (This command displays the programmed drum circumference).

NOTE - The portable ENRAF terminal displays the drum circumference in scientific notation, which is different from the format engraved on the drum. The value displayed by the portable ENRAF terminal will look like: "DC=+.33000000E+00". The units here are meters, whereas the drum value is given in millimeters. The same value on the drum would look like: "330.0000".

5.2.4 **CHECK** that programmed drum circumference value matches value for drum circumference found engraved on wire drum (item C), **AND**

IF value docs match, **RECORD** [DC] programmed drum circumference (As-Left Programmed Value) on Data Sheet (item B), **AND GO TO** Section 5.3.

5.2.4.1 **ENTER** Command [W2=ENRAF2]. (This command enters protection level 2).

5.2.4.2 **ENTER** Command [DC=+.xxxxxxxE+00], where xxxxxxxx is the value engraved on the wire drum. (i.e., DC=+.32703900E+00).

5.2.4.3 **RECORD** [DC] as the programmed drum circumference (As-Left Programmed Value) on the Calibration Data Sheet (item B).

5.2.4.4 **ENTER** Command [EX]. (This commands exits protection level 2).

5.3 Displacer Weight Check

NOTE - The displacer must be at least 8 inches below the upper adaptor flange before performing this section.

- 5.3.1 **ENTER** Command = [UN]. (This command returns the gauge to the operational mode. The displacer will rest on the closed ball valve).
- 5.3.2 **WAIT** until gauge stabilizes.
- 5.3.3 **ENTER** Command = [CA]. (This command raises the displacer).
- 5.3.4 **WAIT** a few seconds to allow displacer to rise a couple of inches.
- 5.3.5 **ENTER** Command = [FR]. (This command freezes the motion of the displacer).
- 5.3.6 **ENTER** Command = [MF]. (This command measures the frequency of the transducer).
- 5.3.7 **WAIT** for "FR" to appear in the display.
- 5.3.8 **ENTER** Command = [WQ]. (This command displays the as-found displacer weight).
- 5.3.9 **RECORD** the as-found displacer weight on Calibration Data Sheet (item E).
- NOTE - A WQ value that is within tolerance will verify that the force transducer is still within calibration.
- 5.3.10 **CONFIRM** that the difference between the weight recorded in Step 5.1.8 (item D) and the [WQ] weight (item E) is within ± 6 grams.
- 5.3.11 **IF** difference verified in step 5.3.10 is within tolerance **RECORD** on Calibration Data Sheet (item F),

OR

IF difference verified in step 5.3.10 is **NOT** within tolerance **RECORD** on Calibration Data Sheet (item F), **AND**

CONTACT Engineering.

5.3 Displacer Weight Check (Cont.)

5.3.12 **ENTER** Command = [DW], **AND**

RECORD on Calibration Data Sheet (item G). (This command displays the programmed displacer weight).

5.3.13 **IF** [WQ] does not match [DW] to within ± 6 grams **CONTACT** Engineering, **AND**

PROCEED as directed.

5.3.14 **IF** [WQ] matches [DW] to within ± 6 grams, **PERFORM** the following steps:

5.3.14.1 **ENTER** Command [W2=ENRAF2]. (This command enters protection level 2).

5.3.14.2 **ENTER** Command [DW=+.xxxxxxxE+03] where .xxxxxxx is the [WQ] value recorded above.

5.3.15 **SUBTRACT** 15 grams from the as-found value of [WQ], **AND**

RECORD this value as [S1], [S3] and [RM] on Calibration Data Sheet (item H).

5.3.16 **ENTER** Command [S1=+.xxxxxxxE+03], where .xxxxxxx is the [S1] value recorded above.

5.3.17 **REPEAT** step 5.3.16 for [S3] and [RM].

5.3.18 **ENTER** Command [S2=+.05000000E+03].

5.3.19 **ENTER** Command = [EX]. (This command exits protection level 2).

5.4 Calibration Check

- 5.4.1 **ENTER** Command = [UN]. (This command will return the gauge to operational mode. The displacer will rest on the closed ball valve).
- 5.4.2 **WAIT** for level reading to stabilize.
- 5.4.3 **ENSURE** RL value obtained in Step 4.3.2 has been entered as the correct RL value on the Calibration Data Sheet (item I).
- 5.4.4 **PERFORM** reference level entry as required.

5.4.4.1 **ENTER** Command = [W2=ENRAF2]. (This command enters protection level 2).

5.4.4.2 **ENTER** Command = [RL=+XXXXX.XX], where XXXXX.XX is the correct RL value, **AND**

RECORD as programmed RL value on the Calibration Data Sheet (item J).

CAUTION

Make sure displacer is still resting on the ball valve before issuing command AR or calibration errors will occur.

5.4.4.3 **ENTER** Command = [AR]. (This command authorizes the gauges to accept the corrected value for "RL").

5.4.4.4 **ENTER** Command = [EX]. (This command exits protection level 2).

5.4.4.5 **WAIT** until the level reading stops changing, **AND**

RECORD as the As Left RL Reading (item K).

5.4.4.6 **IF** reference level cannot be achieved to ± 0.10 inch for level gauge **CONTACT** Engineering, **AND**

PROCEED as directed.

5.4 Calibration Check (Cont.)

- 5.4.5 **ENTER** Command = [CA]. (This command raises the displacer to the ENRAF adapter flange).
- 5.4.6 **CHECK** by visual inspection that the displacer can be seen through the sight glass.
- 5.4.7 **WHEN** the displacer reaches the ENRAF adapter flange and stops, **PERFORM** the following:
- 5.4.7.1 **RECORD** the level reading displayed on the gauge as the as-found TT on Calibration Data Sheet (item L).
- 5.4.7.2 **ENTER** Command = [W2=ENRAF2]. (This command enters protection level 2).
- 5.4.7.3 **ENTER** Command = [TT+=XXXXX.XX], where +XXXXX.XX is the level reading when the displacer is at the ENRAF adapter flange, **AND**
- RECORD** as programmed TT on the Calibration Data Sheet (item M).
- 5.4.7.4 **RECORD** the level displayed on the gauge as the as-left TT on the Calibration Data Sheet (item N).
- 5.4.7.5 **ENTER** Command [EX]. (This commands exits protection level 2).
- 5.4.7.6 **ENTER** command [UN] to lower the displacer 6 to 10 inches before proceeding to the next step.
- 5.4.8 **ENTER** Command = [FR]. (This command freezes the motion of the displacer).
- 5.4.9 **OPEN** the isolation valve, **AND SECURE** it.
- 5.4.10 **ENTER** Command = [UN]. (This command returns the gauge to the operational mode).

5.4 Calibration Check (Cont.)

- 5.4.11 IF the displacer gets caught up either on the PVC flange or on an undersized neoprene gasket, **PERFORM** the following sub-steps.
- 5.4.11.1 **ENTER** W2 protection mode.
- 5.4.11.2 **CHANGE** setpoint (S2) to 50 grams (if not already 50 grams) **USING** standard command entry format.
- 5.4.11.3 **EXIT** W2 protection mode.
- 5.4.11.4 **ENTER** command [I2].
- 5.4.11.5 **USE** the [CA] and [UN] commands to get passed the obstruction.
- 5.4.11.6 **WHEN** the displacer is passed the obstruction, **ENTER** command [I1] to return to normal operation.
- 5.4.12 **WAIT** until the level reading stops changing.
- 5.4.13 **RECORD** the as-left tank liquid level reading on Calibration Data Sheet (item O).
- 5.4.14 **ENTER** command = [MH]. (This is the Motor High limit setting. The travel speed of the displacer is slower when above this setting).
- 5.4.15 **CHECK** that the Motor High setting is equivalent to the Correct RL value plus 15 inches, ± 1 inch.
- 5.4.16 IF the Motor High setting is NOT correct perform the following substeps, **OTHERWISE, GO TO** Section 5.5.
- 5.4.16.1 **ENTER** command = [W2=ENRAF2].
- 5.4.16.2 **ENTER** command = [MH=+xxxxx.xx], where xxxxx.xx equals the Correct RL value plus 15 inches.
- 5.4.16.3 **ENTER** command = [EX].

5.5 Restoration

- 5.5.1 **ENSURE** all test equipment has been disconnected and removed.
- 5.5.2 **ENSURE** measuring and test equipment (M&TE) and calibration status are recorded on Data Sheet.
- 5.5.3 **ENSURE** instrument enclosure cover is properly reinstalled.
- 5.5.4 **ENSURE** equipment system restoration by observing indications are consistent with expected conditions.

5.6 Acceptance Criteria

Comparison and verification that data in applicable steps of procedure are within limits (tolerance) of Data Sheet(s) satisfies Acceptance Criteria for this procedure.

5.7 Review

- 5.7.1 **INFORM** Shift Manager and FWS the test is complete.
- 5.7.2 The FWS **REVIEW AND ENSURE** the following:
- Completed Data Sheets meet the acceptance criteria.
 - Comments sections are filled out appropriately.
 - Work requests needed as a result of this procedure are identified and generated.
 - Work request number(s) of any work documents generated as a result of this procedure, are recorded in the Comments/Remarks section of the Data Sheet, as applicable.
- 5.7.3 **FORWARD** copies of all data sheets to Engineering.

Calibration Data Sheet

INSTRUMENT TAG NO.: _____		LOCATION: _____
DESCRIPTION: <u>LEVEL GAUGE</u>		MODEL NO.: <u>SERIES 854 ATG</u>
MANUFACTURER: <u>ENRAF INC.</u>		WORK ORDER NO.: _____
CALIBRATION SOURCE/MODEL NO.: <u>PORTABLE ENRAF TERMINAL /</u>		
SERIAL NO./DATE TESTED: _____ / _____		
DESCRIPTION	ITEM	DATA
No-Kink Verification	(item A)	Craft Signature/Date: _____
Drum Circumference	(item B)	As-Left Programmed Value: _____
	(item C)	Engraved Value: _____
Displacer Weight	(item D)	New Displacer Wt. (Tagged) _____
	(item E)	As-Found Displ. Wt. (WQ): _____
	(item F)	WQ within ± 6 grams of item D: Yes ___ No ___
	(item G)	Prog. Displ. Wt. (DW): _____
	(item H)	S1 = S3 = RM = _____
Calibration	(item I)	Correct RL Value: _____
	(item J)	Programmed RL Value: _____
	(item K)	As Left RL Reading: _____
	(item L)	As Found TT Reading: _____
	(item M)	As Programmed TT: _____
	(item N)	As Left TT: _____
Tank Level	(item O)	As Left Tank Liquid Level: _____
REMARKS:		

Craft Signature/ Date: _____

Figure 1 - Motor Lock

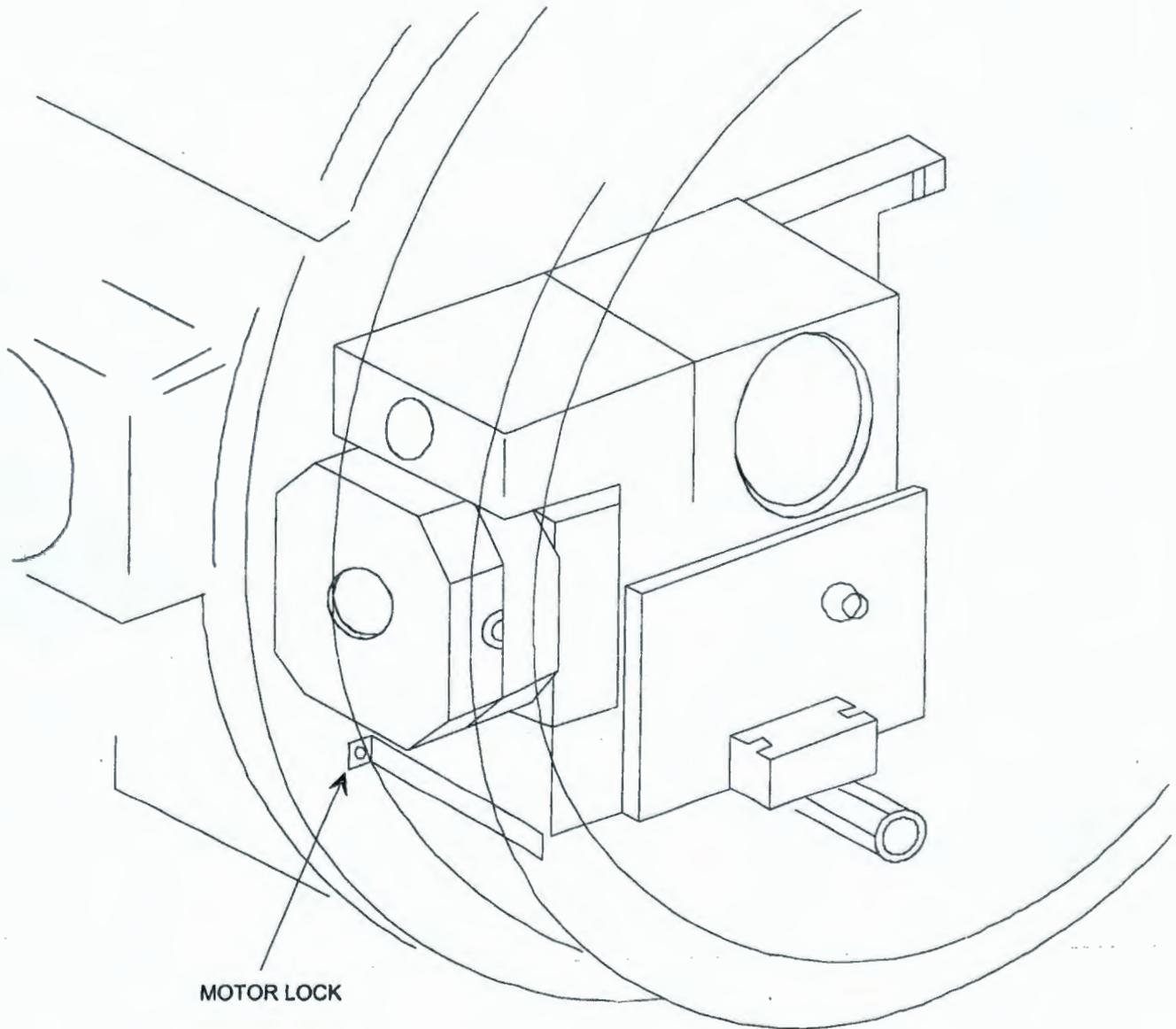


Figure 2 - Motor Unlock

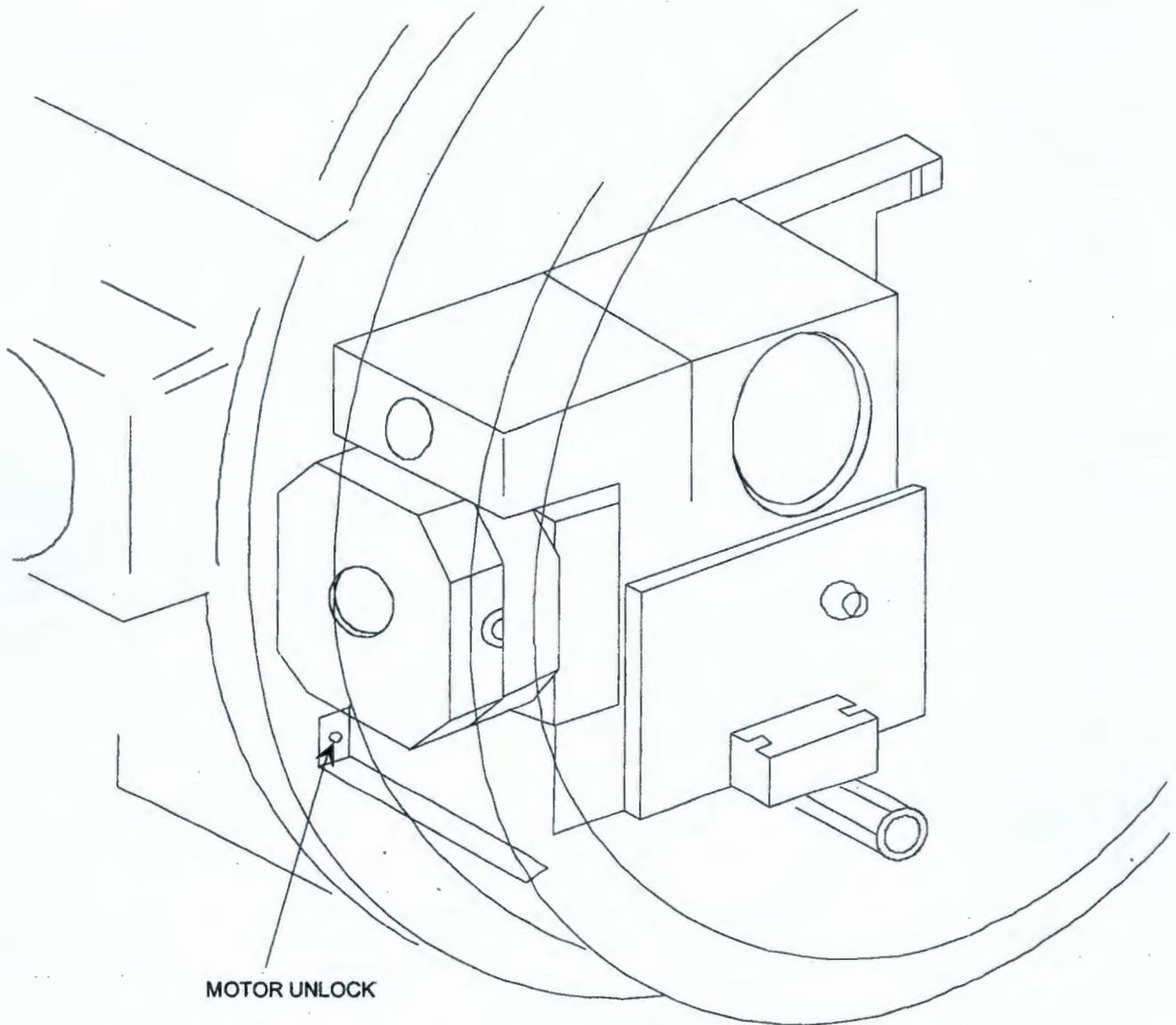


Figure 3 – Side View of ENRAF 854 Level Gauge

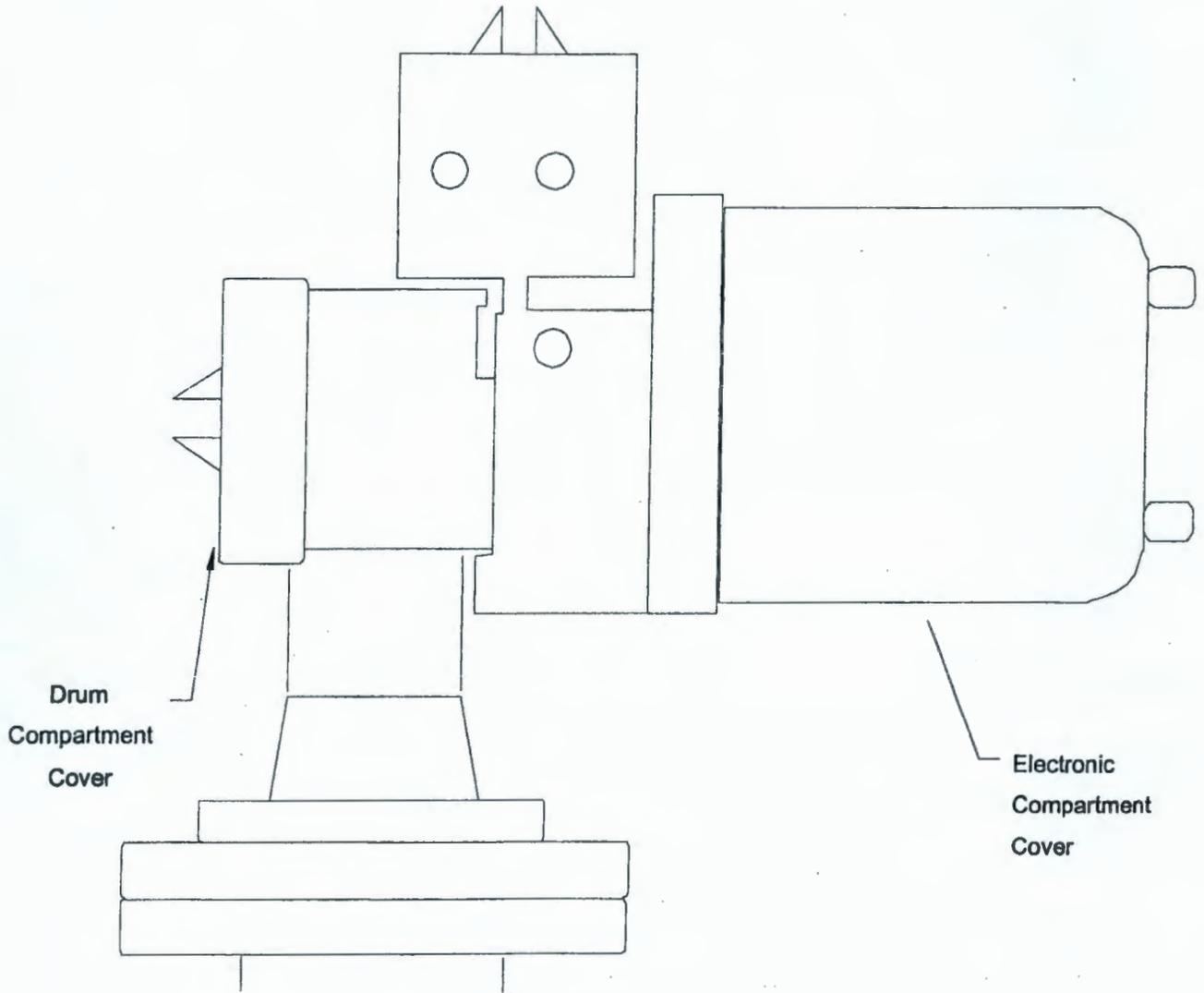
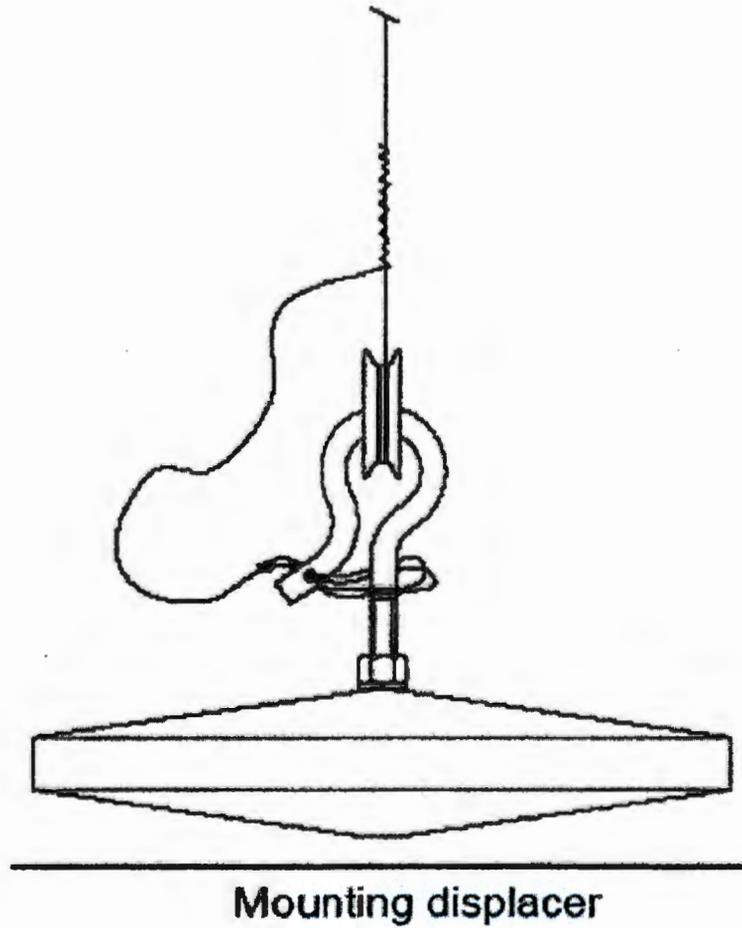


Figure 4 – Installing Security Wire



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WORKING COPY

T S R Compliance

Tank Farm Maintenance Procedure

MAINTENANCE



Double click to change COPY type

Radial HEPA Filter Installation, Removal, & Replacement

PCA Incorporated: CO-2007-0111
 Procedure Signatures for: 5-VT-710, A-7
 Type of Change: PCA
 Review Designator: N/A
 USQ Screening Number: N/A

POSITION/ORG	DELEGATE	DATE
Millwright	<u>Albert Delapaz</u>	<u>09/12/2007</u>
Maintenance/FWS	<u>James M. Hay</u>	<u>09/12/2007</u>
SM/CO	<u>Rajiv Malhan</u>	<u>09/12/2007</u>
System Engineer/CO	<u>G. J. Gauck</u>	<u>09/12/2007</u>
Technical Writer	<u>M. D. Cost</u>	<u>09/13/2007</u>
Approval Authority	<u>J. J. Klos</u>	<u>09/13/2007</u>

Justification:

Operations request to modify Data Sheet 2 and Data Sheet 3

Summary of Changes:

Removed unnecessary step column, no longer required during job radiological survey number rows from Data Sheet 2, and removed step cross reference in Data Sheet 3.

Next Periodic Review Date — 04/11/2008

The following organization(s) have determined their need to review this procedure at the next periodic review cycle: Technical Authority, Safety, Environmental, and Radiological Control.

INFORMATION ONLY

Table of Contents

Page

1.0	PURPOSE AND SCOPE.....	3
1.1	Purpose.....	3
1.2	Scope.....	3
2.0	INFORMATION.....	3
3.0	PRECAUTIONS AND LIMITATIONS.....	4
3.1	Personnel Safety.....	4
3.2	Equipment Safety.....	4
3.3	Radiation and Contamination Control	4
3.4	Environmental Compliance	5
3.5	Limits	6
4.0	PREREQUISITES	7
4.1	Special Tools, Equipment, and Supplies.....	7
4.2	Filter Performance Documents	7
4.3	Field Preparation.....	7
5.0	PROCEDURE.....	8
5.1	Pre-Installation Filter QC Inspection and Data Recording.....	8
5.2	Remove Old Filter(s)	9
5.3	Install New Filter(s)	13
5.4	Restoration	15
5.5	Acceptance Criteria.....	15
5.6	Review	15
	Data Sheet 1 - QC Inspection Data	16
	Data Sheet 2 – Daily Survey Data	17
	Data Sheet 3 - Filter Installation Data.....	18
	Data Sheet 4 – FWS/Engineering/Environmental Review	19
	Comment Page.....	20
	Figure 1 – Flanders Filter Bag-In/Bag-Out Components	21

1.0 PURPOSE AND SCOPE

1.1 Purpose

This procedure provides instructions for removal, installation, and disposal of Radial breather filter on Breather Filter assembly/riser at 241-AZ154, 241-U-301-B, 241-UX-302-A, 244-A catch tank, 244-A catch tank annulus space, 241-ER-311 and the 149 Single Shell Tanks stated in the Radioactive Air Emissions Notice of Construction for Categorical Tank Farm Facility Waste Retrieval and Closure: Phase I Site preparation and system installation.

1.2 Scope

This procedure involves filters installed Breather Filter assemblies/risers.

This procedure may be used for installation or replacement of Radial filter(s).

Installation of filter(s) on:

- New Breather Filter assemblies
- New Breather Filter assembly housings

Replacement of filter(s) on:

- Existing Breather Filter assemblies
- Existing Breather Filter assembly housings.

2.0 INFORMATION

NONE

3.0 PRECAUTIONS AND LIMITATIONS

3.1 Personnel Safety

WARNING - Removed material should be treated as contaminated. Failure to do so may result in personnel contamination.

3.1.1 When handling potentially mercury (Hg) contaminated material, use silver shield PPE.

3.2 Equipment Safety

CAUTION - Too much twisting torque on the filter mesh material could cause it to crinkle and possibly puncture the filter material.

CAUTION - Cross-threading of filter threads may result in equipment failure.

3.3 Radiation and Contamination Control

3.3.1 Work in radiological areas will be performed using a radiological work permit following review by Radiological Control per ALARA Work Planning procedure TFC-ESHQ-RP_RWP-C-03.

3.3.2 The opening of any system or component within a Radiological Area requires the presence of a Health Physics Technician to verify radiological conditions are within RWP limits.

3.3.3 All removed materials, liquids, spent cleaning materials and used filter(s) should be treated as contaminated until proven non-contaminated by radiological survey.

3.3.4 All materials are to be managed in accordance with Waste Planning Checklist and TO-100-052.

3.4 Environmental Compliance

3.4.1 Ensure Waste Planning Checklist is included in work package.

3.4.2 The following document has been referenced during the review of this procedure and controls have been verified to be incorporated:

- Radioactive Air Emissions Notice of Construction for Installation and Operation of Breather Filter on Tanks 241-AZ154, 241-U-301-B, 244-A, and 241-UX-302-A.
- Radioactive Air Emissions Notice of Construction for Categorical Tank Farm Facility Waste Retrieval and Closure: Phase I Site preparation and system installation.

NOTE - The ALARACT demonstrations are DOE-RL and Washington State Department of Health approved Control Technology Demonstrations.

3.4.3 The following controls specified in FF-01 "Hanford Site Radioactive Air Emission License" ALARACT Demonstrations are applicable to Radial breather filter removal, installation, and disposal:

- ALARACT 1, Tank Farm ALARACT Demonstration for Riser Preparation/Opening
- ALARACT 4, Tank Farm ALARACT Demonstration for Packaging and Transportation of Waste
- ALARACT 12, Tank Farm ALARACT Demonstration for Packaging and Transportation of Equipment and Vehicles
- ALARACT 13, Tank Farm ALARACT Demonstration for Installation, Operation, and Removal of Tank Equipment
- ALARACT 15, Tank Farm ALARACT Demonstration for Size Reduction of Waste Equipment for Disposal
- ALARACT 16, Tank Farm Demonstration for Work on Potentially Contaminated Ventilation System Components.

3.4.4 Do not breach a radioactive system if sustained winds are greater than 25 mph. A local wind speed measurement device may be utilized in lieu of Hanford Meteorological Stations readings, provided the reading is taken in an unobstructed location that is representative of the work area. Use of a local device and the measured wind speed reading taken from it must be documented in the Work Record (ALARACT 13).

3.4 Environmental Compliance (Cont.)

- 3.4.5 During removal and/or installation of equipment from tanks, risers and pits, swipes will be taken to determine that the surface of the item or the outermost surface of the container are maintained $<50,000$ dpm/100 cm² beta-gamma and/or <70 dpm/100 cm² alpha (ALARACT 13).
- 3.4.6 Equipment is to be decontaminated or contained when removed from tanks (ALARACT 13).
- 3.4.7 Minimize open riser time.
- 3.4.8 Tank Farm Contractor (TFC) Environmental representative and Tank Farm Shift Operations Facility shall be notified in accordance with TFC-ESHQ-ENV_FS-C-01, Environmental Notifications if:
- The initial field count of an air sample with beta-gamma activity is greater than 0.1 Derived Air Concentration (DAC) and/or
 - The initial field count of an air sample with total alpha activity is greater than 5.0 DAC and/or
 - Results of 7-day decay count of air samples with a total alpha activity is greater than 0.1 DAC.

Elevated workspace air samples that are suspected to be radon or its daughter products are to be reported to the Environmental On-Call list within 24 hours of field count if radon is NOT confirmed. If the sample decay rate is indicative of radon, whether or not the sample remains above 5 DAC alpha within the 24 hour verification period, notification to the Environmental On-Call list is NOT required. If the decay rate is not indicative of radon, the Environmental On-Call person MUST be notified.

3.5 Limits

HNF-SD-WM-TSR-006, Tank Farms Technical Safety Requirements

LCO 3.2.3 SST 241-B-203 and 241-B-204 Passive Ventilation Systems.

RPP-11413, Technical Basis for Ventilation System Requirements

- Ventilation System Operation and Filtration
- Filter(s) Differential Pressure (Active Ventilation)
- HEPA Filter(s) In-Place Leak Testing.

Type	Document No.	Rev/Mod	Release Date	Page
CONTINUOUS	5-VT-710	A-7	09/13/2007	6 of 21

4.0 PREREQUISITES

4.1 Special Tools, Equipment, and Supplies

The following equipment and materials may be needed to perform this procedure:

- Radial HEPA Filters
- Threaded PVC cap for removed Radial breather filter
- Pipe wrench to fit 1 ½ inch pipe
- Non-regulated anti thread galling material (i.e., Gray Teflon Tape)
- Silver Shield PPE for mercury (Hg)
- Waste container
- Other tools, equipment and supplies as identified by Shift Manager/OE/FLM/User.

4.2 Filter Performance Documents

The following documents will be needed to complete this procedure:

- Applicable filter(s) Installation/Replacement Data Sheet
- Additional copies of Data Sheet 1 for each new filter to be installed.

The following documents may be needed during performance this procedure:

- A-6003-180 Temporary Shielding Authorization Form
- TFC-OPS-MAINT-C-02, Pre-Job Briefing
- TO-100-052, Perform Waste Generation, Segregation, and Accumulation
- Waste Planning Checklist.

4.3 Field Preparation

- 4.3.1 **NOTIFY** Quality Control of filter(s) installation/replacement task, for verification and inspection of replacement filter(s).
- 4.3.2 **ENSURE** pre-job safety briefing, including all involved personnel, per TFC-OPS-MAINT-C-02 has been completed.
- 4.3.3 **IF** Radiation Controls Planning has determined temporary shielding is necessary, **ENSURE** a Temporary Shielding Authorization form (A-6003-180) has been completed.

5.0 PROCEDURE

- NOTE - Component numbers are prefixed by various combinations of letters and number to designate the facility where the filter is installed (i.e., "B201-WST-").
- During performance of this procedure, tools, equipment and fittings will be removed from and/or inserted into the filter(s) housing. Such items shall be surveyed for radiological contamination prior to and after insertion/removal.
 - If performance of any section is not necessary, N/A applicable Data Sheets.

5.1 Pre-Installation Filter QC Inspection and Data Recording

NOTE - This section only applies to new filters.

- 5.1.1 Quality Control Representative, **PERFORM** the following Sub-Steps.
- 5.1.1.1 **COMPLETE** inspection per Data Sheet 1.
 - 5.1.1.2 **IF** filter does not pass visual inspection, **REQUEST** System Engineer to identify corrective action(s).
 - 5.1.1.3 **IF** filter passes visual inspection, **INITIAL AND DATE** Data Sheet 1.
- 5.1.2 **DELIVER** filter(s) in its carton and bags to work area.
- 5.1.3 **IF** existing filter is being replaced, **GO TO** Section 5.2 to remove existing filter(s).
- 5.1.4 **IF** no filter is currently installed in housing, **GO TO** Section 5.3 to install new filter(s).

5.2 Remove Old Filter(s)

NOTE - This section applies only to the removal of existing filters. For installation of new filters see Section 5.3.

- Figure 1 shows the typical layout of a Radial breather filter assembly on a riser.

5.2.1 **PERFORM** pre-job contamination and radiation surveys of the work area
AND

RECORD on Data Sheet 2.

5.2.2 **INSTALL** ground cover.

Limits - LCO 3.2.3, SST 241-B-203 and 241-B-204 Passive Ventilation Systems.

5.2.3 **IF** work activity is at B203 and/or B204, **PERFORM** the following:

5.2.3.1 **OBTAIN** representative Headspace flammable gas readings per TF-OPS-IHT-002 or as directed by engineering.

OR

CONFIRM flammable readings are current as required, per LCO 3.2.3

5.2.3.2 **RECORD** representative Headspace flammable gas readings on Data Sheet 3.

5.2.3.3 **INITIAL AND DATE** representative Headspace flammable gas readings on Data Sheet 3.

5.2.3.4 **CONFIRM** headspace flammable gas reading is less than 25% LFL.

5.2.3.5 **IF** headspace flammable gas reading equal to or greater than 25% LFL, **STOP** work, **AND**

CONTACT FWS and Shift Manager.

5.2.4 **IF** flammable gas reading was not taken, **RECORD** in comments section of Data Sheet 3.

5.2 Remove Old Filter(s) (Cont.)

5.2.5 **OBTAIN** Shift Manager Permission to close breather filter isolation valve.

5.2.6 **REQUEST** Shift Manager review LCO 3.2.3 **AND**
PROVIDE permission to proceed with testing.

NOTE - Valve handle is normally positioned 90 degrees from inlet pipe when closed. The closed position is determined by feeling the valve disc interacting with the valve seat.

5.2.7 **REQUEST** Operations personnel to **ENSURE** filter isolation valve is **CLOSED**.

5.2.8 **CONFIRM** filter isolation valve is **CLOSED**.

5.2.9 **DURING** the entire performance of this procedure, **INSPECT** filter assembly per Data Sheet 3 for discrepancies (i.e., bent/rusted, deformation of the housing, fasteners, gaskets, labels, etc.).

5.2.10 **IF** discrepancies are found, **RECORD** discrepancies in comment section on Data Sheet 3.

5.2.11 **START** work place air sampler.

CAUTION

Too much twisting torque on the filter mesh material could cause it to crinkle and possibly puncture the filter material.

5.2.12 **UNSCREW** wing-nut **AND REMOVE** weather cover (keep both for later use).

NOTE - Removing the bird screen from the filter assembly will allow access to the threaded pipe nipple.

5.2.13 **CAREFULLY LIFT** bird screen off filter assembly (keep for later use).

NOTE - A PVC threaded pipe cap can used for additional contamination control and may be optionally used at the discretion of the FWS and HPT.

5.2.14 **IF** requested by FWS or HPT, **STAGE** threaded PVC cap.

5.2 Remove Old Filter(s) (Cont.)

WARNING

Removed material should be treated as contaminated. Failure to do so may result in personnel contamination.

- 5.2.15 USE pipe wrench to loosen Radial breather filter pipe nipple.
- 5.2.16 ENSURE equipment being removed is decontaminated or contained, AND MEETS the following criteria at the outer-most surface of item or container:
- <50,000 dpm/100 cm² beta-gamma
 - <70 dpm/100 cm² alpha.
- 5.2.17 CAREFULLY UNSCREW contaminated Radial breather filter.
- 5.2.17.1 UNTIL radiological conditions have been confirmed, CONTROL breached opening with a wet rag.
- 5.2.17.2 REQUEST HPT to perform contamination survey of filter connection area, AND CONFIRM levels are within RWP limits.
- 5.2.18 IF requested by FWS or HPT, THREAD PVC cap onto removed Radial breather filter.
- 5.2.19 PLACE filter in bag.
- 5.2.20 SEAL bag with Radial breather filter inside in accordance with Waste Planning Checklist and TO-100-052.
- 5.2.21 ENSURE exterior contamination levels of bag are within RWP limits.
- 5.2.21.1 IF contamination levels of bag exterior are >50,000 dpm/100 cm² beta-gamma or >70 dpm/100 cm² alpha, PLACE into another bag (double bag).
- 5.2.22 DISPOSE of filter(s) in accordance with Waste Planning Checklist and TO-100-052.

5.2 Remove Old Filter(s) (Cont.)

5.2.23 **DURING** the entire performance of this procedure, **INSPECT** filter assembly per Data Sheet 3 for discrepancies (i.e., bent/rusted, deformation of the housing, fasteners, gaskets, labels, etc.).

5.2.24 **IF** discrepancies are found, **PERFORM** the following:

5.2.24.1 **COVER** riser opening.

5.2.24.2 **RECORD** discrepancies in comment section on Data Sheet 3.

5.3 Install New Filter(s)

NOTE – This Section only applies to new filter installations. For removal of existing filter(s) see Section 5.2.

5.3.1 **ENSURE** Section 5.1 has been completed.

5.3.2 **ENSURE** the following items are available:

- New Filter
- Weather cover (new or saved from Step 5.2.12)
- Wing nut (new or saved from Step 5.2.12)
- Bird Screen (new or saved from Step 5.2.13).

5.3.3 **ENSURE** pre-job contamination and radiation surveys have been performed and is recorded on Data Sheet 2.

5.3.4 **ENSURE** ground cover is installed.

5.3.5 **DURING** the entire performance of this procedure, **INSPECT** filter assembly per Data Sheet 3 for discrepancies (i.e., bent/rusted, deformation of the housing, fasteners, gaskets, labels, etc.).

5.3.6 **IF** discrepancies are found, **RECORD** discrepancies in comment section on Data Sheet 3.

5.3.7 **ENSURE** work place air sampler is operating.

5.3.8 **PERFORM** radiation & contamination survey of housing interior, and exterior, and bird screen,

5.3.9 **DECONTAMINATE** surfaces as needed to <10,000 dpm/100 cm² Beta-Gamma and <20 dpm/100 cm² Alpha.

5.3 Install New Filter(s) (Cont.)

NOTE - See Figure 1 for filter replacement sketch.

5.3.10 **ENSURE** anti-galling material is applied to filter threads (i.e., Gray Teflon Tape).

CAUTION

Cross-threading of filter threads may result in equipment failure.

5.3.11 **USE** caution to ensure filter threads do not become cross-threaded, **AND CAREFULLY INSTALL** new Radial breather filter to hand-tightness.

5.3.12 **USE** pipe wrench **AND TIGHTEN** Radial breather filter pipe nipple.

5.3.13 **PERFORM** radiation & contamination survey of housing interior and exterior.

5.3.14 **DECONTAMINATE** surfaces as needed to <10,000 dpm/100 cm² Beta-Gamma and <20 dpm/100 cm² Alpha.

5.3.15 **INSTALL** bird screen over new Radial breather filter.

5.3.16 **WHILE** ensuring bird screen alignment up into the weather cover, **INSTALL** weather cover and wing nut.

NOTE - Valve handle normally aligns with inlet pipe when open.

5.3.17 **REQUEST** Operations personnel to **FULLY OPEN** filter isolation valve, and if valve is fitted with latching device, to ensure mechanical latch is used.

Limits - LCO 3.2.3, SST 241-B-203 and 241-B-204 Passive Ventilation Systems.

5.3.18 **INFORM** Shift Manager of valve status.

5.3.19 **STOP** work place air sampler.

5.3.20 **PERFORM** post-job contamination and radiation surveys of the work area, **AND**

RECORD on Data Sheet 2.

Data Sheet 2 – Daily Survey Data

Daily Survey Data Sheet*				
Condition	Number	Date	Time	Initials
Pre-Job contamination and radiation survey number				
DRI survey form numbers				
DRI survey form numbers				
DRI survey form numbers				
Post-Job contamination and radiation survey number				
Comments:				

* Additional copies of this data sheet shall be made as needed by this procedure.

Data Sheet 3 - Filter Installation Data

Radial HEPA Filter Change-out Data Sheet*			
Work Package Number			
Date of Installation			
Flammable Gas Concentration		IHT Initials and date	
Record Filter BIN/Component Number (e.g. 600000-1/TP-FLT-001)			
Used Filter Waste Container Bin Number			
Inspect for:		SAT	UNSAT**
No Damage to New HEPA Filter			
No Damage to Filter Weather Covers			
No Damage to Filter Threads			
No Damage to Bird Screen			
Bird Screen properly installed (including alignment with weather cover)			
No Missing Fasteners			
No Missing Labels on Filter Assembly or Weather Covers			
Filter Isolation Valve Operates Properly			
No Water in Filter			
No Visible Punctures, Corrosion, or Other Foreign Objects in Filter Assembly			
New Filter Installed Properly with No Discrepancies			
Comment:			

* Additional copies of this data sheet shall be made for each individual filter installed by this procedure.

** Any UNSAT conditions found should be described on Comment Page, a PER should be generated by the FWS for all UNSAT conditions, a work request should be generated by the FWS for all UNSAT conditions to correct the problem, and the System Engineer should be notified.

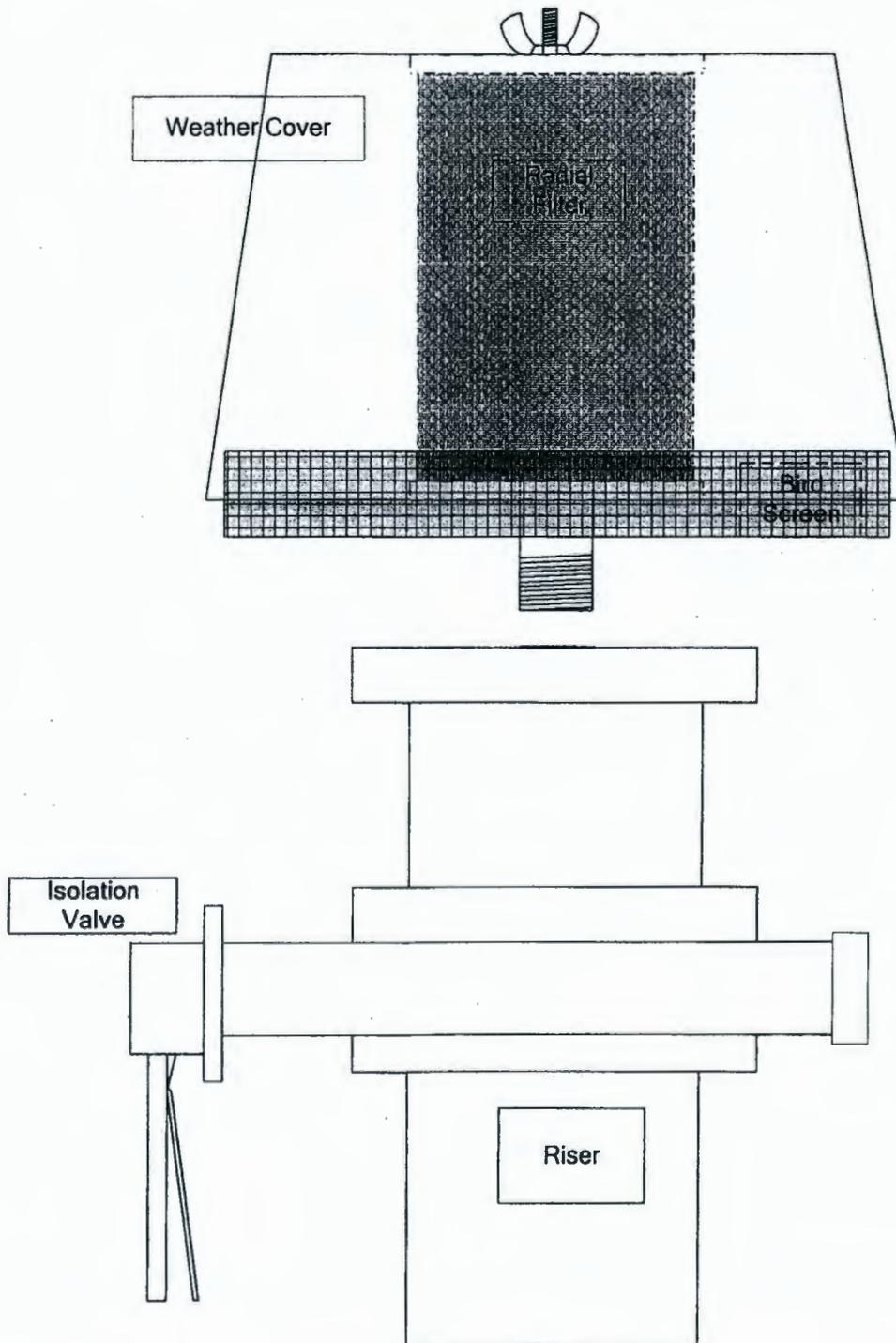
Craftsman: _____ / _____ / _____
 Signature Print Name Date

Craftsman: _____ / _____ / _____
 Signature Print Name Date

Data Sheet 4 – FWS/Engineering/Environmental Review

PER Numbers Generated (if Applicable)			
Work Request Numbers Generated (if Applicable)			
FWS:			
Signature		Print Name	Date
Forward package to System Engineer for review and signature.			
System Engineer:			
Signature		Print Name	Date
Forward package to Environmental for review and signature.			
Environmental:			
Signature		Print Name	Date

Figure 1 – Flanders Filter Bag-In/Bag-Out Components



CH2M BILL OF MATERIAL

ORIGINAL

B.O.M. Suppl. 4

Use: S-102 Spill Recovery		Wk. Pkg. No.: CLO-WO-07-1840		CACN/COA: 503003/FA30	
Order Date: 01/30/2008	Requestor: Matthews, Richard	Delivery Location: 2101HV/Storage location R6-24	Premium Freight <input type="checkbox"/>	Priority: 3.1	CGI: N/A
Date Required: 02/12/2008 Mandatory <input checked="" type="checkbox"/> Desired	Special Instructions/Emergency Justification: Available in spare parts. 	Requestor: Matthews, Richard (373-9604) Date: 01/30/2008 Requestor: Hull, Kevin J (376-0145) Date: 02/01/2008 Engineer: Not Required per DRA RadCon: Not Required per DRA Industrial Health: Not Required per DRA Safety & Health: Not Required per DRA Cost Account Manager: Shults, Duane L (373-4244) Date: 02/12/2008 Material Coordinator: Not Required per DRA	Not Required per DRA Manager: Bores, John F (376-8131) Date: 02/01/2008 QA Engineer: Not Required per DRA Environmental: Not Required per DRA Chemical Management: Not Required per DRA Resp. Protection: Duncan, Vella (373-3852) Date: 02/01/2008 Material Coordinator Manager: Not Required per DRA		
Suggested Vendor:					
Clauses:					

Line #	Quantity	Estimated Cost	Safety Class	HAZMAT	MSDS	NRTL	Approval Desig.	Quality Level	QC Approval	Date/Qty Ordered	Order No.	Catalog No.	
1	1	1480.00	GS				Q	3	KW 2/17/08	02/12/2008, 1.00	10001475	0000626931	
	Unit: EACH	Delivery Date:	Storage Level: C - INDOORS (WEATHER TIGHT)			Date/Qty Staged: 02/14/2008, 1.00	Storage Bldg/Area: 2101HV/200E	Storage Location: R6-24					
Material Description: VALVE, 4 IN.				Additional Description:									
Purchasing Description:				Comments: In Stock, in SPARES, in 2101M would like moved to 2101HV/200E Storage Location R6-24. Please put with ENRAF in that location. Both will go to the CLO-WO-07-1840 S-102 location. NOTE: Item is already green-tagged GS/QL-3. No QAIP required.									
Item Number: 18466U 150	Equipment Type: VALVES	Manufacturer: WORCESTER CONTROL	Drawing/ECN/Spec Number: H-2-817634, sheet 1, Item 20										

RELEASED COMPLETE

Line # Released: _____ Released To: _____
 Signature: _____

CH2M BILL OF MATERIAL

ORIGINAL

B.O.M. Suppl. 6

Use: S-102 Radial Filter		Wk. Pkg. No.: CLO-WO-07-1840		CACN/COA: 503003/FA30	
Date: 03/26/2008	Requestor: Hjellum, Al	Delivery Location: 2101 HV	Premium Freight <input type="checkbox"/>	Priority: 2.1	CGI:
Required: 04/03/2008 Mandatory <input checked="" type="checkbox"/> Desired	Special Instructions/Emergency Justification: Items having approval designator Q* shall be inspected at issue to field for suspect / counterfeit items.	Hjellum, Al (372-2540) 03/27/2008 Requestor Date	Not Required per DRA		
Suggested Vendor: ous		Farris, Troy R (430-3136) 03/28/2008 Engineer Date	Manager Date Bores, John F (376-8131) 03/28/2008		
Clauses: is 1, 2, 3, and 6: N/A Items 4, 5, and 7: Material-on-hand (B ses already satisfied)		Not Required per DRA RadCon Date	Not Required per DRA Environmental Date		
		Not Required per DRA Industrial Health Date	Not Required per DRA Chemical Management Date		
		Not Required per DRA Safety & Health Date	Not Required per DRA Resp. Protection Date		
		Tucker, Ron (372-0910) 03/28/2008 Cost Account Manager Date	Duncan, Vella (373-3852) 03/28/2008 Material Coordinator Manager Date		
		Shults, Duane L (373-4244) 03/31/2008 Material Coordinator Date			

1	Quantity: 10	Estimated Cost: 8.00	Safety Class: GS	HAZMAT	MSDS	NRTL	Approval Desig: Q*	Quality Level: 0	QC Approval: <i>4-21-08</i>	Date/Qty Ordered: 03/31/2008, 10.00	Order No: H00689101537	Catalog No: PC00032751	
	Unit: EACH	Delivery Date	Storage Level: B - INDOORS (TEMPERATURE CONTROLLED/WEATHER TIGHT)			Date/Qty Staged: 04/14/2008, 10.00	Storage Bldg/Area: 2101HV/200E	Storage Location: R6-39					

Material Description: .T, HEAVY HEX, 5/8-11UNC-2A X 2 IN. LONG, ASTM A193 GR. B8	Additional Description:		
Material Description:	Comments:		
Number	Equipment Type: FASTENERS	Manufacturer: NOT APPLICABLE	Drawing/ECN/Spec Number: H-2-90718, Sht 25, PN196

2	Quantity: 2	Estimated Cost: 5.00	Safety Class: GS	HAZMAT	MSDS	NRTL	Approval Desig: N/A	Quality Level: 0	QC Approval:	Date/Qty Ordered: 04/01/2008, 2.00	Order No: MOH 2101HV SHOP	Catalog No: OTH0006587	
	Unit: EACH	Delivery Date	Storage Level: B - INDOORS (TEMPERATURE CONTROLLED/WEATHER TIGHT)			Date/Qty Staged: 04/01/2008, 2.00	Storage Bldg/Area: 2101HV/200E	Storage Location: SHOP					

Material Description: ket, 4" x 1/8" Thk for 4" 150# Flange, Compressed Fiber Non Asbestos	Additional Description: Garlock "Blue-Gard" Style 3000		
Material Description:	Comments:		
Number	Equipment Type: GASKET/SEALS/O-RING/PACK	Manufacturer: Garlock	Drawing/ECN/Spec Number: H-2-90718, Sht 25, PN172

3	Quantity: 2	Estimated Cost: 5.00	Safety Class: GS	HAZMAT	MSDS	NRTL	Approval Desig: Q*	Quality Level: 0	QC Approval: <i>4-21-08</i>	Date/Qty Ordered: 04/21/2008, 2.00	Order No: MOH	Catalog No: OTH0006618	
	Unit	Delivery Date	Storage Level			Date/Qty Staged	Storage Bldg/Area	Storage Location					

EACH		B - INDOORS (TEMPERATURE CONTROLLED/WEATHER TIGHT)				04/21/2008, 2.00		2101HV/200E		R7-E2		
<u>Material Description:</u> nut, Winged 3/8"-16UNC Washer						<u>Additional Description:</u>						
<u>Purchasing Description:</u>						<u>Comments:</u>						
<u>Part Number</u> A			<u>Equipment Type</u> FASTENERS			<u>Manufacturer</u> Various			<u>Drawing/ECN/Spec Number</u> H-2-90718, Sht 25, PN190			
<u>Item</u> 4	<u>Quantity</u> 1	<u>Estimated Cost</u> 250.00	<u>Safety Class</u> GS	<u>HAZMAT</u>	<u>MSDS</u>	<u>NRTL</u>	<u>Approval Desig.</u> Q	<u>Quality Level</u> 3	<u>QC Approval</u> JE 4-21-08	<u>Date/Qty Ordered</u> 04/21/2008, 1.00	<u>Order No.</u> MOH	<u>Catalog No.</u> 0000627323
<u>Unit</u> EACH		<u>Delivery Date</u>	<u>Storage Level</u> B - INDOORS (TEMPERATURE CONTROLLED/WEATHER TIGHT)				<u>Date/Qty Staged</u> 04/21/2008, 1.00		<u>Storage Bldg/Area</u> 2101HV/200E	<u>Storage Location</u> R7-E2		
<u>Material Description:</u> 30 cfm Weather Cover						<u>Additional Description:</u>						
<u>Purchasing Description:</u>						<u>Comments:</u> Material on hand and already green-tagged GS/QL-3. No QAIP required.						
<u>Part Number</u> A			<u>Equipment Type</u> HVAC			<u>Manufacturer</u> Various			<u>Drawing/ECN/Spec Number</u> H-2-90718, Sht 25, PN205			
<u>Item</u> 5	<u>Quantity</u> 1	<u>Estimated Cost</u> 50.00	<u>Safety Class</u> GS	<u>HAZMAT</u>	<u>MSDS</u>	<u>NRTL</u>	<u>Approval Desig.</u> Q	<u>Quality Level</u> 3	<u>QC Approval</u> JE 4-21-08	<u>Date/Qty Ordered</u> 04/21/2008, 1.00	<u>Order No.</u> MOH	<u>Catalog No.</u> OTH0006619
<u>Unit</u> EACH		<u>Delivery Date</u>	<u>Storage Level</u> B - INDOORS (TEMPERATURE CONTROLLED/WEATHER TIGHT)				<u>Date/Qty Staged</u> 04/21/2008, 1.00		<u>Storage Bldg/Area</u> 2101HV/200E	<u>Storage Location</u> R7-E2		
<u>Material Description:</u> 30 cfm Breather Filter Bird Screen						<u>Additional Description:</u> Fabricate Bird Screen - 1/2" Stainless Expanded Metal						
<u>Purchasing Description:</u> see H-2-90718, Sht 16, PN228 and 229.						<u>Comments:</u> Item 5 may be obtained from existing stock in 2101HV, or fabricated item from CLO-WO-07-1618 (supp 4). No QAIP required.						
<u>Part Number</u> A			<u>Equipment Type</u> HVAC			<u>Manufacturer</u> Various			<u>Drawing/ECN/Spec Number</u> H-2-90718, Sht 25, PN 229			
<u>Item</u> 6	<u>Quantity</u> 10	<u>Estimated Cost</u> 8.00	<u>Safety Class</u> GS	<u>HAZMAT</u>	<u>MSDS</u>	<u>NRTL</u>	<u>Approval Desig.</u> Q*	<u>Quality Level</u> 0	<u>QC Approval</u> JE 4-21-08	<u>Date/Qty Ordered</u> 03/31/2008, 10.00	<u>Order No.</u> H00689101537	<u>Catalog No.</u> PC00032752
<u>Unit</u> EACH		<u>Delivery Date</u>	<u>Storage Level</u> C - INDOORS (WEATHER TIGHT)				<u>Date/Qty Staged</u> 04/14/2008, 10.00		<u>Storage Bldg/Area</u> 2101HV/200E	<u>Storage Location</u> R6-39		
<u>Material Description:</u> OLT, HEAVY HEX, 5/8-11UNC-2A X 1-3/4 IN. LONG, ASTM A193 GR. B8						<u>Additional Description:</u>						
<u>Purchasing Description:</u>						<u>Comments:</u>						
<u>Part Number</u> N/A			<u>Equipment Type</u> FASTENERS			<u>Manufacturer</u> NOT APPLICABLE			<u>Drawing/ECN/Spec Number</u> H-2-90718, Sht 25, PN201			
<u>Item</u> 7	<u>Quantity</u> 1	<u>Estimated Cost</u> 4000.00	<u>Safety Class</u> GS	<u>HAZMAT</u>	<u>MSDS</u>	<u>NRTL</u>	<u>Approval Desig.</u> Q	<u>Quality Level</u> 3	<u>QC Approval</u> JE 4-21-08	<u>Date/Qty Ordered</u> 04/21/2008, 1.00	<u>Order No.</u> MOH	<u>Catalog No.</u> OTH0006620
<u>Unit</u> EACH		<u>Delivery Date</u>	<u>Storage Level</u> B - INDOORS (TEMPERATURE CONTROLLED/WEATHER TIGHT)				<u>Date/Qty Staged</u> 04/21/2008, 1.00		<u>Storage Bldg/Area</u> 2101HV/200E	<u>Storage Location</u> R7-E2		
<u>Material Description:</u> 4" dia filter mounting flange assembly (Flange Subassembly)						<u>Additional Description:</u> 40 cfm Filter Mounting Flange Sub Assy.						
<u>Purchasing Description:</u>						<u>Comments:</u> Material on hand and already green-tagged GS/QL-3. No QAIP required.						

Part Number A	Equipment Type HVAC	Manufacturer Various	Drawing/ECN/Spec Number H-2-90718, Sht 25, PN223
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PARTIAL RELEASE

Line # Released: _____

 Date Released: _____ Released To: _____
 Signature: _____

RELEASED COMPLETE

Line # Released: Air Released To: STEVE WADE
 Signature: Steve Wade 4-22-08

CH2M BILL OF MATERIAL

ORIGINAL

B.O.M. Suppl. 7

Ord Use: S-102, Event Recovery			Wk. Pkg. No.: CLO-WO-07-1840			CACN/COA: 503003/FA30					
Date: 04/14/2008		Requestor: Matthews, Richard		Delivery Location: 2101HV		Premium Freight <input type="checkbox"/>		Priority: 3.1	CGI: N/A		
Date Required: 04/18/2008		Special Instructions/Emergency Justification: Item 3 - Material On Hand at 2101M. Ron Tucker gave permission to have this order use air freight. see e-mail with order, 4-17-2008, dls.		Matthews, Richard (373-9604) 04/17/2008		Not Required per DRA					
<input type="checkbox"/> Mandatory <input checked="" type="checkbox"/> Desired				Requestor Date Hull, Kevin J (376-0145) 04/16/2008		Manager Date Bores, John F (376-8131) 04/17/2008					
Suggested Vendor:				Engineer Date Not Required per DRA		QA Engineer Date Not Required per DRA					
				RadCon Date Not Required per DRA		Environmental Date Not Required per DRA					
A Clauses:				Industrial Health Date Not Required per DRA		Chemical Management Date Not Required per DRA					
A				Safety & Health Date Not Required per DRA		Resp. Protection Date Duncan, Vella (373-3852) 04/17/2008					
				Cost Account Manager Date Shults, Duane L (373-4244) 04/17/2008		Material Coordinator Manager Date					
				Material Coordinator Date							

Item	Quantity	Estimated Cost	Safety Class	HAZMAT	MSDS	NRTL	Approval Desig.	Quality Level	QC Approval	Date/Qty Ordered	Order No.	Catalog No.
1	3	41.00	GS				N/A	0		04/17/2008, 3.00	H00689101559	PC00033209
	Unit	Delivery Date	Storage Level			Date/Qty Staged			Storage Bldg/Area	Storage Location		
	EACH		C - INDOORS (WEATHER TIGHT)			04/21/2008, 3.00			2101HV/200E	R7-H3		

Material Description: 1/2" SS, Cam-and-Groove Hose Coupling. Cap X Socket (Dust Cap), Female fitting						Additional Description: Page 284, McMaster/Carr Catalog					
Purchasing Description:						Comments:					
Part Number: 015K84			Equipment Type: MECHANICAL			Manufacturer: unknown			Drawing/ECN/Spec Number: Drawing TMR-06-HFOR-VP2-060		

Item	Quantity	Estimated Cost	Safety Class	HAZMAT	MSDS	NRTL	Approval Desig.	Quality Level	QC Approval	Date/Qty Ordered	Order No.	Catalog No.
2	3	27.53	GS				N/A	0		04/17/2008, 3.00	H00689101559	PC00033210
	Unit	Delivery Date	Storage Level			Date/Qty Staged			Storage Bldg/Area	Storage Location		
	EACH		C - INDOORS (WEATHER TIGHT)			04/21/2008, 3.00			2101HV/200E	R7-H3		

Material Description: 1/2" SS, Cam-and-Groove Hose Coupling. Plug X Cap (Dust Plug), Male fitting						Additional Description: Page 285, McMaster/Carr Catalog					
Purchasing Description:						Comments:					
Part Number: 015K74			Equipment Type: MECHANICAL			Manufacturer: unknown			Drawing/ECN/Spec Number: Drawing TMR-06-HFOR-VP2-060		

Item	Quantity	Estimated Cost	Safety Class	HAZMAT	MSDS	NRTL	Approval Desig.	Quality Level	QC Approval	Date/Qty Ordered	Order No.	Catalog No.
3	1	1268.60	GS				Q	3	KW 4/22/08	04/17/2008, 1.00	10001611	0000628014
	Unit	Delivery Date	Storage Level			Date/Qty Staged			Storage Bldg/Area	Storage Location		
	EACH		C - INDOORS (WEATHER TIGHT)			04/22/2008, 1.00			2101HV/200E	R7-H3		

Serial Description: MPER, 4 IN. DIA, BUTTERFLY VALVE, F/WYE ASSY		Additional Description:	
Chasing Description:		Comments: This item is on-hand and green-tagged GS/QL-3. No QAIP required.	
Number OK 362-173 K-LOK 362-173	Equipment Type VALVES	Manufacturer KEYSTONE	Drawing/ECN/Spec Number H-2-90718, Sheet 15, rev 7, Item 171

PARTIAL RELEASE

Line # Released: _____

Date Released: _____ Released To: _____

Signature: _____

RELEASED COMPLETE

Line # Released: ALL Released To: STEVE WADE

Signature: Steve Wade

4-22-08

CH2M BILL OF MATERIAL

ORIGINAL

B.O.M. Suppl. 8

Use: S-102, Spill Cleanup		Wk. Pkg. No.: CLO-WO-07-1840		CACN/COA: 503003/FA30	
Date: 04/16/2008	Requestor: Matthews, Richard	Delivery Location: 2101M	Premium Freight <input type="checkbox"/>	Priority: 3.1	CGI:
Date Required: 04/21/2008 Mandatory <input type="checkbox"/> Desired	Special Instructions/Emergency Justification: Inspect Item 1 for S/CI. 	Requestor: Matthews, Richard (373-8604) 04/16/2008 Date Requestor: Hull, Kevin J (376-0145) 04/16/2008 Date Engineer: Not Required per DRA Date RadCon: Not Required per DRA Date Industrial Health: Not Required per DRA Date Safety & Health: Not Required per DRA Date Cost Account Manager: Shults, Duane L (373-4244) 04/17/2008 Date Material Coordinator: Not Required per DRA Date	Not Required per DRA Manager: Bores, John F (376-8131) 04/17/2008 Date QA Engineer: Not Required per DRA Date Environmental: Not Required per DRA Date Chemical Management: Not Required per DRA Date Resp. Protection: Duncan, Vella (373-3852) 04/17/2008 Date Material Coordinator Manager: Not Required per DRA Date		
Suggested Vendor:					
Clauses: A					

Item 1	Quantity: 8	Estimated Cost: 0.00	Safety Class: SC	HAZMAT	MSDS	NRTL	Approval Desig: Q*	Quality Level: 3	QC Approval: <i>KW 4/22/08</i>	Date/Qty Ordered: 04/17/2008, 8.00	Order No: 10001613	Catalog No: 0000617609
	Unit: EACH	Delivery Date	Storage Level: C - INDOORS (WEATHER TIGHT)			Date/Qty Staged: 04/22/2008, 8.00	Storage Bldg/Area: 2101HV/200E	Storage Location: R7-H3				
Material Description: 1/2" HT, HEX, HVY, 5/8 IN.-11UNC-2A X 2 IN. LG, ASTM A193, GR B8.						Additional Description:						
Purchasing Description:						Comments:						
Item Number	Equipment Type: FASTENERS	Manufacturer: NOT APPLICABLE			Drawing/ECN/Spec Number: H-2-90718, Sht. 25, item # 196							

PARTIAL RELEASE

Line # Released: _____
 Date Released: _____ Released To: _____
 Signature: _____

RELEASED COMPLETE

Line # Released: *AW* Released To: *STEVE WADE*
 Signature: *Steve Wade*
4-22-08

CH2M BILL OF MATERIAL

ORIGINAL

B.O.M. Suppl. 0

End Use: S-102 - Equipment removal	Wk. Pkg. No.: CLO-WO-07-1840	CACN/COA: 503003/AF20
Issue Date: 11/14/2007	Requestor: Wilson, Galen	Delivery Location: 2101HV
	Premium Freight <input checked="" type="checkbox"/>	Priority: 2.0
		CGI: N/A

Date Required: 11/19/2007 <input type="checkbox"/> Mandatory <input checked="" type="checkbox"/> Desired Suggested Vendor: A Clauses: A	Special Instructions/Emergency Justification: Premium freight requested to ensure S-102 spill cleanup activities are not delayed. Q* - Check for suspect and counterfeit items. 	<table border="1"> <tr> <td>Wilson, Galen (376-1598)</td> <td>11/14/2007</td> <td>Baide, Dan (376-3274)</td> <td>11/16/2007</td> </tr> <tr> <td>Requestor</td> <td>Date</td> <td>Manager</td> <td>Date</td> </tr> <tr> <td>Fish, Michael a (Chg) (372-3657)</td> <td>11/19/2007</td> <td>Cannon, Joel M (372-3241)</td> <td>11/19/2007</td> </tr> <tr> <td>Engineer</td> <td>Date</td> <td>QA Engineer</td> <td>Date</td> </tr> <tr> <td>Not Required per DRA</td> <td></td> <td>Not Required per DRA</td> <td></td> </tr> <tr> <td>RadCon</td> <td>Date</td> <td>Environmental</td> <td>Date</td> </tr> <tr> <td>Not Required per DRA</td> <td></td> <td>Not Required per DRA</td> <td></td> </tr> <tr> <td>Industrial Health</td> <td>Date</td> <td>Chemical Management</td> <td>Date</td> </tr> <tr> <td>Not Required per DRA</td> <td></td> <td>Not Required per DRA</td> <td></td> </tr> <tr> <td>Safety & Health</td> <td>Date</td> <td>Resp. Protection</td> <td>Date</td> </tr> <tr> <td>Bauer, Roger E (376-5908)</td> <td>11/19/2007</td> <td>Bushnell, Pery K (373-5524)</td> <td>11/19/2007</td> </tr> <tr> <td>Cost Account Manager</td> <td>Date</td> <td>Material Coordinator Manager</td> <td>Date</td> </tr> <tr> <td>Shults, Duane L (373-4244)</td> <td>11/19/2007</td> <td></td> <td></td> </tr> <tr> <td>Material Coordinator</td> <td>Date</td> <td></td> <td></td> </tr> </table>	Wilson, Galen (376-1598)	11/14/2007	Baide, Dan (376-3274)	11/16/2007	Requestor	Date	Manager	Date	Fish, Michael a (Chg) (372-3657)	11/19/2007	Cannon, Joel M (372-3241)	11/19/2007	Engineer	Date	QA Engineer	Date	Not Required per DRA		Not Required per DRA		RadCon	Date	Environmental	Date	Not Required per DRA		Not Required per DRA		Industrial Health	Date	Chemical Management	Date	Not Required per DRA		Not Required per DRA		Safety & Health	Date	Resp. Protection	Date	Bauer, Roger E (376-5908)	11/19/2007	Bushnell, Pery K (373-5524)	11/19/2007	Cost Account Manager	Date	Material Coordinator Manager	Date	Shults, Duane L (373-4244)	11/19/2007			Material Coordinator	Date		
Wilson, Galen (376-1598)	11/14/2007	Baide, Dan (376-3274)	11/16/2007																																																							
Requestor	Date	Manager	Date																																																							
Fish, Michael a (Chg) (372-3657)	11/19/2007	Cannon, Joel M (372-3241)	11/19/2007																																																							
Engineer	Date	QA Engineer	Date																																																							
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RadCon	Date	Environmental	Date																																																							
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Bauer, Roger E (376-5908)	11/19/2007	Bushnell, Pery K (373-5524)	11/19/2007																																																							
Cost Account Manager	Date	Material Coordinator Manager	Date																																																							
Shults, Duane L (373-4244)	11/19/2007																																																									
Material Coordinator	Date																																																									

Item	Quantity	Estimated Cost	Safety Class	HAZMAT	MSDS	NRTL	Approval Desig.	Quality Level	QC Approval	Date/Qty Ordered	Order No.	Catalog No.
1	1	40.00	GS				Q*	0	JE 11-29-07	11/19/2007, 1.00	h00689101346	PC00030359
	Unit	Delivery Date	Storage Level			Date/Qty Staged		Storage Bldg/Area	Storage Location			
	EACH		C - INDOORS (WEATHER TIGHT)			11/29/2007, 1.00		2101HV/200E	R6-36			

Material Description: Manifold, 2" threaded, Class 3000 w/ viton seal	Additional Description:
Purchasing Description:	Comments: Note: These parts are used to assembly the top manifold plug assembly to allow removal of the top manifold (flush manifold)
Part Number 31-8V-304	Equipment Type PLUMBING
Manufacturer Hart Industries	Drawing/ECN/Spec Number N/A

Item	Quantity	Estimated Cost	Safety Class	HAZMAT	MSDS	NRTL	Approval Desig.	Quality Level	QC Approval	Date/Qty Ordered	Order No.	Catalog No.
2	1	20.00	GS				Q*	0	JE 11-29-07	11/19/2007, 1.00	h00689101346	PC00030360
	Unit	Delivery Date	Storage Level			Date/Qty Staged		Storage Bldg/Area	Storage Location			
	EACH		C - INDOORS (WEATHER TIGHT)			11/29/2007, 1.00		2101HV/200E	R6-36			

Material Description: PPLE, 2" NPT Both Ends, Sched. 40, 12" long, ASTM A312, 304L SST	Additional Description:
Purchasing Description:	Comments:
Part Number A	Equipment Type PLUMBING
Manufacturer Unknown	Drawing/ECN/Spec Number N/A

Item	Quantity	Estimated Cost	Safety Class	HAZMAT	MSDS	NRTL	Approval Desig.	Quality Level	QC Approval	Date/Qty Ordered	Order No.	Catalog No.
3	1	5.00	GS				Q*	0	JE 11-29-07	11/19/2007, 1.00	h00689101346	PC00030361
	Unit	Delivery Date	Storage Level			Date/Qty Staged		Storage Bldg/Area	Storage Location			

EACH		C - INDOORS (WEATHER TIGHT)				11/29/2007, 1.00	2101HV/200E	R6-36				
Material Description: Pipe, 2" NPT, Class 1000, ASTM A182 304/304L SST					Additional Description:							
Purchasing Description:					Comments:							
Part Number A		Equipment Type PLUMBING		Manufacturer Unknown		Drawing/ECN/Spec Number N/A						
Item	Quantity	Estimated Cost	Safety Class	HAZMAT	MSDS	NRTL	Approval Desig.	Quality Level	QC Approval	Date/Qty Ordered	Order No.	Catalog No.
4	2	50.00	GS				Q*	0	DE 11-29-07	11/19/2007, 2.00	h00689101346	PC00030362
	Unit	Delivery Date	Storage Level				Date/Qty Staged	Storage Bldg/Area	Storage Location			
	EACH		C - INDOORS (WEATHER TIGHT)				11/29/2007, 2.00	2101HV/200E	R6-36			
Material Description: Flange, Blind, 4", ASTM A182 304/304L SST					Additional Description:							
Purchasing Description:					Comments:							
Part Number A		Equipment Type PLUMBING		Manufacturer Unknown		Drawing/ECN/Spec Number N/A						

PARTIAL RELEASE

Line # Released: _____

 Date Released: _____ Released To: _____
 Signature: _____

RELEASED COMPLETE

Line # Released: _____ Released To: _____
 Signature: _____

CH2M BILL OF MATERIAL

ORIGINAL

B.O.M. Suppl. 1

id Use: S-102 Removal of contaminated matls		Wk. Pkg. No.: CLO-WO-07-1840		CACN/COA: 503003/FA30	
ite: 01/24/2008		Requestor: Matthews, Richard		Delivery Location: 2701HV	
Premium Freight <input type="checkbox"/>		Priority: 3.1		CGI: N/A	
Date Required: 01/31/2008 Mandatory <input checked="" type="checkbox"/> Desired		Special Instructions/Emergency Justification: Previously designated in spares for use at S-106.		Matthews, Richard (373-9604) 01/24/2008 Not Required per DRA	
Suggested Vendor: stock		Requestor Date Hull, Kevin J (376-0145) 01/29/2008		Manager Date Bores, John F (376-8131) 01/30/2008	
Clauses: A		Engineer Date Not Required per DRA		QA Engineer Date Not Required per DRA	
		RadCon Date Not Required per DRA		Environmental Date Not Required per DRA	
		Industrial Health Date Not Required per DRA		Chemical Management Date Not Required per DRA	
		Safety & Health Date Not Required per DRA		Resp. Protection Date Duncan, Vella (373-3852) 01/30/2008	
		Cost Account Manager Date Shults, Duane L (373-4244) 02/12/2008		Material Coordinator Manager Date	
		Material Coordinator Date			

MATERIAL SUPPORT
 TO SCHEDULE
 DATE 2-12-08
 DJJ

Item	Quantity	Estimated Cost	Safety Class	HAZMAT	MSDS	NRTL	Approval Desig.	Quality Level	QC Approval	Date/Qty Ordered	Order No.	Catalog No.
1	1	11000.00	GS				Q	3	2-12-08	02/12/2008, 1.00	PO18741	0000602357
	Unit	Delivery Date	Storage Level							Date/Qty Staged	Storage Bldg/Area	Storage Location
	EACH		C - INDOORS (WEATHER TIGHT)							02/12/2008, 1.00	2101HV/200E	R6-24
Material Description: TUBE, LEVEL, ENRAF 854 ATG, W/ 27 M OF PLAT/IRIDIUM WIRE						Additional Description:						
Purchasing Description:						Comments: Contact Mike Hay. ENRAF originally scheduled to be used at S-106 on BOM CLO-WO-07-0899 and staged at 2101HV/200E warehouse. This ENRAF will now be used at S-102 via this BOM. Original order # PO18741. Material on-hand and green-tagged GS/QL-3... no QAIP required. Note: Another BOM will identify the other items, such as the displacer, spool piece, etc., necessary for equipping S-102 with a functional ENRAF. This BOM is only to secure the ENRAF head unit for S-102 that was previously earmarked to go to S-106.						
Part Number EAZ854M21FDLC*W 854 ATG			Equipment Type INSTRUMENTATION/CONTROL			Manufacturer ENRAF			Drawing/ECN/Spec Number H-2-817634, P/N 3, sheet 1			

S/N 854-35-355

RELEASED COMPLETE

Line # Released: _____ Released To: _____
 Signature: _____

UNREVIEWED SAFETY QUESTION (USQ) SCREENING

USQ No.:

TF-08-0731-S

Rev.

0

Title: Change to Work Package CLO-WO-07-01840, S-102 Remove Remaining Equipment

Change Description: The subject work package was evaluated by USQ Determination TF-08-0695. Part of the package requires that a video camera be placed in the tank. Now that work is underway in the field, it has become necessary to repeat the steps involved with placing and removing the camera. This will allow correction of a focusing problem with the camera. Adding a statement to the work instructions to allow the camera to be removed and replaced falls into the scope of Categorical Exclusion 3 (GCX-3), *Categorical Exclusion for Work Instructions, Work Permits, or other Documents used for Execution of Work Packages.*

Categorical Exclusion (If applicable, check box and sign below)

- GCX-1 (USQ Evaluator)
 GCX-2 (USQ Evaluator or designated staff)
 GCX-3 (USQ Evaluator or designated staff)

Document Type(s) and Identification Number(s): Work Package CLO-WO-07-01840**Project Identification No:** N/A**Area:** East West General**Facility:** SST DST Other (specify):**Based on this evaluation, this change does not require a USQ determination, i.e., this has been screened out of the USQ process.** Safety basis change is required.

Initiate change in accordance with TFC-ENG-SB-C-01. Enter SBCN No.:

SIGNATURES**Trainee Preparer** N/A

Print name:

Sign:

Date:

Preparer

Print name:

Sign: *(My signature below indicates that my USQ qualification is current on this date.)*

Org./MSIN:

Phone:

Date:

Reviewer

Print name:

Sign: *(My signature below indicates that my USQ qualification is current on this date.)*

Org./MSIN:

Phone:

Date:

Categorical Exclusion Preparer

Print name: L.S. Krogsrud

Sign: *(My signature below indicates that my USQ qualification is current on this date, or I am designated to sign for Categorical Exclusion [GCX-2 and GCX-3 only].)*
L.S. Krogsrud

Org./MSIN: S7-24

Phone: 372-2302

Date: April 28, 2008

EACH		C - INDOORS (WEATHER TIGHT)				02/28/2008, 12.00		2101HV/200E		R7-H1		
Material Description: NUTS, HEX OR HVY HEX, 7/8"-9- UNC 2-B, ASTM A194, GR 7 OR 2H						Additional Description:						
Purchasing Description:						Comments:						
Part Number Unknown			Equipment Type FASTENERS			Manufacturer Unknown			Drawing/ECN/Spec Number ECN-724065-R2, Page 11, Note 2			
Item	Quantity	Estimated Cost	Safety Class	HAZMAT	MSDS	NRTL	Approval Desig.	Quality Level	QC Approval	Date/Qty Ordered	Order No.	Catalog No.
4	12	25.00	GS				Q*	0	JC 2-28-08	02/15/2008, 12.00	H00689101489	PC00032021
	Unit	Delivery Date	Storage Level				Date/Qty Staged		Storage Bldg/Area		Storage Location	
	EACH		C - INDOORS (WEATHER TIGHT)				02/28/2008, 12.00		2101HV/200E		R7-H1	
Material Description: BOLTS, HEX OR HVY HEX, 7/8"-9- UNC 2-A, 4 1/2" L, ASTM A193, GR B7 OR 2H						Additional Description:						
Purchasing Description:						Comments:						
Part Number Unknown			Equipment Type FASTENERS			Manufacturer Unknown			Drawing/ECN/Spec Number ECN-724065-R2, Page 11, Note 2			

PARTIAL RELEASE

Line # Released: _____

Date Released: _____ Released To: _____

Signature: _____

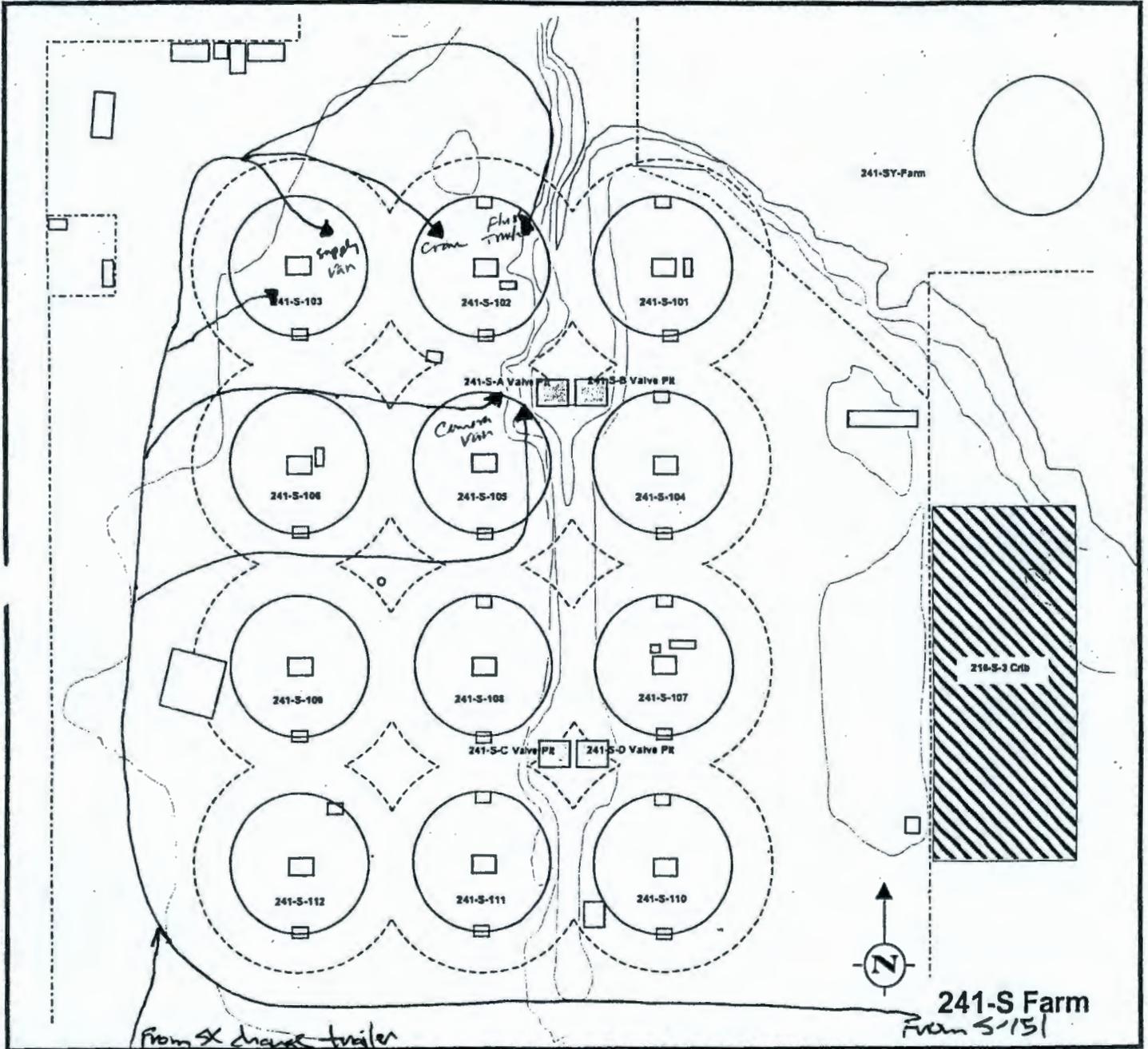
RELEASED COMPLETE

Line # Released: _____ Released To: _____

Signature: _____

VEHICLE AND DOME LOAD CONTROL IN TANK FARM FACILITIES

ATTACHMENT A - TANK FARM VEHICLE ROUTE MAP



If a vehicle travels through the exclusion zones or over the domes of other tanks to reach the work location, the dome load log for each affected tank shall be updated as required by Section 4.2, step 11.

Remarks: Follow route map to S-102, stage 40 ton crane (80,000 lbs) Supply Van (15,000 lbs) at S-103, Camera Van (15,000 lbs) at S-105, Flush truck (10,000 lbs) at S-102

Preparer M. Johnson

Date 4-21-08

Field Work Supervisor [Signature]

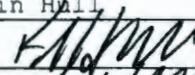
Date 4-21-08

Shift Manager [Signature]

Date 4-21-08

LOADS ADDED PER CUC-WO-07-1614 ON 4/21/08 NE 4/23/08

IGNITION SOURCE CONTROL REQUIREMENTS SCREENING

Work Document Number:	CLO-WO-07-1840		
Prepared By:	Kevin Hall		
Signature:		Date:	4/22/08
Responsible Engineer Approval Signature:		Date:	4/22/08

SECTION I. IGNITION SOURCE CONTROL REQUIREMENT APPLICABILITY

1	Does the activity or operation apply inside WASTE-INTRUDING EQUIPMENT as defined in HNF-SD-WM-TSR-006?
	Yes <input type="radio"/> No <input checked="" type="radio"/> If "Yes", Ignition Source Control Set 1 applies.
2	Does the activity or operation apply to the headspace of a Waste Group A DST or connected enclosed space directly above a Waste Group A DST?
	Yes <input type="radio"/> No <input checked="" type="radio"/> If "Yes", Ignition Source Control Set 2 applies.
3	Does the activity or operation apply to the headspace of a Waste Group B DST during mixer pump operation or air lift circulator operation?
	Yes <input type="radio"/> No <input checked="" type="radio"/> If "Yes", Ignition Source Control Set 2 applies.
4	Does the activity or operation apply to the headspace or connected enclosed space of an Inactive Tank that could have a spontaneous gas release event resulting in headspace flammable gas concentration \geq 100% of the LFL?
	Yes <input type="radio"/> No <input checked="" type="radio"/> If "Yes", Ignition Source Control Set 2 applies.
5	Does the activity or operation apply to the headspace or connected enclosed space of an Inactive Tank where flammable gas concentration controls are not applied and the headspace flammable gas concentration can reach \geq 100% of the LFL?
	Yes <input type="radio"/> No <input checked="" type="radio"/> If "Yes", Ignition Source Control Set 2 applies.
6	Does the activity or operation apply inside SST Vacuum Retrieval System equipment, including the slurry tank and water separator, which can be exposed to waste?
	Yes <input type="radio"/> No <input checked="" type="radio"/> If "Yes", Ignition Source Control Set 2 applies.

SECTION II. IGNITION SOURCE CONTROL REQUIREMENT COMPLIANCE

If the response to any item in Section I is "Yes", this section must be completed for affected operations and activities.
If the responses in Section I are "No", the screening is complete without filling in this section.

7	Document the ignition source control requirements that apply and the affected activities, materials, and equipment on an Ignition Source Control Evaluation Worksheet (A-6003-749).
8	Do the activities, materials, and equipment comply with the ignition source control requirements? FGEAB reviews of activities, materials, and equipment are documented in TFC-ENG-STD-13.
	Yes <input type="radio"/> No <input type="radio"/>
9	Do the activities, materials, and equipment provide equivalent safety per the FGEAB? FGEAB reviews of activities, materials, and equipment are documented in TFC-ENG-STD-13.
	Yes <input type="radio"/> No <input type="radio"/> Not Applicable <input type="radio"/>
10	If not all activities, materials, and equipment are addressed, is there an ORP-approved Safety Basis for this activity or operation that provides alternative ignition control requirements to address the flammable gas hazards?
	Yes <input type="radio"/> Specify:
	Does this approved basis clearly apply to the affected facilities?
	Yes <input type="radio"/> The activity or operation may proceed.
	No <input type="radio"/> The activity or operation is not permitted by the TSRs and ORP approval must be sought. Follow procedure in TFC-ENG-SB-C-01 to prepare and submit a Safety Basis amendment.
	No <input type="radio"/>

MATERIAL SAFETY DATA SHEET

SAFEGARD 5022A

MSDS # 020641

SECTION I

Manufacturer

Sanchem Inc
1600 S. Canal St.
Chicago, IL 60616
312-733-6100

TSCA Status

Components listed.
CAS Number: Mixture.

Transportation Emergency Telephone Formula

CHEMTREC: (800) 424-9300

Mixture.

SECTION II - HAZARDOUS INGREDIENTS/IDENTITY INFORMATION

None in reportable quantities per OSHA 1910.1200. See Section VI and X.

SECTION III - PHYSICAL/CHEMICAL CHARACTERISTICS (Typical data, not specifications)

Boiling Point
212°F (100°C)

Freeze Point
32°F (0°C)

Specific Gravity (H₂O=1)
1.0-1.2

Solubility in Water
Soluble in alkaline
water.

% Volatile by Weight
57-66% water

Vapor Density (Air = 1)
water: 0.63

Vapor Pressure
Water: 17

pH
5-8

Appearance and Odor
Hazy or while milky liquid.
Slight acrylate odor.

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% Volatile by Weight
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Vapor Density (Air = 1)
water: 0.63

Vapor Pressure
Water: 17

pH
5-8

Appearance and Odor
Hazy or while milky liquid.
Slight acrylate odor.

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

MSDS # 020641

Flash Point
Not applicable (NA),
water solution.

Ignition Temperature
NA

Flammable Limits in Air
(% by volume) Lower: NA
Upper: NA

Extinguishing Media

If water is evaporated, dry polymer could burn. Water spray, ABC dry chemical and protein type air foams are effective. Carbon dioxide may be ineffective on larger fires due to a lack of cooling capacity within may result in reignition.

Special Firefighting Procedure

Wear positive pressure self-contained breathing apparatus (SCBA). Personnel not having suitable respiratory protection must leave the area to prevent significant exposure to toxic combustion gases from any source. In enclosed or poorly ventilated areas, wear SCBA during cleanup immediately after a fire as well as during the attach phase of firefighting operations.

Unusual Fire and Explosion Hazards

None known.

SECTION V - REACTIVITY DATA

Stability
Stable

Hazardous Polymerization
Will not occur.

Hazardous Decomposition Products

CO, CO₂, aromatic and aliphatic hydrocarbons from burning dry polymer.

Incompatibility (conditions/materials to avoid)

- Avoid contact with strong oxidizing agents such as hydrogen peroxide, permanganates, and perchlorates. Depending on the amount of specific materials involved, contact can result in intense heat, boiling flame development, explosion or toxic gas generation.
- Lowering product pH by acid addition may cause precipitation.

SECTION VI - HEALTH HAZARD DATA

No toxicity tests have been conducted on this product. Information presented is our best judgment based upon similar products and/or individual components. As with all products for which limited data baser available, caution must be exercised through the use of protective equipment and handling procedures to minimize exposure.

Threshold Limit Value
None established for
product by OSHA or ACGIH.

Carcinogenic Status
Not listed by IARC,
NTP or OSHA.

Routes of Exposure
Eye/skin contact,
ingestion.

Acute Health Effects

None known. Eye contact may cause irritation. Repeated or prolonged skin contact may cause irritation. Vapors may cause eye and respiratory irritation. **NOTICE:** Product may contain residual amounts of a processing chemical (trade secret) in amounts <1%, but, infrequently, ≤1.5%. No adverse health effects are expected.

MSDS # 020641

Overexposure to the residual chemical by itself could cause symptoms such as eye and respiratory tract irritation, dizziness, anesthesia, headache, nausea, or vomiting.

<u>Chronic Health Effects</u>	<u>Signs/Symptoms of Exposure</u>	<u>Medical Conditions Aggravated by Exposure</u>
None known	Irritation	None known

Emergency and First Aid Procedure

If irritation occurs or persists from any route of exposure, remove the affected individual from the area. See a physician.

EYE CONTACT: Flush eyes with plenty of clean water for at least five (5) minutes while holding eyelids open.

SKIN CONTACT: Wash the affected area with plenty of soap and water.

INGESTION: Dilute by drinking water or milk. Induce vomiting by sticking finger down throat or by giving Syrup of Ipecac. See a physician.

INHALATION: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult give oxygen. Never give anything by mouth to an unconscious person. Call a physician.

SECTION VII - PRECAUTIONS FOR SAFE HANDLING AND USE

Steps to be taken in case material is released or spilled

Contain spill. If spilled in an enclosed area, ventilate. Do not flush liquid into public sewer or water systems. Recover as much as possible for reuse. Absorb remainder with an inter material. Place into closed container and store in a safe location to await disposal. Wash the spill area with soap and water. Change contaminated clothing and launder before reuse. Wear proper personal protective clothing and equipment.

CAUTION: Spilled liquid and dried film and slippery. Use care to avoid falls.

Waste Disposal Method

For waste disposal purposes, this product is not defined or designated as hazardous by current provisions of the Federal (EPA) Resources Conservation and Recovery Act (RCRA, 40CFR261). Liquid or dry material may be disposed of by incineration. Most states prohibit disposal of liquids in landfills. State and local regulations where the waste material is generated, treated and/or disposed must be examined to verify the appropriate waste classification.

Precautions to be taken in handling and storage

- Use under well ventilated conditions.
- Avoid skin and eye contact.
- Wash thoroughly after handling product. Always wash up before eating, smoking or using toilet facilities.
- Keep container closed when not in use and upright to prevent leakage.
- Store product where temperatures are between 50-100°F (10-38°C); ideally, 70°F (21°C).
- When neutralizing or adjusting pH, follow all safety precautions regarding proper use of the chemical involved.

- Storage tanks, pumps, piping and fittings should all be of stainless steel, glass lined carbon steel, glass fiber reinforced polyester, or epoxy or phenolic coated carbon steel. Avoid use of zinc. Copper, iron, aluminum or low carbon steel (these materials will cause either a breakdown of the polymer, discoloration of the resin or reduction of pH by reacting with ammonia present in some products).

SECTION VIII - CONTROL MEASURES

MSDS # 020641

Ventilation

Effective general and, if necessary, local exhaust ventilation must always be provided to draw fumes or vapors away from workers to prevent routine inhalation. Ventilation guidelines/techniques may be found in publications such as Industrial Ventilation, 20th Edition, American Conference of Governmental Industrial Hygienists, 6500 Glenway Avenue, Bldg. d-7, Cincinnati, OH 45211-4438.

Respiratory Protection

Not normally required. Wear an organic vapor respirator approved by NIOSH/MSHA whenever exposure to fumes or vapors cannot be avoided. Use respirator in accordance with manufacturer's use limitation and OSHA standard 1910-134 (29CFR).

Protective Equipment

- Wear eye protection (splash goggles where spilling or splashing may occur).
- Wear water resistant protective gloves.

SECTION IX - TRANSPORTATION

For domestic transportation purposes, this product is not known to be defined or designated as a hazardous material by the U.S. Department of Transportation under Title 49 of the Code of Federal Regulations, 1986 Edition.

- | | |
|-----------------------------|----------------|
| - DOT Proper Shipping Name: | Not applicable |
| - DOT Hazard Class: | Not applicable |
| - DOT Label: | Not applicable |
| - UN/NA Hazard No.: | Not applicable |
| - Reportable Quantity (RQ): | Not applicable |

SECTION X - HAZARD CLASSIFICATION

Federal

- SARA Title III (40CFR311/312) Hazard Category: Not known to be applicable.
- SARA Title III Section 313 Toxic Chemicals present at or above de minimus concentrations: None known.

State

While we do not specifically analyze these products, or the raw materials used in their manufacture, for substances on various state hazardous substances lists, to the best of our knowledge no such substances are present except those specifically listed below.

- California Proposition 65: "substances known to the State of California to cause cancer, birth defects or other reproductive harm": None known.
- Massachusetts Substance List: Ammonia* (I).

- New Jersey Workplace Hazardous Substance List: Ammonia *
- Pennsylvania Right to Know Act: (1) Contains trade secret chemical typically before the reporting concentration. (2) Ammonia* (I)

*Ammonia (C.A.S. 7664-41-7) is present at approximately 0.4%

International

MSDS # 020641

- Canadian Controlled Products Regulation (WHMIS): Not known to be applicable.
- Canadian Ingredient Disclosure List (WHMIS): None known in reportable amounts.
- European Economic Community: Not known to be applicable.
- European Economic Community EINECS: Monomers listed.

NFPA 704*

Health: 0
 Flammability: 0
 Reactivity: 0
 Special: None

HMIS**

Health: 1
 Flammability: 0
 Reactivity: 0
 Personal Protection: B (Goggles, gloves)

Key: 0 = Insignificant; 1 = Slight; 2 = Moderate; 3 = High; 4 = Extreme.

* National Fire Protection Association rating identified the severity of hazardous of material during a fire emergency (i.e., "on fire")

** Hazardous Materials Identification Systems, National Paint and Coatings Association rating applies to product "as packaged" (i.e., ambient temp.).

USER'S RESPONSIBILITY

This bulletin cannot cover all possible situations which the user may experience during processing. Each aspect of your operation should be examined to determine if, or where, additional precautions may be necessary. All health and safety information contained in this bulletin should be provided to your employees or customers. It is your responsibility to use this information to develop appropriate work practice guidelines and employee instructional programs for your operation.

DISCLAIMER OF LIABILITY

As the conditions or methods of use are beyond our control, we do not assume any responsibility and expressly disclaim any liability for any use of this material. Information contained herein is believed to be true and accurate but all statements or suggestions are made with out warranty, expressed or implied, regarding accuracy of the information, the hazards connected with the use of the material or the results to be obtained from the use thereof. Compliance with all applicable federal, state and local laws and regulations remains the responsibility of the user.

SAFETY IS NO ACCIDENT

PRE-JOB BRIEFING

Job Description/Title
S-102, REMOVE REMAINING EQUIPMENT

Date
4-23-08

Work Order No.:
CLO-WO-07-1840

Supervisor:
MW Johnson

Place a check mark in all that apply

* Use as applicable for General Pre-Job Briefings
Required for medium or high radiological risk work activities

Define the Work

- #*Work Scope
- *Purpose and nature of work
- #*Tasks and Critical Tasks
- *Tasks assignments
- *Procedural or Work Instruction Adherence/Use
- #*Roles and Responsibilities
- *Special qualifications or training
- Handoffs
- Controlling Authority
- Outside Resources Required

Hazards and Controls

- #*Review the Worksite Hazard Analysis (WHA)
- #*Discuss the controls and PPE identified in the WHA
- *Discuss the precautions in the work instructions
- *Discuss any warnings or cautions listed in the work instruction or procedure
- *Error Likely situations - *Work slow and deliberate*
- Discuss contingency plans
- #*Discuss the permits and their controls
- #*Discuss any ALARA aspects of the work *Lower dose rate area*
- Discuss Voluntary Use of Respirators
- Discuss engineered or administrative controls for Radiological Containments *Drapes, Damp rags*

Prerequisites

- #*Review the prerequisites listed in work instructions or procedures
- Review Communication requirements (What, Who, When) (Three-Way Communications)
- Tools, Materials, or Equipment required to be staged
- *Technical Specification Requirements (TSRs)
- *Limiting Condition for Operations (LCOs)
- *Valve Manipulation Walkdowns (see Pre-Job Briefing procedure)
- Oversight Requirements (Senior Supervisory Watch)

Special Requirements or Unusual Conditions

- #*Interface with other organizations
- *Potential Communication obstacles
- #*Other Work in the Area
- Changes in Scope or Work Conditions
- #*Procedure questions or errors
- Equipment line-up/configuration
- #Hold Points, and who is responsible to complete

Lockout Tag-out Requirements

- *Review Tagout Authorization and Tags
- Identify affected employees
- *Identify Authorized workers
- Identify Primary Authorized worker (if used)
- *Authorized Worker Lock and Tag
- *Personal Locking Devices

None

Abnormal Events

- #*Emergency Response
- *Alarm Response
- Location of Nearest:
 - o Spill Kit
 - o Operable Safety Shower
 - o Operable Decontamination facility
 - o Event response equipment, supplies, personnel
- *Roles and Responsibilities for Injury, Spills, etc.
- *Lessons Learned

Post Work Activities

- #*House Keeping/Final Cleanup
- *Post Maintenance Testing
- Post Job Reviews/Debriefs
- Post Job ALARA review

Comments

Supervisor signature and date indicates that all personnel have been briefed on the areas indicated by a check mark.

Supervisor Signature

MW Johnson

Date

4-23-08

**CH2M HILL
ATTENDANCE ROSTER**

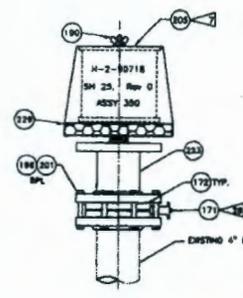
Subject:
CLO-WO-07-1840
S-102, REMOVE REMAINING EQUIPMENT

Date: 4-23-08

Leader:
M. Johnson

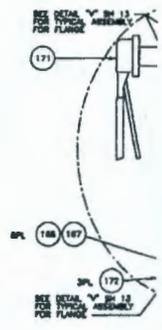
NAME (Print)	Signature	Position/Title	Organization
Bill Samson		NCO	BO.
R. Rimmer		NCO	BO
PA GONZALEZ		NCO	BO
N Brown		NCO	BO
Greg Seidel		NCO	1
Caylor		NCO	BO
Stamper		NCO	BO
Quinn		NCO	BO
A JOHNSON		HPT	BO
V. Wyant		HPT	BO
Ronald A. Simkins		PIF	MAINT
Vince Rhodes		HPT	BO
J Lucas		NCO	BO
JR Maasen		NCO	BO
Kim Jones		HPT	BO
Darin Jindy		PCT	BO
JEFF GRANT		INSULATOR	BO
Lee Roberts		HPT	BO

F
E
D
C
B
A



NOTE: USE EXISTING VALVE IF AVAILABLE, OR ITEM 171 IF NEW VALVE IS REQUIRED.

350 40 CFM BREATHER FILTER ASSY. W/4" VALVE FOR EXISTING 4"-150# FLANGES
SCALE: NONE



351 40 CFM BREATH REPLACING G-1
SCALE: NONE

237 40 CFM BREATHER FILTER ASSY. FOR EXISTING 4"-150# FLANGES SEE DWG 90718 SH 17 FOR ASSY.		350 40 CFM BREATHER FILTER ASSY. W/4" VALVE FOR EXISTING 4"-150# FLANGES USING LUGGED BODY BUTTERFLY VALVE		351 40 CFM BREATHER FILTER ASSY. W/4" VALVE FOR REPLACING G-1 OR OPEN FACE HEPA FILTER ASSY. USING LUGGED BODY BUTTERFLY VALVE	
QUANTITY	ITEM NO	QUANTITY	ITEM NO	QUANTITY	ITEM NO
1	190	1	190	1	190
1	205	1	205	1	205
1	229	1	229	1	229
1	223	1	223	1	223
8	166	8	196	8	196
8	167				
1	172	2	172	3	172
		1	171	1	171
				1	220
				8	167
				8	168
		8	201	8	201
				2	166

DWG NO		TITLE		REF NUMBER	TITLE	DATE	BY	CREATED PER ECH 724418 RD. 724418 A1
DRAWING TRACKABILITY LIST		NEXT USED ON H-2-90718 SH 1		REFERENCES		REVISIONS		

