

# EVENT INVESTIGATION REPORT

EIR-2016-024

Investigation of 702-AZ Room 105 AOP-015 Entry

\_\_\_\_\_  
Event Investigation Team Lead

*6/6/16*

\_\_\_\_\_  
Date

\_\_\_\_\_  
PER Responsible Manager

*6/6/16*

\_\_\_\_\_  
Date

PER No. WRPS-PER-2016-0908

**EIR-2016-024, “Investigation of 702-AZ Room 105 AOP-015 Entry”****Investigation Summary**

On Wednesday, May 4<sup>th</sup>, 2016, at approximately 1545, a Health Physics Technician (HPT) reported smelling ammonia and body odor-like smells while performing source check and filter paper changes at 702AZ. The source check and filter paper changes were being performed per TF-OPS-040, “*AY/AZ Farm and 702-AZ Air Inspections and Source Checks of Stacks and Annulus Effluent Record Sampler CAM(s)*” in support of Preventive Maintenance work order #172578, “*702-AZ VTP CAM Calibration Reinstall.*” At the time the odors were encountered, Industrial Hygiene Technicians (IHT) were performing Direct Reading Instrument (DRI) monitoring for Volatile Organic Compounds (VOCs), ammonia, and mercury and detected no elevated readings. The HPT then donned Self Contained Breathing Apparatus (SCBA), completed the source check, and notified the Field Work Supervisor (FWS) of the odors encountered and subsequent sore throat. The HPT was transported to Health Primary Medical Clinic (HPMC) for evaluation. The HPT was later released to return to work without restriction. The Central Shift Manager (CSM) entered into AOP-015, “*Response to Reported Odors or Unexpected Changes to Vapor Conditions.*” A bag sample was taken within the 702-AZ Continuous Air Monitor (CAM) cabinet and results were well below action limits. The CSM then exited AOP-015. Event Investigation Report EIR-2016-024 was initiated.

Document reviews, interviews, and a Fact Finding meeting were performed on Thursday, May 5, 2016. A review of the work activities indicate no waste disturbing activities were on-going at the time. However, the exhauster was running at the time the odors were encountered which would have provided a pathway to the tank head space. TF-OPS-040 is performed quarterly as a preventive maintenance activity and also in conjunction with routine preventive maintenance CAM calibration reinstallations.

TF-OPS-040, Rev. A-0, Section 3.1, states:

“3.1.1 Respiratory protection is required in conjunction with IHT monitoring when replacing air sample filters at primary exhausters.

3.1.1.1 Minimum required respiratory protection and voluntary upgrade is identified using on the of the following:

- Farm specific TVIS,
- Farm specific TVIS, SEG 3.”

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Typically, SEG 3 with SCBA is prescribed when performing the quarterly evolution as the exhauster is operating. Following the pre-job briefing on May 4, 2016, a question was raised why the Instrument Technical (IT) portion of the work was SEG 2 and the CAM source check portion was SEG 3. As such, the HPT, Radiological Control FWS, Industrial Hygienist (IH) and Maintenance FWS previously discussed the system configuration related to the work and Personal Protective Equipment (PPE) to be used for the source check portion of the work. Based on those discussions, it was thought by the Radiological Control FWS, HPT, and IH that the exhauster would be secured and valved out during the source check portion of the work. Therefore, SEG 2 respiratory protection was agreed upon for the CAM source check portion of the work activity. However, specific work instructions in Work Order #172578, Section 5 states:

- “5.6 **ENSURE** 702-AZ exhaust is restarted and returned to service.
- 5.7 **PERFORM** function test of RIAS-AZK1-1 per 3-RM-626 and ET-07033.
- 5.8 **REQUEST** HPT to perform source check per TF-OPS-040.
- 5.9 **REQUEST** HPT to install previously retained filter paper from step 5.2.
- 5.10 **INFORM** Shift Manager when testing is complete.”

Based on a preliminary review of the circumstances surrounding this event, potential causes appear to be miscommunication between the IH, Radiological Control FWS and Maintenance FWS which led to an inaccurate mental picture of the system configuration during the work evolution. The Radiological Control FWS, IH, and HPT were under the assumption that the ventilation was to be secured and valved out, therefore preventing a pathway to the tank head space. As such, a downgrade of PPE from SCBA was agreed upon. Additionally, the pre-job briefing for Work Order 172578, “702-AZ VTP CAM Calibration Reinstallation,” was not attended by the affected HPT, Radiological Control FWS, or IH. However, a follow-up separate pre-job was conducted with the affected HPT. Therefore, the scope of the CAM Calibration Reinstallation, expected facility configuration, and scope of the TF-OPS-040 was not discussed and/or understood by all involved parties.

At the time of the event, it was 79 degrees with humidity at 28%. Winds were out of the NW at 5 mph with gusts of 13 mph.

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- ~1000 A Pre-Job was held for Work Orders 172578, 172579, and TF-OPS-040.
- ~1100 Radiological Control FWS, Maintenance FWS, and IH discuss respiratory requirements for the CAM replacement and HPT source checks. A decision was made to downgrade respiratory requirements from SEG 3 to SEG 2 for HPT source check and paper change.
- 1215 The work crew assembled at 702AZ to begin work.
- 1247 The 702AZ exhauster was shut down to support CAM replacement (AZ ADM Logbook).
- ~1515 Instrument Technicians (ITs) complete CAM reinstallation and 702AZ exhauster is restarted.
- ~1530 ITs notify HPT that CAM replacement is complete, HPT begins source check/paper change. During this evolution there were 2 IHTs performing monitoring for VOCs, ammonia, and mercury. Once the HPT opened the CAM, she encountered an ammonia and body-odor like smells. The HPT then donned SCBA and completed CAM source check and filter paper change. The crew then exited the area and notified the FWS of odors.
- 1544 FWS reports that while performing 702AZ CAM source check and filter paper change following maintenance activities, an HPT smelled ammonia and body odor like smells (CSM Logbook).
- 1545 The 702AZ exhauster was restarted and A-Train CAM functional complete (AZ Logbook).
- 1548 The HPT was transported HPMC for evaluation.
- 1600 The Radiological Control FWS was notified of HPT employee being taken to HPMC.
- ~1600 CSM notifies IH of an AOP-015 event reported at 702-AZ.
- 1601 IH personnel arrive at Central Shift Office in response to AOP-015.
- 1602 IH instructs IHTs to pull one bag sample from inside 702-AZ, room 105. DRI instrumentation is to run continuously while bag samples are being pulled.
- 1603 AOP-015 entered for odors with symptoms in 702AZ CAM cabinet (CSM Logbook).
- 1604 IHTs dispatched to 702-AZ to collect bag sample.
- 1638 EIR-2016-024 initiated (CSM Logbook).

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~1800 HPT released from HPMC.

**5/5/16**

2059 Sample results for AOP-015 entry received. Results well below action limits, AOP-015 exited (CSM Logbook).

2311 AY/AZ IHT and HPT sweeps complete, Vapor Control Zone downposted (CSM Logbook).

**Immediate Actions Taken**

1. The CAM source check and filter paper change were completed on SCBA.
2. The area was exited.
3. The HPT was transported to HPMC for evaluation.
4. Ventilation was restored.
5. The AZ Team Area Manager briefed the AZ team personnel on this incident and the importance of understanding system configuration and changes prior to working in/on systems (completed on 5/5/16).

**Compensatory Measures**

None

**Discussion of Potential Causes**

Based on interviews and document reviews, the following potential causes were identified:

1. Miscommunication between the IH, Radiological Control FWS and Maintenance FWS led to an inaccurate mental picture of the system configuration during the maintenance evolution. The Radiological Control FWS, IH and HPT were under the assumption that the ventilation was to be secured and valved out therefore preventing a pathway to the tank head space. As such, a downgrade of PPE from SCBA was agreed upon.

**Preliminary Extent of Condition Review**

Review of the Problem Evaluation Request (PER) database indicates this is an isolated incident. Additionally, TF-OPS-040 is isolated to AY/AZ Farm and 702-AZ systems.

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**Discussion of Barriers That Could Have Impacted the Cause**

1. Pre-job briefing for Work Order 172578, “702-AZ VTP CAM Calibration Reinstallation,” was not attended by the HPT, Radiological Control FWS or IH. Therefore, the scope of the CAM Calibration Reinstallation, expected facility configuration and scope of the TF-OPS-040 was not discussed and/or understood by all involved parties.

**Recommendations/Proposed Corrective Actions**

1. Evaluate modifying work instructions in Work Order 172578, “702-AZ VTP CAM Calibration Reinstall,” to ensure ventilation is secured prior to step 5.8 to allow HPT to perform source check per TF-OPS-040 under SEG 2 respiratory protection, OR
2. Evaluate adding a pre-requisite to TF-OPS-040 to acknowledge the configuration of the ventilation system and don appropriate respiratory protection prescribed for the as-found configuration.

**Attachments (as they apply):**

1. Attachment 1 – Odor Response Cards (2 pages, 7-10)
2. Attachment 2 – Gas Chromatograph/Mass Spectrometer (GCMS) Sample Results (1 page, 11)
3. Attachment 3 – Fact Finding Meeting Attendance Roster (2 pages, 12-13)
4. Attachment 4 - 702-AZ Building Drawing (1 page, 14)

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Attachment 1  
Odor Response Cards

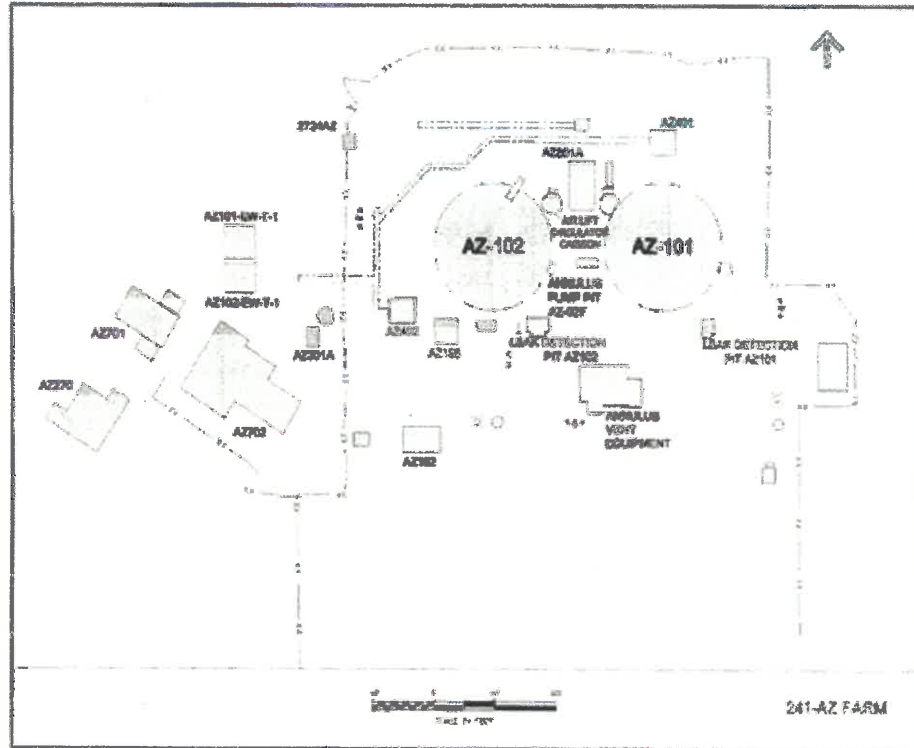
ODOR RESPONSE CARD - 241-AZ FARM

**Odors Detected with *NO* Immediate symptoms**

1. Notify Immediate Supervisor.
2. Contact Central Shift Manager, [REDACTED]. Provide the bulleted information below.
3. Complete map, return to Central Shift Office as soon as practicable.

**Odors Detected *WITH* Symptoms**

4. Notify Immediate Supervisor.
5. Contact CSM, [REDACTED], complete below bulleted information and map.
  - Your name and the work you were performing
  - Your symptoms (if any)
  - Date and time odor was noticed
  - Location of odors (mark area on map and the wind direction)
  - Describe the odor
  - Name of other in or near the affected area
  - Was an IHT present?
  - Possible source
6. Provide information on the back of card.
7. Send this card immediately to the Central Shift Office.



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Attachment 1  
Odor Response Cards

**ODOR RESPONSE CARD - 241-AZ FARM**

**1. Contact CSM, Complete below bulleted information and map.**

- Date and time odor was noticed 5/4/16
- Your name and the work you were performing PAPER CHANGING
- Location of odors (mark area on map and wind direction) A 702AZ ROOM 105 PRIMARY FLOOR
- Name(s) of others in or near the affected area \_\_\_\_\_
- Was an IHT present? Yes
- Describe the odor  Sweet  Sour  Musty  Earthy  Metallic  Smoky  Rotten  Onion  
 Cleaning Solution  Ammonia  Other: \_\_\_\_\_
- Possible Source CAN FILTER
- Your symptoms (if any)  Headache  Dizziness/Light-Headed  Nausea  Cough  
 Fatigue/Drowsiness/Weakness  Sore/Burning Throat  Difficulty Breathing  
 Watery/Irritated Eyes/Trouble with Vision  Tingling/Numbness/Paralysis  Rash/Itching  
 Other: NOT CURRENTLY SHOWING ANY

**2. Send this card to the Central Shift Office.**

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Attachment 1  
Odor Response Cards

**ODOR RESPONSE CARD - 241-AZ FARM**

Odors Detected with *NO* Immediate symptoms

1. Notify Immediate Supervisor.
2. Contact Central Shift Manager, [REDACTED]. Provide the bulleted information below.
3. Complete map, return to Central Shift Office as soon as practicable.

Odors Detected *WITH* Symptoms

4. Notify Immediate Supervisor.
5. Contact CSM, [REDACTED], complete below bulleted information and map.
  - Your name and the work you were performing
  - Your symptoms (if any)
  - Date and time odor was noticed
  - Location of odors (mark area on map and the wind direction)
  - Describe the odor
  - Name of other in or near the affected area
  - Was an IHT present?
  - Possible source
6. Provide information on the back of card.
7. Send this card immediately to the Central Shift Office.

241-AZ FARM

*RM 105 Beta Chem head area*

Wind Direction

N

W     E

S

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Attachment 1  
Odor Response Cards

**ODOR RESPONSE CARD - 241-AZ FARM**

**1. Contact CSM, Complete below bulleted information and map.**

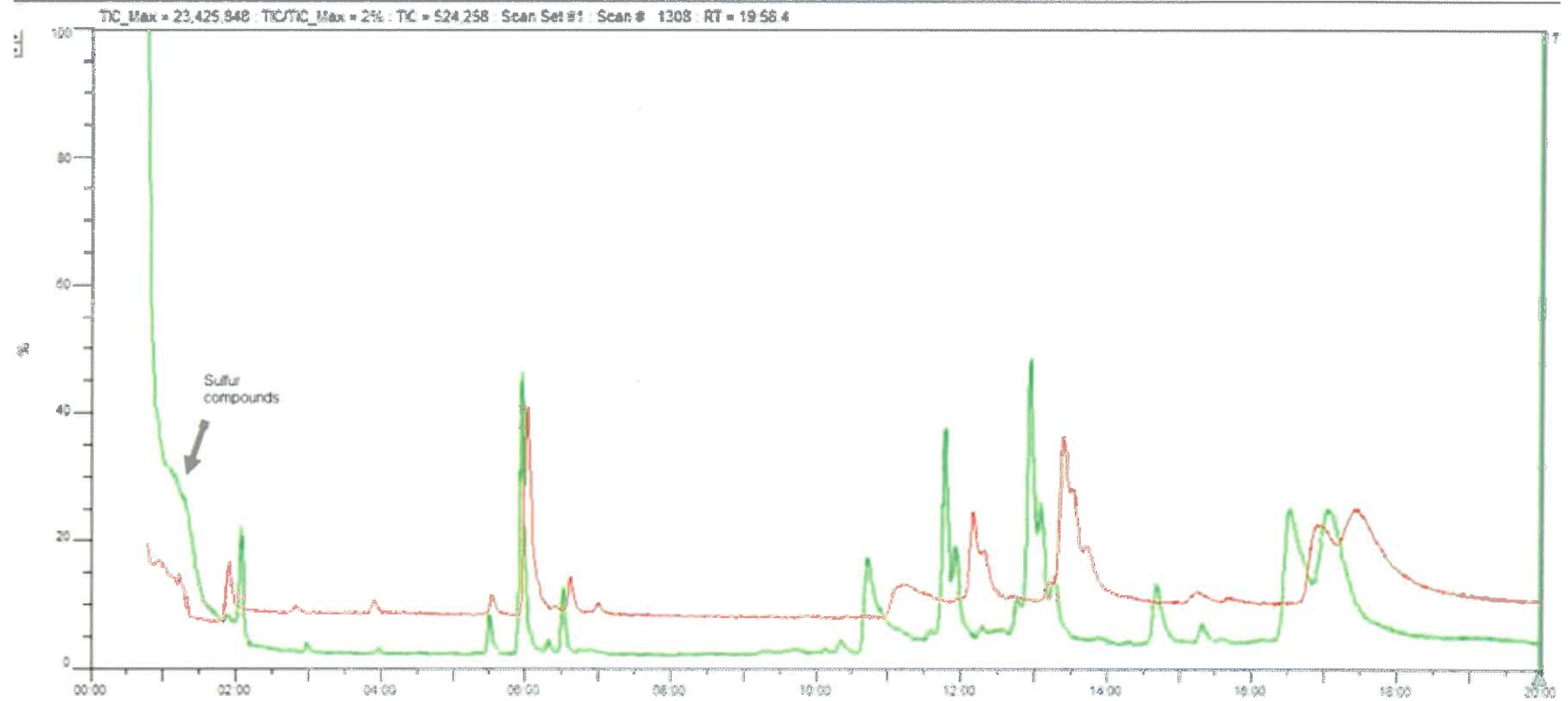
- Date and time odor was noticed 5/4/16 @ 15:30
- Your name and the work your were performing CAM charge out/OPS-40
- Location of odors (mark area on map and wind direction) 702 AZ Rm 105
- Name(s) of others in or near the affected area \_\_\_\_\_
- Was an IHT present? Yes
- Describe the odor  Sweet  Sour  Musty  Earthy  Metallic  Smoky  Rotten  Onion  
 Cleaning Solution  Ammonia  Other: \_\_\_\_\_
- Possible Source Primary Ventilation Sock AY/AZ
- Your symptoms (if any)  Headache  Dizziness/Light-Headed  Nausea  Cough  
 Fatigue/Drowsiness/Weakness  Sore/Burning Throat  Difficulty Breathing  
 Watery/Irritated Eyes/Trouble with Vision  Tingling/Numbness/Paralysis  Rash/Itching  
 Other: \_\_\_\_\_

**2. Send this card to the Central Shift Office.**

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**Attachment 2**  
**Gas Chromatograph/Mass Spectrometer (GCMS) Sample Results**

**b. GCMS Sample Results:**



No concerns were identified. Sulfur compounds were noted that may cause odors.

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Attachment 3  
Fact Finding Meeting Attendance Roster

Date:		EVENT INVESTIGATION ATTENDANCE FORM		
5/5/2016				
Event Title: <u>AOP-015 ENTRY FOR ODDS AT 702-AZ, ROOM 105</u>				
Event Number: <u>EIR-2016-024</u>				
Print Name	Signature	HID	Job Position	Organization
			IH	P.O.
			FWS	PO
			HAMTC <sup>P.O.</sup>	P.O.
			IHT	P.O.
			HAMTC SAFETY	P.O.
			sic Rep	DNFSB
			FR	ORP
			IHT	PO
			RCFLM	P.O.
			Planner	P.O.
			IHP	P.O.
			INST	P.O.
			INST	P.O.
			HPT	P.O.
			NCO	P.O.
			INST	P.O.



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Attachment 4  
702-AZ Building Drawing

