

EVENT INVESTIGATION REPORT

SY Farm AOP-015 Event
Event Investigation Report Number: EIR-2014-033

Event Investigation Team Lead

Date

12/2/14

PER Responsible Manager

Date

12/2/14

PER No. WRPS-PER-2014-1782

SY Farm AOP-015 Event

Investigation Summary

At 0943, Instrument technicians working in SY Farm performing sump levels at SY101 and SY102 noticed stronger than normal odors inside the farm and reported them to management. No symptoms were reported by the workers. Another work crew working inside and outside of SY Farm processing concrete for the pump pad removal also smelt the odors but reported that they were not stronger than normal. Central Shift Manager (CSM) entered AOP-015 and secured and restricted access to the tank farm.

The ventilation system in SY Farm was operating during the event.

All Employees from both work crews experiencing odors were asked if they were experiencing symptoms and each responded that they were not. The Employees were also asked if anyone needed to go to the site medical provider (HPMC) for evaluation. The employees agreed that there was no need to be evaluated. However, the two Health physics technician (HPTs) and one Industrial Hygiene Technician (IHT), that had been supporting the pump pad removal efforts and were retrieving air sample media from air samplers located outside of the tank farm when they smelt the odors, decided when relocating to the C-Farm, MO 1149 lunch trailer, to stop at HPMC for evaluation and blood tests. The workers were later released back to work without restrictions (restrictions were imposed by WRPS for the evaluated workers while waiting for blood test results).

During interviews with the instrument technicians, the technicians noted that although two of the three thought the odors were stronger than normal, the third thought the odor level was similar to that encountered routinely in SY Farm. Also, one of the instrument technicians noted that he believed that in the past, the odor encountered in SY Farm was more of a musty smell but that following the last transfer of waste into SY Farm from 219-S that the odor characteristics changed to more of a body odor type smell. The technicians noted that while in the farm that day they periodically checked the wind sock for wind direction and noted that there was a sort of a swirling effect and that the wind direction kept changing as many as five times during the time they were in the tank farm.

A Fact Finding Meeting was not held, but rather interviews and review of completed odor response cards was conducted.

Event Timeline

- 0910 Slight vapor smell in SY Farm reported by Instrument Technicians to SY Farm Area Day Shift Manager (ADM). Workers requested to fill out odor response cards.
- 0940 SY ADM logged "CSM entered AOP-015 for SY Farm due to multiple personnel smelling odor."
- 0943 CSM logged "Entered AOP-015 for stronger than normal odors inside SY farm, [redacted names], were performing sump levels @ SY101 & SY102. No Symptoms & declined medical. Shift Office Event Notification (SOEN) & Radio announcement complete."
- 0948 AOP-015 was called out over the radio and the Laborer General Foreman (GF) on the pump pad removal work called the crew out of the farm and made notification to the Field Work Supervisor (FWS).

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- 0950 FWS notified SY farm shift manager that the crew was coming out of the farm and FWS would call back once all personnel were accounted for.
- 0952 FWS waited for the crew to exit the change trailer and all personnel were accounted for.
- 0954 Industrial hygienist (IH) arrive at shift office for AOP-15 at SY Farm
- 0955 FWS asked if any personnel smelled any unusual odors or symptoms. Two HPT's and two IHTs said they smelled odors but nothing unusual, the IHT had done sampling in the farm per the work package and did not have indications on the direct reading instruments (DRIs) when in the farm. FWS asked if anybody needed to go to HPMC for blood work, all agreed that there was no need for blood work due to no symptoms or unusual odors.
- 0956 IH texted on scene at SY farm change trailer.
- 0956 IH went to inform mask station of SCBA needed for IHTs responding to Abnormal Operating Procedure (AOP).
- 0957 IH received odor response card at shift office.
- 0958 IHTs report to shift office.
- 0959 CSM notified DOE Facility Representative and Senior Management
- 1003 IH leave shift office to help respond.
- 1009 CSM logged "Initiated an event investigation for SY AOP-015. POC SOEN & DOE FR Complete."
- 1011 FWS notified shift manager that all personnel were accounted for and four crew members smelled odors but exhibited no symptoms and opted not to get blood work at HPMC.
- 1012 IHTs Get Self-contained breathing apparatus (SCBA) from mask station
- 1015 CSM logged "American Electric crew was working inside SY Farm and also smelt odors, but not stronger than normal. Two HPTs [names redacted] being taken to HPMC w/no symptoms. 2 IHTs, 3 laborers, 1 operator & 1 teamster all had no symptoms. IHTs were performing sampling & had no detectables."
- 1016 IH leave mask station in route to SY Farm.
- 1020 CSM notified Safety & DOE FR of HPTs taken to HPMC.
- 1025 The wind shifted and put the crew downwind of SY Farm so FWS and American Electric Inc.(AEI) safety representative instructed the crew to move to a different location so the crew was instructed to report to the lunch trailer at C-farm MO 1149 for precaution.
- 1027 IH arrives at SY change trailer and gives instruction to responding IHTs.
- 1045 IHTs enter SY Farm to start sampling and pulling bag samples.
- 1049 The crew then relocated at MO 1149 and FWS was told that that two HPTs decided they wanted blood work so they were dropped off at HPMC. AEI safety rep notified a WRPS Safety Representative that two HPTs were at HPMC. The two IHTs filled out the odor response cards and the crews were released to their managers.
- 1104 IHTs finish second bag

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- 1107 IHTs are finding trace amounts of volatile organic compounds (VOC's) instructed to continue investigative sampling.
- 1115 IHTs exit farm.
- 1142 HPTs clear instrumentation and bags from SY Farm.
- 1143 Leave SY change trailer to take bags to 2704HV.
- 1150 Arrive at 2704HV with bag samples.
- 1154 Bags turned over with DRI # and readings on the bag.
- 1210 Ran lumex and miran on the three bags taken in the field.

The following excerpts taken from IH Report TF-AOP-015 dated 0952/9-24-14, "South of SY Change Trailer. Inside Farm"

Summary of IH Monitoring and Sampling Data:

a. Monitoring

AGENT	@ODOR	@SOURCE	EXPOSURE LIMIT	REPORTING LIMIT
Ammonia	0,0,0 ppm	N/A ppm	25 ppm OEL/35ppm STEL	>0 ppm
Total VOCs	.3,.6,.7 ppm	N/A ppm	2 ppm AL	>0 ppm
Mercury	≤.005 mg/m ³	N/A mg/m ³	0.025 mg/m ³ OEL	0.000016 mg/m ³
Nitrous Oxide	<det ppm	N/A ppm	25 ppm AL	>0 ppm

b. GCMS Sample Results: Pending, but verbal that not much above background

c. Sampling:

- Source Yes No
- Area Yes No
- Personal Yes No

Weather Conditions at Time of Event:

- Wind Direction & Speed: Light and variable, shifting 0-3 mph
- Barometric Pressure (steady/rising/falling): Rising from 0600-1200, leveled off
- Temperature (oF): 68

Other:

Survey #14-06367 was from Co-located work in SY Farm. Core sampling was taking place with IHT support. Less than detectable for both VOC's and NH3.

Survey #14-06389 was from Co-located work just East of SY Farm in construction area. Unknown of the exact location of the IHT from the HPT's from above. Less than detectable for both VOC's and NH3.

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1224 Bag #1 starts to be run on hapsite

Additionally, the following information provided by IH following HAPSITE Evaluation:

Three bag samples were brought from the AOP-15 event in SY Farm.

These came from:

10 feet S of SY Change Trailer 0.35 ppm VOC's

Pump pit SY-01A 0.57 ppm

Cabinet SY026 0.7 ppm

All chromatograms were very similar, and an overlay was generated and attached.

The highest concentration sample, the cabinet was estimated for individual concentration.

The identifications of peaks was quite typical for background samples in the Tank Farms.

While several aldehydes were identified, the majority of the concentration was in the heavier, long chain aldehydes which have a less unpleasant odor.

There was an unidentified peak at the front of the chromatograms.

This may have been a merged peak of ethylamine + something.

The small total quantity makes separation of peaks difficult, if not impossible.

There is an interesting difference in the reported VOC via ppbRAE and the amounts observed by GC-MS. In the case of the estimated Cabinet sample, a factor of 10 X.

Normally, the match-up is much closer, perhaps only twice or triple.

This may indicate significant quantities of highly volatile short chain such as butane and isobutane

I cannot be certain that I separate all of these compounds from the air, CO₂, argon complex at the front.

These two chemicals have response factors of 67 and 100 relative to isobutylene function check gas.

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Item two was not pursued but a review will be recommended as part of follow on corrective actions that may come out of the resolution of WRPS-PER-2014-1782.

As a result, the following table provides the potential common factors reviewed and the results of that review including the items of interest noted above. Other factors may contribute such as barometric pressures but were not reviewed as part of this report.

Common Factor Reviewed	EIR-2014-033 (9/24/14)	EIR-2014-018 (05/29/14)	EIR-2014-020 (06/16/14)	EIR-2014-029 (08/27/14)	EIR-2014-030 (09/15/14)
<i>Notable Tank Level Change during event</i>	<i>No notable tank level change</i>	<i>No notable tank level change</i>	<i>No notable tank level change</i>	<i>No notable tank level change</i>	<i>No notable tank level change</i>
<i>Wind Speed and Direction Reported</i>	<i>5-13 mph W/SW</i>	<i>4.7-8.1 mph SSW</i>	<i>12-20 mph SW</i>	<i>5-15 mph SW</i>	<i>3-5 mph N/NW</i>
<i>Stack Operational and Flow Rate (Range: 950 to 1050 cfm)</i>	<i>Operational 951 scfm</i>	<i>Operational 970 scfm</i>	<i>Operational 953 scfm</i>	<i>Operational 974 scfm</i>	<i>Operational 958 scfm</i>
<i>Odor Location Reported</i>	<i>North of Annulus Pump Pits 02B and 01B and</i>	<i>Change Trailer Platform</i>	<i>Outside of Tank Farm near Change Trailer</i>	<i>Near SY102 near Core Sample Platform</i>	<i>Outside of tank farm near pump laydown area and within tank farm near change trailer</i>
<i>Odor Reported</i>	<i>Sweet Mothball, Sweet Chemical Smell, Onion, Body Odor</i>	<i>Onion</i>	<i>Onion</i>	<i>Odor "type" not recorded</i>	<i>Sweet, Mothball, Onion</i>
Commonalities Noted	<ul style="list-style-type: none"> • <i>No notable tank level change in SY Farm that would indicate a potential gas release event during the AOP-015 events</i> • <i>Wind directions out of S/SW with one exception</i> • <i>SY Farm Ventilation Operational and within specification</i> • <i>Onion type odor reported</i> 				

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Discussion of Potential Causes

Based on interviews with workers and review of information provided on odor response cards by workers, the assumed source of the odors is from the SY Farm exhaust stack.

Recommendations/Proposed Corrective Actions

No additional corrective actions are proposed or recommended as a result of this event investigation.

Further corrective actions will be evaluated as a result of resolution of WRPS-PER-2014-1782. As part of the evaluation of corrective actions it is recommended that the RM consider an action for engineering to evaluate potential impact to HEPA filters on SY-102 ventilation system due to moisture in the head space and resulting ventilated tank air through the air abatement system

Lessons Learned

To be addressed, if required, by the causal analysis via a corrective action under WRPS-PER-2014-1782.

Attachments (as they apply):

1. List of personnel contacted and/or Odor Response Cards or Email Statements Provided.
2. Log Book Entries

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Attachment 1

List of personnel contacted and/or Odor Response Cards or Email Statements Provided

-
- (Interview and Odor Response Card)
- (Interview and Odor Response Card)
- (Interview and Odor Response Card)
-
-
-
- (Interview and Odor Response Card)
-
- (email dated 09/25/14)
- (email dated 09/25/14)
- (email dated 09/25/14)
- (email dated 09/24/14)
- (Odor Response Card)
- (Odor Response Card)
- (Odor Response Card)

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Attachment 2
Log Book Entries

- 9/24/14 D-Shift
- 0943 Entered AOP-015 for stronger than normal odors inside SY Farm, (HPTs) ? were performing Sump levels @ SP101 & SP102. No symptoms & declined medical. SDEW & Radio Ann. Complete.
- 0959 Notified DOE FR & Sr. Mgt.
- 1009 Initiated an Event Investigation for SY AOP-015. POC & FR. SDEW & DOE complete.
- 1015 American Electric crew was working inside SY Farm and also smell odors, but not stronger than normal. Two HPTs ? being taken to HPAC w/ no symptoms. 2 HPTs, 3 Laborers, 1 operator & 1 teamster all had no symptoms. HPTs were performing sampling & had ~~no~~ ^{no} detectables.
- 1020 Notified Safety ? DOE FR of HPTs taken to HPAC.
- 1057 was released to return to work w/o restriction.
- 1110 TNAcs reports 702-AZ Stack Hi Temp alarm notified.
- 1127 AP107 to AW102 transfer secured
- 1154 AP107 Admin lock installed.
- 1237 Initiated temp round CSO-TR-70 for POROL seal pot level checks.
- 1312 AP107 to AW102 flush & drain about to be
- 1332 LATE ENTRY ~ 1230 The two HPTs were released to return to work w/o restriction. SDEW complete.

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9-22-14 ST Team

9-22-14 0940 LOW truck exited S/SX farms.

1016 Cask truck exited SY farm with final sample out of SY102 Riser 02.

1223 Secured under instructions.

1315 Review of rounds indicate that S Farm Change Trailer PCM and T Farm Change Trailer PCM are out of service.

1318 Low truck enter TX Farm.

1321 S Farm PCM back in service.

1445 Low exiting TX Farm.

1544 Relieved by CSM.

9-23-14 0510 Assumed ST ADM Duties.

0530 Assumed ADM under instruction.

0930 T Farm PCM-1B returned to service.

1432 80T Crane has exited SY farm.

1432 Secured under instruction.

11610 Relieved by CSM.

9-24-14 0515 Assumed ST ADM.

0530 Assumed ADM under instruction.

0815 SY Construction forces is posting SY change trailer for flying debris. Need to be on Construction JDA to use SY change trailer.

0910 Slight vapor smell in SY farm. Filled out Vapor card. No symptoms or issues with workers involved.

0915 SSW overseeing sampling work in SY farm fall and is being taken to HPMC by Sampling FWS. Some hip pain associated with the fall.

0940 Upon further review, CSM entered AOP-15 for SY farm because of multiple personnel smelling the odors.

1630 Secured under instruction.

1655 Relieved by CSM.

9-25-14 0510 Assumed ST ADM Duties.

0530 Assumed ADM under instruction.

1246 Man lift arksen SY Farm