EVENT INVESTIGATION REPORT

AW02E AOP-015 Event on 11/20/2014
Event Investigation Report Number: EIR-2014-046

Event Investigation Team Lead

PER Responsible Manager

PER No. WRPS-PER-2015-2205

12/10/14
Date

12/10/14
Date
Investigation Summary

On Thursday, November 20, 2014, a Nuclear Chemical Operator (NCO) was performing surveillance activities in AW farm looking for heater configuration in various established warming tents. When the NCO entered the tent at AW 02E, the NCO encountered an odor described as “strong onions” and exited the tent. The odor was reported to management and AOP-015 was entered.

The NCO stepped within the warming tent at AW 02E and inhaled. The NCO immediately encountered the “strong onion” smell and immediately exited. The NCO described feeling “light headed”. The NCO stated that after taking about two breaths of fresh air outside the tent, the NCO “felt fine”. The NCO notified his management. The NCO’s manager sent an escort to the NCO to take him to Occupational Medical Services (HPMC) who arrived within minutes of the call. The NCO filled out an Odor Response Card. The NCO was evaluated at HPMC and returned to work without restriction.

Subsequent Industrial Hygiene samples were analyzed and data collected with no analyzed chemical above action levels. Operations initiated a “Red Arrow” logbook entry which states “Entry into DST (double shell tank) valve pit tent enclosures required IHT (Industrial Hygiene Technician) coverage or SCBA.”

Tank ventilation was running. There was no appreciable change in tank level or pressure and the wind was calm.

A Fact Finding meeting was not held. A personnel interview was conducted, odor response card was reviewed and data gathered.

Event Timeline

November 20, 2014

1345 NCO entered tent AW-02E and encountered odor of “strong onions”.

1346 NCO reported events to management.

1348 Escort arrives to take NCO to HPMC.

1350 AOP-015 entered.

1358 Industrial Hygiene support arrives at Central Shift Office.

1359 Event Investigation Initiated.

1405 NCO arrives at HPMC.

1425 NCO blood sample is drawn

1431 IHTs enter AW farm and perform monitoring and sample collection.
1500 IHTs exit AW farm and return to laboratory to analyze samples and perform HAPSITE analysis.

1539 Initiated Event Investigation

1831 HAPSITE analysis complete.

1930 Samples analyzed with no results above action levels. HAPSITE analysis did indicate a total VOC of .036 ppm (exposure limit of 2ppm). AOP-015 for AW farm exited.

1943 AW farm downposted from AOP-015 conditions. AOP-015 exited.

11/21/2014

1546 Central Shift Operations initiated a “Red Arrow” logbook entry stating “Entry into DST valve pit tent enclosures required IHT coverage or SCBA.”

11/24/2014

0945 Central Shift Operations Revised “Red Arrow” entry from 1/21/2014 1546 to “The enclosures set up over the top of DST pits will be considered Low Threshold Vapor (LTV) areas and the LTV requirements will be applied.”

Compensatory Measures

1. Entered AOP-015
2. Restricted access to AW farm
3. IHT planned and executed IH sample plan.
4. Initiated “Red Arrow” logbook entries requiring treatment of the enclosures as Low Threshold Vapor areas.

Preliminary Extent of Condition Review

If the tent is a contributor to retaining the odor, there are three total warming tents in AW farm and more may be present in other locations.

Discussion of Potential Causes

Cause is indeterminate from the information available.

Discussion of Barriers That Could Have Impacted the Cause

Indeterminate
Recommendations/Proposed Corrective Actions

1. Consideration should be given to incorporating the “Red Arrow” requirements into the General Hazards Analysis.

2. Consideration should be given to evaluating the source of an “onion-like” odor that has been reported in several events at AW Farm. Prior events included workers detecting similar odors upon opening cathodic protection systems remote from the valve pit for this event.

3. Consider reviewing the enclosure configuration with the elephant trunk type ducting to determine if there is any effect on the air quality, movement, exchanges within the enclosure not accounted for.

Lessons Learned

To be addressed, if required, by the causal analysis via a corrective action under WRPS-PER-2014-2205.

Attachments (as they apply):

1. List of personnel contacted
2. Log Book Entries
3. Weather Information
4. Stack Flow
5. Ventilation Flow
6. Odor Response Card
7. Industrial Hygiene Report

*Words in italics for explanatory purposes only, delete upon completion of report.*
Attachment 1
List of Personnel Contacted

1. AW farm NCO
2. EV Farm Area Dayshift Manager
11/26/14
D. Smith
1215 - Described the handling and/or cleaning of used respiratory equipment, other than your own unless you have received the USE SAFETY SUBCONTRACTOR was taken to HPAC and
1117 - Update to 10/15 meeting. The PPE's are

THE RESPONSIBILITIES FOR USING THE EOD PROGRAM
WILL BE A CHANGE TO TABLE 1 of USE-SHOC-11-10-14
LOWER RIGHT BOX TO READ "HANDLING AND/OR CLEANING"
MAKE SURE TO PROVIDE NOZLE TO EXCHANGE POUCH
MOUNTING, SPRINT SHOT AND, NO
NOTIFIED PER-R2 1/14.
1223 - Update to 11/20 entry.

RETURN TO
WORK, WORK, NOT RECOGNIZE, SPRINT SHOT, NONWORD AND
UNNOTICE.
1245 - A null safety subcontractor was taken to HPAC and
TRANSPORT TO AMBULANCE TO HPAC FOR AN INJURY SUFFERED OFF SITE OF A involving
HEIGHT FALL AT WORK.
NOTIFIED HIS COMPANY.
WEBCAST CONSULTANT SERVICES. SPRINT SHOT,

NOTIFIED.
1257 - NOTIFIED BY GPA THAT THE DAILY HUT IS ON PERP RIVER
AND SHOULD BE RESOLVED TO SPRINT SHOT. DAY 8 HPAC SHOULD
NOT AFFECT TRAFFIC SERVICES.
1310 - RY-2 FROM JS BACK ON SERVICES.

1350 - ENTERED AOP-015 FOR COUNTER POLES ON AOP-14 PER BOX
SUNDERED BY, NOT CHANGING DURING, NO TO
BEKET (PROCESSED TO HPAC FOR EVALUATION). ALL CALL FROM
SPRINT SHOT,

NOTIFIED. HPAC ARE PROCEDING
SMARTS PER AOP-015 FOR PARK USES,

1431 - RECOVERY PLAN # BO-RP-14-06 ISSUED FOR 5Y 1/5 RP
TURN 40 11/16/12.
1539 - Event investigation 2014.4.6 was initiated for the AW02 AOP 015 Entry, POC.

1622 - C: Retrieval access is back in service.

1721 - External pump maintenance for an NTP survey remained to complete on 11/30/14 as indicated in an item 106.

Rec: AN-402, P&ID 251A, P&ID Control Chart SR-3.1.3A
Rec: SR-3.1.3B, SD audience

1735 - Replaced as CSA by

1752 - Assumed duties as CSA

1932 - Sample analysis for the AW Form AOP-05 event is complete and the results are at or below background levels. Disposition NCE to downplay AW Form S0081x1, radio

1943 - AW Form has been downplayed, routine access requested.

1944 - Not, S0081x1 (Sr. Engineer) and left lane is for end (Deed)

2135 - CR-2 reports an AW Form A-1.60 temp.

annulus cabinet 904 alarm. Alarm will not clear, verified heater is operating, doors closed, and leakers closed per PGR.

11/21/14 Crisi

0031 - CR-2 increased AW NTP fan speed to 2000

rates to bring that pressure back with normal rate.

0040 - Retired as CSA by

0040 - Retired as CSA

0100 - Supply truck into AW Form per route map and spots.

include strike verified control.

0131 - Supply truck out of AW Form

Site PER03 exhaust wasted for maintenance.
### Tower Information

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**Delta T1 = T200 - T1 = 6.6**  
**Pasquill Category = E**  
**Delta T2 = T250 - T50 = 0.4**  
**200 ft Winds = 3:3**  
**Delta T3 = T200 - T50 = 0.5 (NRC)**  
**Least Dilution = 99.9 ALOFT**
AW02E AOP-015 Event on 11/20/2014

Attachment 6
Odor Response Card
Odor Response Card

1. Contact CSM, complete below bulleted information and map.
   - Your name and the work you were performing: checking Temp & heaters
   - Your symptoms (if any): dizzy - immediately
   - Time odor was noticed: 1345 - 11/20/14
   - Location of odors (mark area on map and wind direction): No wind (02E pit)
   - Describe the odor: onions - strong
   - Name of others in or near the affected area: None
   - Was an IHT present? No
   - Possible source: Pit cover cracks

Odor Response Card

2. Submit this card to the Central Shift Office.

3. Complete map, return to Central Shift Office as soon as practicable.

4. Notify Immediate Supervisor.
5. Contact CSM, complete below bulleted information and map.
   - Your name and the work you were performing
   - Your symptoms (if any)
   - Time odor was noticed
   - Location of odors (mark area on map and wind direction)
   - Describe the odor
   - Name of others in or near the affected area
   - Was an IHT present?
   - Possible source
6. Provide information on the back of card.
AW02E AOP-015 Event on 11/20/2014

Attachment 7
Industrial Hygiene Report

Washington River Protection Solutions

TF-AOP-015 INDUSTRIAL HYGIENE INVESTIGATION REPORT

Time/Date & Event location:
11/20/2014, 12:00 PM, 1206 BST

1. Event Summary (including number of workers involved and activity in progress): 1 operator inside AW farm was performing routine surveillances checking pit and tent temperatures. No valve or system manipulation was taking place.
   - Was an IHT Present? [ ] Yes [X] No
   - Was Respiratory Protection Being Worn by Affected Worker(s)? [ ] Yes [X] No

2. Summary of Employee Reported Information (e.g., symptoms):
   - Attach Completed Odor Response Card

3. Identification of Source of the Concern: [ ] Yes [ ] No

4. Time Line of the Event:
1345: Employee experienced odor
1355: SOEN "Entering AOP-015 for odors in AW Farm, CSM"
1358: 2 IHT, 2 HSM, IHTS arrive at CSM
1359: 2 IHT, 2 HSM, IHTS briefed by CSM: Employee smelled onion odor and experienced dizziness in AW02E Pit tent. Odor response card not yet completed. RBA in tent. Affected employee on route to SOMC in 200W
1401: IHT's briefed on odor response by HSM with IHT concurrence and leave CSM to mask station to acquire SCBA
1406: CSM confirmed that no personnel were currently in the farm.
1408: IHT informed that odor response card was being completed by affected employee while in route to SOMC in 200W
1412: IHTs leave CSM to report to AW change trailer
1415: IHTs and CSM briefed by AW IHT that the system contained by the tent is part of the transfer system and is a potential leak point when transfers are taking place.
1418: CSM notified by phone that affected employee was checking pit and tent temperatures. No valve or system manipulation was taking place.
1431: IHTs enter farm to perform monitoring and collect bags for analysis.
1500: IHTs exit farm, return to lab to start processing field data and HAPSite analysis.
1815: HAPSite analysis complete.

5. Summary of IHT Monitoring and Sampling Data:
   a. Monitoring: IHT's collected two bags for analysis inside O2E tent, also swept farm before exiting. Field readings are reported below. DRI-14-07643.

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<tr>
<th>AGENT</th>
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<td>Ammonia</td>
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<td>ppm</td>
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<tr>
<td>Total VOCs</td>
<td>0ppm</td>
<td>036ppm</td>
<td>2 ppm Al</td>
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<td>Mercury</td>
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<td>Nitrous Oxide</td>
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<td>25 ppm Al</td>
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   b. GCMS Sample Results: The bag brought from AW farm contained trace amounts of solvents and background. The amount of VOCs found by the HAPSite was ~36 ppb. The identity of the small peaks in the 3 to 8 minute range indicates use of solvents. No compounds with a known "onion" odor were identified.
**TF-AOP-015 INDUSTRIAL HYGIENE INVESTIGATION REPORT**

**Time/Date & Event location:**
1345/Mov 20th, 2014, AOP-15 AW-02E Pit Tent

**c. Sampling:**
- **Source**: [ ] Yes [x] No
- **Area**: [ ] Yes [x] No
- **Personal**: [ ] Yes [x] No

**6. Weather Conditions at Time of Event:**
- **Wind Direction & Speed**: NW 3mph
- **Barometric Pressure**: (steady/rising/falling) 29.33 at 1300, 29.32 at 1400, 29.32 at 1500
- **Temperature (F)**: 50 degrees

**7. Recommendations/Conclusions:** Analysis of the field data and HAPSITE show no significant readings that would correlate to strong onion smell. This tent is accessed frequently to check heaters, monitor temperatures, etc.

**8. Other**: N/A

**9. IH Monitoring/Sample Survey Reports:** DR-14-07643 can be accessed for field/HAPSITE analysis data.

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