INITIAL EVENT INVESTIGATION REPORT
EIR-2017-002

“EVENT INVESTIGATION REPORT, EIR-2017-002, 702-AZ SAMPLE CABINET
TF-AOP-015 EVENT”

Consisting of 35 pages
Including cover sheet
EVENT INVESTIGATION REPORT

Event Investigation Report, EIR-2017-002, 702-AZ Sample Cabinet
TF-AOP-015 Event

Event Investigation Team Lead Under Instruction

Event Investigation Team Lead

PER Responsible Manager

PER No. WRPS-PER-2017-0202

3/16/17 Date

3/16/17 Date

3/16/17 Date

Page 1
TF-AOP-015 for Odors Reported Outside AY-1 Change Trailer

TF-AOP-015 Summary

<table>
<thead>
<tr>
<th>Event</th>
<th>702-AZ CAM (continuous air monitor) Sample Cabinet TF-AOP-015 Event</th>
</tr>
</thead>
</table>
| Date/Time of Event | • January 26, 2017  
• ~1300 hours |
| Location | • Inside the 702-AZ Instrument Building  
o Outside the CAM Sample Cabinet  
o Inside the CAM Sample Cabinet  
• Southwest of Tank AZ-102 |
| Personnel Affected | • Three (3) WRPS personnel detected abnormal odors |
| Odor / Taste | Inside the NE side of CAM Sample Cabinet:  
• Burnt rubber  
• Burnt wire  
• Hot electrical  
Inside the SW side of CAM Sample Cabinet:  
• Ammonia |
| Symptoms | • Zero (0) symptoms experienced |
| Direct Read Instrumentation (DRI) Result During Event | • Ammonia: 0 ppm  
• VOCs: 0 ppm  
• Mercury: 0.00 mg/m$^3$ |
| Industrial Hygiene (IH) Investigative Monitoring / Sampling | Monitoring and Sampling data results were at levels non-detectable:  
• Ammonia: 0 ppm  
• Total VOCs: 0 ppm  
• Nitrous Oxide: 0 ppm  
• Mercury: 0.00 mg/m$^3$ (odorless)*  
*No odor thresholds to report |
| Possible Source | • Cabinet: Equalizing cone – possible source of ammonia odor  
• Building HVAC (Air Handling Unit): Unit is directly above Room 105 on the roof of the facility – possible source of electrical burning odor |
| Wind Speed / Direction | • Not applicable |
Temperature
- Below normal for January: between 1/23/17 and 1/26/17 temperatures were hovering at or below freezing

Work in Adjacent Area
- CAM Filter Paper Change had been performed two days prior
- Millwrights were in the facility on another activity

Investigation Summary
An Event Investigation was initiated at 1315 hours on 26 January 2017 after three (3) WRPS Instrument Technicians experienced abnormal odors while performing calibration activities within Room 105 of the 702-AZ Facility. Upon entering the investigation, the Office of River Protection (ORP) Facility Representative was informed. Interviews with the affected parties were held over the next several days, and an official Fact Find Meeting was not deemed necessary.

On the afternoon on 26 January 2017 at approximately 1300 hours, three Instrument Technicians were returning to work after lunch to perform calibration activities within the CAM Sample Cabinet. The technicians were in Room 105 on the northeast of the CAM Sample Cabinet when they experienced odors that they described as a “burnt rubber or wire” and an “overheated motor”. One of the technicians went to investigate the valve side of the CAM Cabinet and opened up the southwest doors and discovered a strong ammonia type odor. The technicians could not determine the source of the odors and initiated a SWIM response. The Shift Office was notified by the AY/AZ Area Day Shift Manager (ADSM) at 1311 hours.

The Instrument Technicians filled out Odor Response Cards and reported that they experienced no physical symptoms after detecting the odors. They all declined medical evaluations. An Industrial Hygiene (IH) Investigation was initiated and access to the area was restricted and controlled by a Nuclear Chemical Operator (NCO).

According to testimony by the Instrument Technicians, there was no apparent electrical activity that could have contributed to the event other than the building’s HVAC (Air Handling Unit). Temperatures had been below normal for January and the Instrument Technicians reported that one 702-AZ exterior door had been propped open and the interior doors leading to Room 105 were open. They reported that the ventilation system seemed to be operating normally. There had been a CAM Filter Paper Change that occurred two days previously. There was an initial concern that perhaps a valve had been left open. Industrial Hygiene Technicians (IHTs) were dispatched to investigate and found the valve to be in the closed position.

The IHTs performed direct read instrument (DRI) sampling on grab air samples. The DRI instruments did not detect ammonia, hydrogen sulfide, or volatile organic (VOC) constituents. Bag samples were taken and later analyzed by Gas Chromatograph Mass Spectrometer (GCMS). Nothing above background levels was determined and no action levels were exceeded. Refer to the Industrial Hygiene Investigation Report (Attachment 1) for more information.

At 1650 hours, the Central Shift Manager (CSM) was notified of the sample results, and TF-AOP-015 was exited. 702-AZ was returned to service at 1836 hours.
Figure 1 – 702-AZ Instrument Building and Room 105; where Odors were detected

Legend

Two (2) Instrument Techs detect a “burnt/hot electrical smell” at northeast side of Sample Cabinet

One (1) Instrument Tech detects a “burnt/hot electrical smell” at northeast side of Sample Cabinet and then detects an “ammonia” odor at southwest side of Sample Cabinet
Event Timeline

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Sequence of Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>01/26/17</td>
<td>@1300</td>
<td>Three (3) WRPS Instrument Technicians who are working in Room 105 of the 702AZ Building open the NE CAM Sample Cabinet doors to perform CAM calibration activities when they experience an abnormal “burnt rubber or wire” and “overheated equipment, seized motor” smell.</td>
</tr>
<tr>
<td></td>
<td>@1300</td>
<td>One (1) of the three (3) Instrument Technicians goes to the other side of the CAM Cabinet and opens up the SW cabinet doors and experiences a strong Ammonia odor.</td>
</tr>
<tr>
<td></td>
<td>@1300</td>
<td>The Instrument Technicians initiate SWIM and inform the AY/AZ Area Day Shift Manager (ADSM), Ken Anderson.</td>
</tr>
<tr>
<td>1311</td>
<td></td>
<td>AY/AZ ADSM notifies the Shift Office that 3 Instrument Techs reported a burning electrical and ammonia odor in 702-AZ Room 105 (Sample System Room). They reported no visible indications of fire. Instrument Techs went to 271-AZ. No symptoms reported.</td>
</tr>
<tr>
<td>1317</td>
<td></td>
<td>Entering AOP-015 for 702-AZ Room 105. Access is restricted to 702-AZ Room 104, 105, and 106. Shift Office Event Notification (SOEN) and radio announcement are completed.</td>
</tr>
<tr>
<td>1323</td>
<td></td>
<td>Exterior doors to 702-AZ Room 104 and 106 have been posted restricted access. IHTs are dispatched to perform monitoring and sampling.</td>
</tr>
<tr>
<td>1330</td>
<td></td>
<td>CSM notifies DOE-ORP Facility Representative,</td>
</tr>
<tr>
<td>1331</td>
<td></td>
<td>AY/AZ Maintenance Manager collects the Odor Response Cards from the Instrument Techs.</td>
</tr>
<tr>
<td>1345</td>
<td></td>
<td>Industrial Hygiene Technicians begin a sweep of 702-AZ. They perform DRI monitoring for Ammonia and VOCs. They pull grab air sample from Room 105. Grab sample is run through Lumex, Miran SaphiRe, and HAPSITE.</td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
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</thead>
<tbody>
<tr>
<td>1345</td>
<td></td>
<td>Additional information is reported to the Shift Office: No systems had been breached when the 3 Instrument Techs went to perform calibrations. Had work been allowed to progress, the system would have been breached and IHTs would have been present.</td>
</tr>
<tr>
<td>1350</td>
<td></td>
<td>IHTs complete sweep. DRI readings in 702-AZ were non-detect for Ammonia and VOCs.</td>
</tr>
<tr>
<td>1409</td>
<td></td>
<td>Standing Odor OPS-16-008 is cancelled based on implementation of TFC-OPS-OPER-C-67, “Response to Readily Apparent or General Purpose Facility Odors”.</td>
</tr>
<tr>
<td>1416</td>
<td></td>
<td>Shift IHT reports non-detectable for COPCs on Lumex and Miran SapphiRe.</td>
</tr>
<tr>
<td>1423</td>
<td></td>
<td>AY/AZ First Line Manager contacts CSM to inform that a sample port valve in Room 105 of 702-AZ may have been left open.</td>
</tr>
<tr>
<td>1439</td>
<td></td>
<td>Event Investigation EIR-2017-002 is initiated by under the instruction of</td>
</tr>
<tr>
<td>1442</td>
<td></td>
<td>IH Manager contacts CSO to inform that IHTs report that sample port valve is in the closed position.</td>
</tr>
<tr>
<td>1449</td>
<td></td>
<td>SOEN goes out on entry into an event investigation.</td>
</tr>
<tr>
<td>1457</td>
<td></td>
<td>CSM notifies DOE-ORP Facility Representative, on cancellation of the OPS-16-008 standing order and on an initiation of the event investigation.</td>
</tr>
<tr>
<td>1650</td>
<td></td>
<td>IH Manager, reports to CSM that sample analysis results for 702-AZ AOP-015 Grab Air Sample show at or below background level readings.</td>
</tr>
<tr>
<td>1650</td>
<td></td>
<td>AOP-015 for 702-AZ is exited.</td>
</tr>
</tbody>
</table>
### Immediate Actions Taken

1/26/2017

- Instrument Technicians who identify the odors look quickly for a source
- Instrument Technicians cannot identify a source and perform SWIM
- Instrument Technicians relocate to 271-AZ and contact the AY/AZ Area Day Shift Manager
- Industrial Hygiene Investigation is performed and grab air samples are taken
- Grab air samples reveal no chemicals of concern and 702-AZ is returned to service.

### Compensatory Measures

1. 1/26/2017, 1317 hours, entered into TF-AOP-015.
2. 1/26/2017, 1317 hours, access is restricted to 702-AZ Room 104, 105, and 106. SOEN is distributed and radio announcement is made.
3. 1/26/2017, 1650 hours, IH Manager reports that sample analysis show below background level readings.
4. 1/26/2017, 1650 hours, CSM exits out of TF-AOP-015 and SOEN notification is made.
5. 1/26/2017, 1836 hours, 702-AZ is returned to service.

### Preliminary Extent of Condition Review

An Extent of Condition was performed to investigate if there was a potential for similar events. A search of the PER database revealed two odor events that occurred at 702-AZ that may be similar to a degree and may be an indication of a potential for future similar events. However, the technical data is insufficient to draw a conclusion.

On 4 May 2016, ammonia-like odors were reported during filter paper changes at the 702-AZ Sample CAM cabinet. At the time that the odors were encountered, IHTs were performing direct reading instrument (DRI) monitoring and detected no elevated readings. Bag samples were later taken within the 702-AZ CAM cabinet and results were well below action limits (WRPS-PER-2016-0908).

On 6 June 2016, upon entering 702-AZ A Train Filter room to perform temperature calibrations, an instrument technician reported a “rotten egg” odor. Air samples gathered by IHTs were analyzed and determined to be below action level (WRPS-PER-2016-1229).
Discussion of Potential Causes

At the time of this investigation, the cause is indeterminate. Affected personnel as well as others in the area believed that the “burnt rubber or wire” odor was coming from the Building’s Air Handling Unit (HVAC). The unit is located on the roof just above Room 105. There was also speculation that the equalizing cone in the cabinet could have been connected to the ammonia odor.

Discussion of Barriers That Could Have Impacted the Cause

See Discussion of Potential Causes above.

Recommendations/Proposed Corrective Actions

Consider briefing staff on taking precautionary measures when opening the 702-AZ Sample CAM cabinet.

Attachments:

1. Industrial Hygiene Investigative Report includes Odor Response Card
2. Shift Log for January 26, 2017
3. Team AZ Release Sheet for January 26, 2017
4. Sample/CAM Calibrations Procedure
5. WRPS-PER-2017-0202
Attachment 1 – Industrial Hygiene Investigative Report
1. Field response actions:
   Event Summary (including number of workers involved and activity in progress):

   3 WRPS Instrument Techs reported “ammonia/burnt rubber or wire/musty/smoky/hot electrical” odor in room 105 of 702AZ building after returning to work in the afternoon to perform CAM calibration activities in the CAM cabinet. No odor detected during work in the morning. No symptoms were reported and all personnel declined precautionary medical evaluations.

   - Was an IHT Present during initiating event? [ ] Yes [X] No
   - IH Monitoring/ Sample Survey Reports:
     - 17-00347 AOP-015 702AZ 104,105,106

Weather Conditions at Time of Event: N/A: within enclosed buildings

   - Temperature (F):
   - Barometric Pressure (steady/rising/falling):
   - Humidity:
   - Wind Direction & Speed:
   - Weather station:

   Field Response Timeline:

   1316 SOM arrives in MO-267 to solicit support in AOP-15 response from COMS IH.
   1316 COMS IH and SOM arrive at CSO.
   1317 COMS IH contacts EV IH for additional support.
   1318 COMS IH contacts PO IH lead to request PO Shift IHTs to report to CSO.
   1318 All-call radio announcement goes out to restrict access to 702AZ bldg. and entering AOP-15.
   1318 SOEN: “Entering AOP-015 for 702AZ building. Access is restricted to 702AZ rooms 104, 105, and 106. CSM”
   1319 EV IH reports to CSO.
   1321 PO IHT lead arrives at CSO.
   1321 COMS IH and EV IH receives brief by CSM.
   1322 CSO receives phone call from operator in 702AZ control room to notify CSM that CAM is in bypass mode.
   1323 PO Shift IHTs arrive at CSO.
   1323 EV IH and COMS IH brief IHT shifters on response plan: Respiratory protection required. IHTs are to enter 702AZ bldg. and perform DRI monitoring for Ammonia and VOCs. Pull grab air sample from room 105. Run grab air sample through Lumex, Miran SaphirRe, and HAPSITE
   1324 PO IHT supervisor arrives at CSO
   1325 PO shift IHTs leave CSO to gather supplies and perform response actions
   1327 COMS IH asks PO IHT supervisor to contact IHTs assigned to the work crew
   1329 PO IHT supervisor updates COMS IH: IHTs were not present at the work location
   1333 COMS IH requests PO IHT manager to re-contact IHTs assigned to the job to see if they were required for morning work evolution.
   1334 PO IHT supervisor updates COMS IH. IHTs were not required for morning work evolution.
   1345 PO shift IHTs begin sweep of 702AZ.
   1347 AN IH arrives at CSO.
   1350 PO shift IHTs contact Shift IH and DRI sweep has been completed. IHTs en route to perform DRI sampling on grab air sample. DRI readings in 702AZ were non-detect for Ammonia and VOCs.
1350 Work crew delivers Odor Response Cards to CSO and briefs SOM.
1353 COMS IH requests PO IH Manager to verify HAPSITE would be ready to receive grab air sample.
1354 AN team IH contacts programs IHT to verify HAPSITE is in ready status
1408 WRPS General Delivery issued a statement from Communications and Public Relations on “Odors reported 1/26/17” to All WRPS employees.
1409 Performance assurance manager contacts CSM and questions CSM whether or not we met criteria for entering AOP-15.
1416 Shift IHT calls COMS IH to report non-detectable for COPCs on Lumex and Miran SapphiRe. Post on all DRTs were in tolerance. IHTs en route to 2704HV to deliver grab air sample for HAPSITE analysis.
1421 PO shift IHTs deliver grab air sample to 2704HV for analysis on HAPSITE.
1423 AY/AZ first line manager contacts CSM to inform CSO that a sample port valve in room 105 of 702AZ may have been left in open configuration during work performed on 01/25/2017.
1426 AN team IH leaves CSO to coordinate with PO IHT lead to send IHTs and NCO to verify valve position.
1428 CSO contacts AY/AZ team manager and AY/AZ first line manager to elicit more information as to why they think valve may have been left in an open configuration on 01/25/2017.
1430 CSO discussion involving CSM/PO IH manager/SOM regarding theory of possible open sample valve. Additional information regarding valve status revealed that personnel were concerned with the IHT sample port used for exhaust stack sampling/monitoring which had been accessed at the conclusion of retrieval activities but no visual evidence had been observed.
1432 PO IH Manager contacts AN team IH and PO IHT lead that 702AZ valve configuration verification is not need at this time.
1438 EIR investigator arrives at CSO.
1441 AN team IH contacts IH programs TF-AOP-015 SME.
1442 PO IH Manager contacts CSM to inform CSM that PO shift IHTs were confident that the sample port valve was left in the closed position.
1445 PO IH Manager contacts IH Programs Manager to elicit support in finding a Programs Chemist to analyze HAPSITE data.
1447 AN Team IH attempts to contact Primary Programs Chemist/Secondary Programs Chemist and Tertiary Programs Chemist.
1451 AN team IH contacts Tertiary Programs Chemist who is unavailable to perform data analysis on HAPSITE but will take the action to contact either the Primary or Secondary Programs Chemist.
1455 COMS IH contacts IH Programs TF-AOP-015 SME to provide update.
1701 SCEN: Sample analysis for the TF-AOP-015 event has been completed and the results are at or below background levels. Exiting TF-AOP-015. CSM
1708 WRPS General Delivery issued a statement from Communications and Public Relations on “Update: Odors reported 1/26/17” to All WRPS employees.
2. GCMS Sample Results:

No chemicals other than those outgassing from the bag material were observed.
3. Additional Information:

- Odor Response Cards received:

   Odor Response Card

   1. Contact CSM [Redacted] complete below bulleted information and map.
      - Date and time odor was noticed: [Redacted]
      - Your name and the work you were performing: [Redacted] maintenance
      - Location of odors (mark area on map and wind direction): [Redacted] N.E.
      - Name of others in or near the affected area: [Redacted]
      - Was an IHT present? [Redacted] No
      - Describe the odor: [Redacted] [Other: [Redacted] metallic]
      - Possible source: [Redacted] over heated equipment. [Redacted]
      - Your symptoms (if any): [Redacted] fatigue

   2. Send this card to the Central Shift Office.

   Revised 2/9/15
Odor Response Card

Odors Detected with NO Immediate Symptoms

1. Notify Immediate Supervisor.
2. Contact Central Shift Manager, provide below information.
3. Complete map, return to Central Shift Office as soon as possible.

Odors Detected WITH Symptoms

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

1. Contact CSM, complete below bulleted information and map.

- Date and time odor was noticed: 1-30-17, 1:00 PM
- Your name and the work you were performing:
- Location of odors (mark area on map and wind direction): Inside containment at 702 AZ
- Name of others in or near the affected area:
- Was an IHT present?: No
- Describe the odor: Sweet, Sour, Musty, Earthy, Metallic, Smoky, Rotten, Onion, Cleaning Solution, Ammonia, Other
- Possible source: 702 AZ, Stack
- Other:

2. Send this card to the Central Shift Office.

Revised 2/9/15
Odor Response Card

Odors Detected with **NO** Immediate symptoms

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

Odors Detected **WITH** Symptoms

4. Notify Immediate Supervisor.
5. Contact CSMA, __________ 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 wind direction)
   - Describe the odor
   - Name of others in or near the affected area
   - Was an IMT present?
   - Possible source
6. Provide information on the back of card.
7. Send this card immediately to the Central Shift Office.

Wind Direction

NO WIND INSIDE BUILDING
Odor Response Card

1. Contact CSM, [redacted] complete below bulleted information and map.
   - Date and time odor was noticed: 1-27-17, 1-26-17
   - Your name and the work you were performing: [redacted]
   - Location of odors (mark area on map and wind direction): 702 INST BUILDING
   - Name of others in or near the affected area: [redacted]
   - Was an IHT present? No
   - Describe the odor: [redacted]
     - Possible source: [redacted]
     - Your symptoms (If any): [redacted]

2. Send this card to the Central Shift Office.
• Summary of IH Monitoring and Sampling Data:


b. Sampling: Bag samples were analyzed by GC/MS. Nothing above background levels were determined. No action levels were exceeded.

4. Summary of Employee Reported Information (e.g., symptoms):

Three workers opened an electrical cabinet and smelled a strong odor. The odor was musky, ammonia, burnt rubber/wire, hot electrical as described by the workers.

5. Recommendations/Conclusions:

Identification of Source of the Concern: [ ] Yes [X] No
Other:
The odors described by the workers appeared similar to what one might smell in an electrical cabinet. The possible exception was the ammonia odor. It should be noted that the previous day ten workers smelled an ammonia like odor in the same general area.

Glossary:

COPC: Chemical of Potential Concern  
CSM: Central Shift Manager  
CSO: Central Shift Office (274AW)  
DRI: Direct Reading Instrumentation  
IH: Industrial Hygienist  
IHT: Industrial Hygiene Technician  
PO: Production Operations  
SCBA: Self Contained Breathing Apparatus  
SME: Subject Matter Expert  
SOEN: Shift Operation Emergency Notification  
SOM: Shift Operations Manager  
VOC: Volatile Organic Compound
Attachment 2 – Shift Log for January 26, 2017
Attachment 3 – Team AZ Release Sheet for January 26, 2017
<table>
<thead>
<tr>
<th>Line</th>
<th>Facility</th>
<th>EAM</th>
<th>Activity</th>
<th>Supervisor</th>
<th>POD Comments</th>
<th>Release Authority Comments</th>
<th>Tag Out RPR</th>
<th>Per Prob</th>
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<tbody>
<tr>
<td>1</td>
<td>AY</td>
<td>201026</td>
<td>AY102 Annulus Waste Accumulation Video Inspections</td>
<td></td>
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<tr>
<td>2</td>
<td>702 AZ</td>
<td>202008</td>
<td>702-AZ FLOW SWITCH (AZK111-2) CALIBRATION</td>
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<td>3</td>
<td>702 AZ</td>
<td>202009</td>
<td>702-AZ PRESSURE SWITCH (AZK111-1) CALIBRATION</td>
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<td>702 AZ</td>
<td>202177</td>
<td>702-AZ Stack PIT-AZK1 Cal</td>
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<tr>
<td>5</td>
<td>AY</td>
<td>171874</td>
<td>241-AY, Repair Farm Lighting</td>
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<td>AY/AZ</td>
<td>276533</td>
<td>241-AY/AZ MONTHLY ANNULUS EXHAUST FAN INSPECT (Jan)</td>
<td>AY-102 OE</td>
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<td>7</td>
<td>AZ</td>
<td>276894</td>
<td>702AZ VTP A-Train Monthly Fan Inspect (Jan 2017)</td>
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<td>9</td>
<td>AY</td>
<td>TO-270-925</td>
<td>AY-102 Retrieval Operations (A,B,C,D Shifts)</td>
<td>AY-102 OE</td>
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<td>AY</td>
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<td>AY-102 Annulus Pumping Into AY-102 Primary</td>
<td>AY-102 OE</td>
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<td>AY</td>
<td>TO-200-410</td>
<td>Operate POR394 Raw Water Distribution Skid</td>
<td>AY-102 OE</td>
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<td>12</td>
<td>AX</td>
<td>WO 173185</td>
<td>241-AX Level 3 Construction Mechanical (Skill of Craft)</td>
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<td>150-ton</td>
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<td>13</td>
<td>AX</td>
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<td>AX Farm Level 3 Electrical</td>
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<td>2 Racks, 8 Bottles</td>
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<td>AX</td>
<td>WO 183623</td>
<td>AX-104 Clean 04B Pit for Retrieval</td>
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<td>SSW RedCon Overlata</td>
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<td>15</td>
<td>AX</td>
<td>TFC-14-2767</td>
<td>AX-101, 102, 103, 104 Pits Foam Removal</td>
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<td></td>
<td>All workers need Be qual'd</td>
<td></td>
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<td>16</td>
<td>AX</td>
<td>WO 167240</td>
<td>241-AX Install Gate Access to 241-A Farm</td>
<td></td>
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<td>AZ- 16-00s</td>
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<tr>
<td>Line</td>
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<td>Activity</td>
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Attachment 4 – 702-AZ CAM Sample Cabinet Procedure
1 SCOPE

1.1 Perform calibration of the isokinetic flow through 702AZ record sample and CAM system using procedures: 6-TCD-494 Calibration Testing and Re-Calibration Sequence for Moore Industries TRX Temperature Transmitters, 6-PCD-508 Calibrate Pressure or Vacuum Switches, 6-VT-257 Linear Integrating Totalizer Calibration Moore Industries Model Lit, 6-VT-452 Calibrate 4 - 20 Milliamp Action Instruments Signal Isolators or Air Monitor Corporation VI Converter, 6-FCD-385 Calibrate MASS-Tron II Flow Indicator and the attached data sheets.

2 SPECIAL TOOLS AND EQUIPMENT

2.1 Comply with special tools, equipment, and supplies detailed in referenced procedures.

2.2 CAM bypass keys

3 PRECAUTIONS AND LIMITATIONS

3.1 Comply with precautions and limitations in referenced procedures.

3.2 Take out of service only those instruments which can be removed, calibrated, and installed in one shift.

3.3 If valves MK-AZ101K1-2, MK-AZ102K1-2, MK-AY101K1-2, and/or MK-AY102K1-2 are repositioned, SR 3.1.1 of LCO 3.1 applies and flow ≥ 40 ft³/minute from each tank needs to be verified immediately.

4 PREREQUISITES

4.1 This work package will utilize radiological limits and controls specified in RWP TF-100;

4.2 Prior to beginning work, review with the 702-AZ Shift Manager all activities to be performed.

4.3 Prior to and during this evolution, Operators should verify that no intrusive work on primary (opening risers or cover blocks) will be allowed.
4.4 Prior to the end of each shift, FWS shall COMMUNICATE current plant configurations to Shift Manager.

4.4.1 If plant configurations require adjustment, Shift Manager shall provide direction.

5 SPECIFIC WORK INSTRUCTION

NOTE – Work steps 5.1 – 5.2 can be performed AND/OR repeated as necessary throughout the duration of this work instruction.

5.1 If, during calibration any instrument fails, NOTIFY FWS to request direction from Engineering.

5.1.1 DOCUMENT Engineering disposition on Work Record.

5.2 If a vacuum pump fails during this evolution, NOTIFY FWS to request direction from Shift Manager.

5.3 POSITION switches as follows:

- X 5.3.1 CAM Interlock Bypass Switch HS-AZK1-3 in BYPASS for the operating fan (AZ-K1-5-1A or AZ-K1-5-1B).

- X 5.3.2 Recirc Module Switch HS-AY101/AY102-K451-1 in DISABLED

- X 5.3.3 Recirc Module Switch HS-AZ101/AZ102-K451-1 in DISABLED

- X 5.3.4 DEPRESS HS-AZK1-1A1 and HS-AZK1-1B1 to pre-silence alarms.

- ▼ 5.3.5 MOVE HS-AZK111-1D and HS-AZK111-1E to OFF position.

5.4 ENSURE 702-AZ is configured properly for instrument calibration.

- ✓ 5.4.1 ENSURE K1-2 valves are in "MANUAL" mode. (MK-AZ101K1-2, MK-AZ102K1, MK-AY101K1-2, and MK-AY102K1-2).

- ✓ 5.4.2 ENSURE Fan AZ-K1-5-1A setpoint is in "MANUAL".

- ✓ 5.4.3 ENSURE Fan AZ-K1-5-1B setpoint is in "MANUAL".
5.4.4 FORCE Bit for "FIT" interlock.

5.4.4.1 Instrument Technician LOGIN.

5.4.4.2 CLICK on Fl-AZK1-3.

5.4.4.3 ENABLE force

5.4.5 Operations PERFORM monitoring of system parameters during calibrations.

NOTE 1- K1-2 valves (MK-AZ101K1-2, MK-AZ102K1-2, MK-AY101K1-2, and MK-AY102K1-2) shall not be repositioned or fan speed adjusted during the calibration process unless absolutely necessary, as determined by Shift Manager.

NOTE 2- BETA CAM will show air flow values locally and will continue to operate in local mode. Operation and interlocks will be disabled during calibrations.

NOTE 3- Tasks 1, 2 and 3 may be performed in parallel.

TASK 1: CAM Flow Calibrations (TT-AZK1-1, FQI-AZK1-1, RY-AZK1-1, FY-AZK1-1 and FIT-AZK1-1)

5.5 CLOSE HV-AZK1-1A5 and HV-AZK1-1A6.

NOTE: Section 5.6 through 5.10 may be performed in parallel or out of sequence.

5.6 CALIBRATE TT-AZK1-1 per 6-TCD-494 and ET-07671.

5.7 CALIBRATE FY-AZK1-1 per 6-VT-452 and ET-07004.

5.8 CALIBRATE FQI-AZK1-1 per 6-VT-256 and ET-06969.

5.9 CALIBRATE RY-AZK1 per 6-VT-452 and ET-07003.

5.10 CALIBRATE FIT-AZK1-1 per 6-FCD-385 and ET-06290.

5.11 OPEN HV-AZK1-1A5 and HV-AZK1-1A6.

TASK 2: Record Sampler Flow Calibrations (TT-AZK1-2, FY-AZK1-2, FQI-AZK1-2, and FIT-AZK1-2)

NOTE: Section 5.13 through 5.16 may be performed in parallel or out of sequence.

5.13 CALIBRATE TT-AZK1-2 per 6-TCD-494 and ET-07670.

5.14 CALIBRATE FQI-AZK1-2 per 6-VT-257 and ET-06970.

5.15 CALIBRATE FY-AZK1-2 per 6-VT-452 and ET-07067.

5.16 CALIBRATE FIT-AZK1-2 per 6-FCD-385 and ET-06289.


TASK 3: Stack Flow Calibrations (TT-AZK1-3, FY-AZK1-3, TY-AZK1-3, FQI-AZK1-3, and FIT-AZK1-3)

NOTE: Work step 5.18 can be performed AND/OR repeated as necessary.

5.18 If active heater shuts down, Operations RESTART heater per T0-060-350 Start, Stop and Operate AY/AZ Tank Ventilation Primary Exhaust System.

5.19 CLOSE HV-AZK1-3A5 and HV-AZK1-3A6.

NOTE: Section 5.20 through 5.24 may be performed in parallel or out of sequence.

5.20 CALIBRATE TT-AZK1-3, per 6-TCD-494 and ET-07672.

5.21 CALIBRATE FQIAZK1-3 per 6-VT-257 and ET-06968.

5.22 CALIBRATE FY-AZK1-3 per 6-VT-452 and ET-07005.

5.23 CALIBRATE TY-AZK1-3 per 6-VT-452 and ET-07002.

5.24 CALIBRATE FIT-AZK1-3 per 6-FCD-385 and ET-06286.

5.25 OPEN HV-AZK1-3A5 and HV-AZK1-3A6.

TASK 4: Vacuum Pumps (PS-AZK111-1 and PS-AZK111-2)

5.26 CALIBRATE offline vacuum pump [PS-AZK111-1 (ET-07080) or PS-AZK111-2 (ET-07039)] per 6-PCD-508.

5.27 RESTORE power to Sample System control valves if required.

5.27.1 PLACE HS-AZK111-1D and HS-AZK111-1E to ON.
5.28 SWAP pumps.

5.29 Complete CALIBRATION of second vacuum pump per 6-PCD-508.

5.30 CONFIGURE vacuum pumps for normal operation per Shift Manager.

6 TESTING AND RESTORATION

6.1 Post Maintenance testing performed in Step 5.

6.2 VERIFY that an alarms generated by this evolution are cleared.

6.3 RESTORE fan configuration:

6.3.1 ENSURE the ventilation system is in a stable, static condition prior to commending work.

6.3.2 RETURN the system to normal operating conditions per Shift Manager direction.

6.3.2.1 ENSURE Fan AZ-K1-5-1A setpoint is in "AUTO".

6.3.2.2 ENSURE Fan AZ-K1-5-1 B setpoint is in "AUTO".

6.3.2.3 ENSURE K1-2 valves are returned to the mode prior to calibration or as directed by the FWS/Shift Manager. (MK-AZ101K1-2, MK-AZ102K1-2, MK-AY101K1-2, MK-AY102K1-2).

6.4 REMOVE Force Bit for "FIT" interlock.

6.4.1 Instrument Tech Log IN (as needed)

6.4.2 CLICK on FI-AZK1-3.

6.4.3 REMOVE force on Bit for interlock.

6.4.4 LOG OFF as Technician at HMI
6.5 POSITION the following switches:

- CAM Interlock Bypass Switch HS-AZK1-3 in enable
- DEPRESS HS-AZK1-1A1 and HS-AZK1-1B1 to normal position (Button is in the out position)
- MOVE HS-AZK111-1D and HS-AZK111-1E to ON position (If not already in on position).
- Recirc Module Switch HS-AY101/AY102-K451-1 in enable
- Recirc Module Switch HS-AZ101/AZ102-K451-1 in enable

6.6 RESET alarms using HS-AZK1-1A1 and HS-AZK1-1B1.

6.7 ALLOW System to stabilize for a minimum of 10 minutes, then notify FWS of status.
Attachment 5 – WRPS-PER-2017-0202
# Problem Evaluation Request (PER)

**Problem Evaluation Request (PER)**  
WRPS-PER-2017-0202  
In Process/Work

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**Location**
Other Operations Facility

**How Was Problem Discovered**
Routine Work/Maintenance

**Description of Concern or Problem**
Three WRPS instrument Techs reported ammonia/burnt rubber/wire odor in room 105 of 702AZ building while performing CAM calibration in the CAM cabinet.

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**Does issue require immediate actions?**
No

**Immediate actions Taken or Planned**
Exited area and notified CSM, entered AOP-015.

**Recommended Corrective Actions**

**Trend**

**Originator Contact**
No

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**SHIFT OPERATIONS REVIEW**

**Reportability**
SSC Operability  
Operability Review  
Comp Measures Req

**Describe actions Taken or Recommended**

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**SCREENING**

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**PER Screening Comments**
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**ATTACHMENTS**

Link to PER

**AUDIT HISTORY**

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02/07/2017 09:44 AM