washington river protection solutions

CPPO Chemical Protection Program Office

SST Automation Project Manager performs a walkdown of TY Farm in Support of SST Automation Upgrades. For more, see KPP 6. *Photo courtesy Doug Larsen*

Tank Operations Contract
Chemical Protection Program Office Weekly Report
February 1, 2018

1. CHEMICAL PROTECTION PROGRAM OFFICE (CPPO) ACTIVITIES STATUS

In coordination with Industrial Hygiene and the Environmental, Safety, Health and Quality (ESHQ) Chemical Protection Integration Manager, the first three of the nine part presentation introducing the workforce to the new vapors-related Industrial Hygiene remedies were finalized. The remaining six presentations are in various stages of draft.

CPPO Oversight and Tracking

Hanford Vapors Website

The Hanford Vapors website logged over 3,100 views in January 2018; an increase of 26% from the previous month. In January, the website experienced an average of 101 hits per day. The average hits per day for the Fiscal year-to date is half of what was seen over the same period last year. The data for FY2017 is slightly skewed for this timeframe, however, due to the increased traffic as the website was newly unveiled. A rise in traffic continues to occur on the days that the Hanford Vapors Weekly Update is posted. Other notable pages accessed frequently this month include the Archives and Reference Materials pages, along with Enhancing Vapor Identification, and News & Updates.

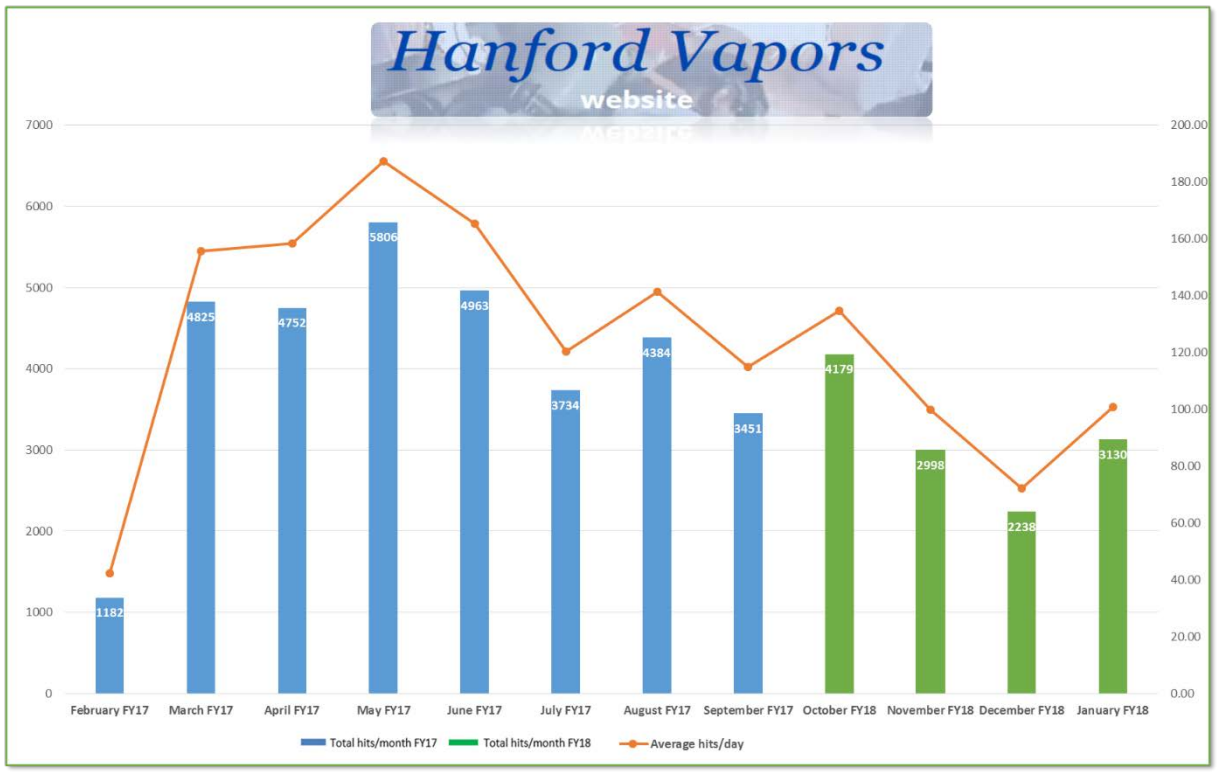

Figure 1. Hanford Vapors Website Statistics

2. COMPREHENSIVE VAPOR ACTION PLAN Key Performance Parameters

KPP 1. Engagement and Effective Measurement

Key Performance Parameter 1

Establish a comprehensive vapor management communication plan, engagement processes, and effectiveness measurements.

- Chemical Protection Engagement: Center for Toxicology and Environmental Health (CTEH)

  The CTEH team continued to work on the nine part CPPO Notebook presentation series for introducing to the workforce the new vapors-related Industrial Hygiene remedies. Additionally, the team is assisting with tabulating the current vapors information effectiveness survey results.

- Chemical Protection Engagement: Chemical Vapors Solutions Teams (CVST)

  The CVST Communication Sub-committee met on January 22, 2018.

- Chemical Protection Engagement: Communications

  Last week's CPPO Notebook is titled *242-A Evaporator Campaign-06, Industrial hygiene sampling and monitoring results.* This week's CPPO Notebook is titled *Industrial hygiene assessment: Introduction, KPP 3.*

  Solutions, Issue 422, published on January 22, 2018, reported, "…WRPS's AP Farm Exhauster Upgrade Project received the PMI Award for Project Excellence – one of only two awards for the North American region. Previously, the project was named the Project of the Year."

  Training bulletin TB-18-01, *The New Chemical Worker Training Program,* was issued to WRPS as required reading on January 15, 2018. The bulletin introduced *Chemical Worker Tier Trainings*. Determining that a "tiered approach to training is more effective because less time is spent in training that is not needed for your job requirements," WRPS created three tiers of training and its commensurate refresher course.

- Chemical Protection Engagement: Hanford Vapors Website Updates
  - Second Vapor Management Expert Panel Report
  - Second Vapor Management Expert Panel Report Summary
  - CPPO Weekly Report - Jan. 25, 2018
  - VMDS Weekly Report (April 26 - May 3, 2017)
  - Mobile Lab PTR-MS Monthly Report May 2017

Chemical Protection Engagement: Effectiveness Measures

The survey was distributed to 700 random WRPS participants. Completed surveys began returning Monday, January 22, 2018, and tabulations have begun.

Chemical Protection Engagement: Worker Feedback

Workers in Operations were very interested in the CPPO Notebook on the [1]NUCON® engineering-scale testing, and asked to share some Lessons Learned with the Chief Technology/NUCON team. A meeting was held between CPPO, the Chief Technology Office (CTO), and Operations during which, the technologies in the context of the worker's many years of experience in the tank farms was discussed. Historical lessons learned were examined and NUCON's depth of knowledge about the tank farms was increased.

3. KPPs 2 and 3. IH Technical Basis and IH Program

Key Performance Parameter 2

Maintain Industrial Hygiene Chemical Vapor Technical Basis and the chemicals of potential concern (COPC). Institutionalize a disciplined and rigorous process for updates to include new scientific findings and enhanced understandings of potential exposures.

IH Manual and Technical Basis

Last update 1/25/2018:

TFC-PLN-174, *Chemical Vapors Technical Basis Plan*, TFC-ESHQ-S_IH-C-67, *IH Chemical Vapor Technical Basis Maintenance*, TFC-ESHQ-S_IH-C-66, *COPC to COC Evaluation Process*, and other implementing documents are nearing completion. Briefing material is being developed to help facilitate the communication of the changes affecting the exposure assessment process and the management of chemical vapors in the tank farms.

Health Process Plan

Last update 1/12/2018:

The following HPP reports have been developed: *Proposed OELs for Chronic Exposures – COPCs with Regulatory Guidelines*, *Proposed Occupational Exposure Limits for Furans, Proposed Risk-Based Approach for Nitrosamine Chemical of Potential Concern, Proposed Acute Exposure Limits for COPCs with Regulatory Guidelines, Proposed OELs for Chronic Exposures – Nitrile Class COPCs and 2,4-Dimethylpyridine, Recommendations for Sampling and Analysis of Hanford Waste Tank Vapors, and Hanford Tank Vapors FY 2017 Chemicals of Potential Concern update.* The final study, currently in progress, is *Assessing the Potential for Chronic or Acute Health Effects from Exposure to COPC Mixtures*. This study will incorporate the chemical mixtures modeling, Acute Transient Exposure Concentration (TEC) Standard Operating Procedure (SOP) and Initial Screening, and potential approach to fill gaps in acute TECs and mixture effects.

Leading Indicators

Last update 1/12/2018

Key Performance Parameter 3

Maintain Industrial Hygiene Program and institutionalize vapor program requirements, best practices and program parity, and complete necessary training to support full implementation at the beginning of FY2018.

During the 1st Quarter, the leading indicators project team evaluated the concentration ratios between COPCs found in the data collected during the previous year's cartridge testing. Ammonia (NH3) is currently the focus of the study due to its prevalence within the tanks. Direct read instrumentation (DRI) Ammonia readings are being compared to ammonia analytical samples to see how each sample type corresponds to concentration and duration of sampling. There were approximately 50 samples from the AP Exhauster and 5 samples from the A-103 Tank with reported concentrations for NH3 and N-Nitrosodimethylamine (NDMA). The clustering of data points from the mobile lab at the AP Exhauster show that the concentrations of both NDMA and NH3 were relatively constant over the 7-day campaign, indicating that ammonia and NDMA may be viable as leading indicators.

Maintain Industrial Hygiene Program and Institutionalize Vapor Program Requirements

Update:

Training bulletin TB-18-01, *The New Chemical Worker Training Program,* was issued to WRPS as required reading on January 15, 2018. The bulletin introduced *Chemical Worker Tier Trainings*. Determining that a "tiered approach to training is more effective because less time is spent in training that is not needed for your job requirements," WRPS created three tiers of training and its commensurate refresher courses. *Tier 1: General Chemical Awareness Training*, targets all WRPS workers and is available as a standalone computer based training (CBT) for other Hanford Contractors. *Tier 1*, available since September 2017, covers general chemical and odor awareness. *Tier 2* was published this month. It targets all WRPS workers located past the Wye Barricade, is a CBT, and *Tier 1* is its prerequisite. *Tier 3* is pending.

Central Residence for Industrial Hygiene Technicians (IHT)

Update:

Retrieval Industrial Hygiene Technicians (IHT) and their first-line supervisors will be relocated to a centralized mobile office (MO) building. The MO is slated to house approximately 100 workers. According to retrieval field support, this new space will be large enough to house all retrieval IHTs and their first-line supervisors. Plans are to install the MO in 200 East area on 4th Street near 218A across from

PUREX. The installed and occupied MO will satisfy KPP 3 for retrieval IHTs. The trailer site is at 60% completion. The trailer design is under review for approval by Washington State Labor and Industries.

Air Dispersion Modeling

Last update 1/25/2018: The Dispersion Modeling project team is currently working on Air Pollutant Graphical Environmental Monitoring System (APGEMS) regression tests and test cases; the model updates are complete, but modifications continue as they perform tests and identify fixes or opportunities for improvements, mostly in the software and graphic user interface (GUI). They are also drafting a report to summarize the model, capabilities, limitations, and to provide a quick users guide.

KPP 4. Engineering Controls

A Farm Exhausters

Last update 1/18/2018:

The design team began modifying the vendor contract, further refining the concrete installation work scope. In order to confirm the scope of ducting isolation activities, the team began walkdowns.

Key Performance Parameter 4

Complete engineering control concept demonstrations for Strobic Air Tri-Stack® and NUCON® International, Inc. thermal combustion in support of unrestricted work boundaries

AW Stack Extension

Update:

The final (100%) design package continues its review. The *Plant Forces Work Review* was completed and is currently under review.

AN Stack Extension

Last update 1/18/2018:

Engineering evaluations to determine the optimum height required for the stack and whether the existing superstructure can support that stack height increase are planned.

[2]Strobic® Air Dilution Fan

Update:

For factory acceptance testing, the following was accomplished during the reporting period:

- WRPS continued to review submittals provided by Strobic, focusing on the schedule, welding, nondestructive examination procedures, and drawings submittals.
- Equipment procurement and receipt is on-going.
- In parallel with these activities, unit fabrication was started.

For the second phase of off-site testing, efforts to award the test plan contract continued. Four proposals were received and all were deemed technically viable. The next phase will be to award the contract.

NUCON® Thermal Oxidation Vapor Abatement Unit (VAU)

Update:

The engineering-scale testing continues to be developed, with the following accomplished during the reporting period:

- Terragraphics
  - Performed final inspection of the electrical rack and the rack was shipped to the test site on 1/18/18.
  - Continued developing the site alternatives for the technical demonstration. During the week of 1/15, performed an initial screening of the site alternatives, with the following four tanks selected for further evaluation: BY-108, TY-103, SX-104, and A-106. During the week of 1/22, performed field walkdowns of the four sites to determine the site layout of each tank.
  - Continued work on Functions and Requirements document revision.
- NUCON®
  - Continued working on the design and fabrication of the diesel conversion kit. All drawings were completed and submitted for the kit, and the generator was shipped.
- PNNL
  - Continued development of the analytical equipment as testing of the pre-concentrator was started along with approval to lease the FTIR unit.
  - Received electrical rack and started set-up activities.
- WRPS
  - Continued its efforts to identify and procure a photoionization detector (PID) for volatile organic carbon analysis on high temperature diesel exhaust continued. A market review was completed, which recommended using available AreaRAEs along with preconditioning the exhaust to cool, dilute, and remove condensable material prior to running through the PID.

- Received feedback from the workers in Operations on the recently released NUCON engineering-scale testing CPPO Notebook. A meeting was held between CPPO, the Chief Technology Office (CTO), and Operations to discuss the technologies in the context of the worker's many years of experience in the tank farms. Historical lessons learned were examined and NUCON's depth of knowledge about the tank farms was increased.

KPP 5. Administrative Controls and Monitoring

Permanent Installation of VMDS Equipment in A and AP Farms

Last update 1/25/2018:

Key Performance Parameter 5

Define unrestricted work boundaries and implement monitoring on active stack ventilation and unrestricted work boundaries in the A farms to provide defense-in-depth.

In FY2017, WRPS identified viable VMDS components for use in the tank farms. The turnover of AP Farm UV-FTIR to Operations has been initiated. Activities last week include the following:

- Efforts are on-going to determine the format for reporting data that is being used to support VMDS technology development.
- Work continued on the modification of the Autosampler. Activities included:
  - Analyzing sample through the GC-FID. The results of these analyses will help finalize the test gas standards.
  - Briefing WRPS IH personnel on the Autosampler activities, with their feedback being used to support acceptance testing and test planning.
  - Procurement of items needed to support development of the gas standards and Autosampler. In parallel with these activities, design drawings for the test bed manifold and Hanford E-Skid are being prepared.
- For the AP-Farm UV-FTIR turnover, numerous activities were on-going during the reporting period, including the following:
  - Development of the *Functions & Requirements* document.
  - Preparation of the ammonia set point calculation. Efforts are underway to determine if additional chemicals should be included as part of this calculation.
  - Identification of the test gases that will be used to support the turnover.
  - Approval of the Operational Readiness Checklist for action, with efforts currently on-going to compile evidence needed to declare readiness.

Stack and Boundary Monitors

Last update 1/25/2018:

A path forward has been determined to resolve the WRPS Quality Assurance (QA) issue with ³CEREX®. The plan is for members of the WRPS QA and Engineering departments to visit Cerex and witness both fabrication and factory acceptance testing of their equipment. With a resolution now in-place, the request-for-proposal is currently being prepared for procurement of the UV-DOAS units.

Establishing Safe Unrestricted Boundaries

Last update 1/25/2018:

Coordinated by ORP, a draft paper, tentatively titled *Comprehensive Vapor Action Plan KPP 5 - Defining the Unrestricted Work Boundary,* was developed clarifying how WRPS will define work boundaries in and around the tank farms. This document provides a basis for the implementation of the tank farm boundaries moving forward for the IH Program.

During FY2017, WRPS's subcontractor Kenexis Consulting Corporation completed three quantitative risk assessments (QRA) designed to assess the probability and likely consequences of an episodic, acute exposure. The QRAs are being evaluated by WRPS and ORP. The subcontractor used a computational fluid dynamics air model; they modeled three tank farm emission sources, including a passively ventilated farm, an actively ventilated farm, and an actively ventilated farm in which one of the five tanks experiences buoyant displacement gas release events (BDGRE). The three QRAs are *A Farm Passive Breather Filters*, *AP Farm Exhauster*, and *AW Farm Exhauster* (including a BDGRE event).

Public Address System

Update:

The electrical installation at both C Farm and AP Farm were completed. The design reviews for all west area farms and B Farm have been completed and are going through final approvals. All ground scanning activities were completed for both the West area farm and B Farm complex, and work was started on the crossing lists and excavation permits. During turn-over testing of the PA system, an issue surfaced around the potential for batteries dying out and not re-charging in the cabinets. The solution is to install solenoids in the reader boards for battery drain protection. This warrantied work, to which the vender has agreed, requires the construction contractor's resources in support of the repairs.

KPP 6. Tank Operations Stewardship

Pilot SST Stewardship Program

Key Performance Parameter 6

Institutionalize a tank operations stewardship program that minimizes required tank farm personnel entries; and establishes parameters for locating ancillary personnel and offices.

Last update 1/25/2018:

SST Remote Monitoring Equipment:

Efforts continued on the TY-Farm temperature and surface level design packages. Procurement of equipment needed to support temperature and surface level installation activities were also started. Contracts were also awarded to MSA in support of network development and installation activities.

FY LEAN 2015 Report:

A draft of the *SST Stewardship Execution Strategy Document* was submitted for internal review. Since this is a first-of-its-kind document, the purpose of the preliminary review was to solicit feedback and confirm that WRPS was satisfied with the direction of this document. The review was completed and comments are currently being incorporated.

KPP 7. Hierarchy of Controls

Cartridge Testing and SCBA Alternatives

Key Performance Parameter 7

Provide options to promote the hierarchy of controls for chemical vapor respiratory protection beyond current use self-contained breathing apparatus.

Update:

The rollout of full-face air purifying respirators (FFAPR) using [4]Scott 7422-SD1® or 7422-SC1® cartridges has been ongoing at SY Farm since December 12, 2017. The industrial hygiene assessments for AY/AZ, AW, AN, and AX Farms are complete and await only approval from Stoneturn Consultants (STC). STC gave a presentation on the results and recommendations for the cartridge testing process to WRPS workers on January 17, 2018. STC was very complementary of WRPS's industrial hygiene program. STC also held a question and answer forum after their presentation. Headspace sampling began in BY Farm in late January 2018. Once the headspace sampling event is complete, cartridge testing will be conducted at BY Farm too. This round of testing will include power air purifying respirators cartridges.

Mobile Laboratory

Update:

During the reporting period, a draft Statement of Work to continue the background study was written by WRPS and offered to R.J. Lee.

- [5]C_2Sense® Personal Vapor Monitor

  Update:

  An Integrated Project Team kick-off meeting was held on January 18, 2018, with weekly follow-on meetings planned to status C_2Sense® activities for the upcoming field test in the tank farms. During the week of January 20, C_2Sense® developed their schedule for supporting testing and presented it at the status meeting.

KPP 8. Medical Support

The scope of KPP-8 is to support RL medical program enhancements in conjunction with other Hanford Site organizations.

Key Performance Parameter 8

Support medical program enhancements in conjunction with responsible Hanford Site organizations and establish update to WRPS process/procedures.

[1]NUCON is a registered trademark of Nucon International, Inc., Columbus, Ohio.
[2]Strobic Air is a registered trademark of MPC Inc., Wilmington, Delaware.
[3]CEREX trademark by TECAN SP, INC. Baldwin Park, California.
[4]Scott is a registered trademark by 3M in Maplewood, Minnesota.
[5]C_2Sense is a registered trademark by C_2Sense, Inc., Cambridge, Massachusetts.