

Notes from April 12, 2012 DOE Fugitive Emissions Working Group Meeting

Updates (Josh Silverman, FEWG Chair)

The Chair welcomed everybody to the call. Since the last FEWG call (February 2012), the FEWG website has been launched: <http://www.hss.doe.gov/sesa/sustainability/fewg/>. This website is a central location for presentations and notes from previous FEWG meetings, news about the FEWG, and other relevant reports and assessments written by DOE or outside sources. The HSS team will try to keep the webpage updated and useful to FEWG members, other DOE personnel, and anybody looking for information on lessons learned and best practices for controlling and minimizing fluorinated GHG emissions, especially SF₆. Any feedback is welcomed and should be directed to Josh Silverman or Jeff Eagan (contact information at the end).

Also since the last call, the HSS team has reviewed the 2012 SSPs. The Chair presented highlights and emerging patterns from the SSPs and CEDR-reported data. In this round of reporting, several sites reported fugitive emissions for the first time. This suggests that sites are getting deeper into the practical business of developing and managing a GHG inventory, and are beginning to look at some of the smaller or less obvious sources of GHG emissions. In some cases, the new fugitive emissions reporting reflects an incident that led to greater awareness of SF₆ onsite, and the sites detailed plans to review sources and identify/repair leaks. Other sites identified sources of SF₆ in their SSPs, but have not yet added SF₆ to the inventory process. These sites are generally not FEWG members and may benefit from the lessons learned and best practices regarding inventory control and leak prevention programs coming out of the FEWG.

Another emerging pattern across the SSPs involves cleaning up and/or taking old electrical distribution systems out of service. This activity typically involves managing a range of materials that require special handling, including PCBs, oils, and of course SF₆. Both the FEWG and Accelerator Safety Working Group (ASWG) have recently had discussions about SF₆ reclamation, sharing, repurposing, and/or environmentally responsible disposal. This led the Chair to ask for FEWG member input on how to handle legacy SF₆ in the inventory process. Have any of the sites already worked through this process? The Chair would like to know how sites are managing legacy SF₆ inventory from the decommissioned equipment, both in the GHG inventory process and in identifying appropriate disposition options. Please provide any experience and/perspective on this issue with Josh Silverman and/or Jeff Eagan (contact information at the end). This issue may need to be addressed in future inventory guidance.

The SSPs show improvement in descriptions of what “steady state” fluorinated GHG emissions will look like at the individual sites. The Chair pointed out that estimating steady state emissions is a planning concept to help site management, Program Office management, and DOE headquarters make realistic goals and plans based on a predictive estimate of fluorinated GHG emissions. Nobody expects the predicted steady state to function as an operation model; it is understood that operational events will impact the actual annual GHG emissions inventory.

The FEWG has focused on determining “steady state” SF₆ emissions levels, and good examples of conveying steady state in the SSP are: PPPL indicated that they are taking equipment offline for a couple years, which will leave SF₆ emissions at or near 0 for a few years, but they will jump when the equipment is back in service; other facilities indicate that current emissions are the steady state since all planned leak detection/repair activities have been completed and/or all planned capture equipment and processes are in place. A third group of facilities indicate that they are unable to quantify the impact of recent or near future planned activities.

In summarizing the SSP analysis, the Chair congratulated all of the sites for their efforts at SF₆ reduction as well as the quality of the SSP information. It is apparent that SF₆ reductions achieved since the 2008 baseline inventory are real and will continue. Additional decreases as a result of activities undertaken last year and this year should be apparent in FY12 reporting. There is some potential for further reductions; the Chair urged FEWG members to continue refining steady state projections and to increase discussions of non-SF₆ fluorinated GHG emissions and steady state in the SSP. It was also apparent from the 2012 SSPs and FY11 CEDR reporting that accidental releases can have significant impacts on the total emissions inventory.

2012 DOE SSPP: The Updated Process (Glenn Sonntag, Sustainability Performance Office)

CEQ released updated guidance for developing the SSPPs a couple weeks ago. The new format has much less narrative and all information will be entered into an OMB-controlled online system. The system is pre-populated with information from the last years’ SSPPs and the SPO will enter information from sites’ SSPs and CEDR data. The SPO may contact program offices and sites to verify the data/information and to fill in a few blanks. The program offices will be briefed on this process in the next week or so.

The only narrative associated with the new format is the executive summary, so the SPO is considering separately developing additional sectional summary documents, which will still be rolled up at a high level. Also, the GHG goal section has been restructured so that instead of having separate reduction goals for Scope 1&2 and Scope 3, there will only be one GHG reduction goal.

Question: How will DOE handle the internally-developed goals for fugitive emissions reduction?

Answer: There is a place in the OMB form to add planning strategies and information about the tracking process; the SPO will probably talk with appropriate folks about the specific strategies and information later.

Question: What is the timeframe for completing the 2012 SSPP?

Answer: The final is due to CEQ by June 29th. SPO’s goal is to finalize a version by mid-May in order to move it through the DOE approval process before the CEQ deadline. An exact timeline will be discussed with the program offices in the next week or so.

Oak Ridge National Laboratory SF₆ Emission Release (Alan Tatum, Holifield Radioactive Ion Beam Facility, ORNL)

Alan Tatum presented an update on two unrelated and unexpected releases of SF₆ involving the Tandem Electrostatic Accelerator at the Holifield Radioactive Ion Beam Facility in 2011. The first event happened on April 25, 2011, and involved the release of approximately 4,000 lbs of SF₆ during a routine transfer of SF₆ from the accelerator to the storage tanks prior to accelerator maintenance. During the transfer, a rupture disk burst and blew off a 3/8-inch stainless steel tube from a pressure switch. This switch is intended to provide operators with an indication of a loss of SF₆, but its failure allowed gas to escape through the 3/8-inch line for several minutes before being detected. An investigation into the event determined that the rupture disk was fatigued, and that the tubing connection in the pressure switch had been installed incorrectly. The rupture disk was replaced and the tubing repaired.

The second event, about a month later, involved the release of approximately 3,000 lbs of SF₆ during routine operations. The Tandem Accelerator design includes a central service platform that allows personnel to access the inside of the accelerator for maintenance activities. In May 2011, operators discovered a leaking ball valve in a hatch at the central service platform. The ball valves are connected to the hatch release as a safety check to ensure that there is no pressure on the other side before the hatch is opened. The leak was due to the failure of a ball valve seal, which was immediately plugged after being detected. All other ball valves were checked and employees subsequently performed independent leak checks of the whole system.

After the second event, HRIBF instituted an administrative and technical review of the whole gas-handling system. The lab reviewed procedures, age of components, functionality, and general performance of the system, and assessed opportunities to simplify system operations. Technicians reviewed all connections in the system looking for single point failure areas, and modified the ball valve design to keep the valve closed without losing the safety feature. To simplify the system, one of the older gas driers was taken out of service. Additional routine leak checks using a TIF detector were also added.

Worker safety due to oxygen depletion was not an issue during either event, and reporting was not required per rules in place at the time. The revised Occurrence Reporting and Processing System order would require reporting for this size SF₆ leak. The leaks were reported internally to ORNL management and were mentioned/included in the SSP and CEDR data submissions.

Question: Are you going to make your findings and lessons learned available to the community?

Answer: I haven't thought about it. The ASWG workshop may be a good forum for sharing this information.

Question: What was the design life of the accelerator?

Answer: It's not clear that a specific number was ever discussed; the accelerator has been in service for 30 years, but it has been working well and doesn't seem to have exceeded a

life expectancy as a whole. Certain components have needed to be replaced over time, and after 30 years it was certainly time to perform a comprehensive assessment of the system from a modern perspective.

ORPS Reporting Procedures (Ashley Ruocco, Skip Searfoss, DOE Office of Analysis (HS-24))

The ORPS order was revised last year, and DOE Order 232.2 went into effect January 2012. The revision was completed in order to streamline the process and to facilitate using ORPS for planning purposes. The body of the order was significantly reduced and there are six new attachments:

- Attachment 1: Contractor Requirements Document
- Attachment 2: Occurrence Reporting Criteria
- Attachment 3: Occurrence Report Preparation
- Attachment 4: Occurrence Reporting Model
- Attachment 5: Causal Analysis Tree
- Attachment 6: Definitions

Through the reporting system, DOE and NNSA are informed about incidents that could impact worker and public safety; complex-wide notification and analysis are conducted from the database. Causal analysis is included in the reporting, and new reporting criteria were added for SF₆. Under Group 5, Number 4, any discrete (start and stop within 7 days) release of SF₆ greater than or equal to 115 pounds or release of 115 pounds of SF₆ above normal emissions triggers ORPS reporting, but not causal analysis. Note that proactive reporting of events that don't meet specific reporting criteria is encouraged. Group 10 Management Concerns reporting can be used to report any activity of concern. This section is reviewed for continuous learning events across the complex.

At DOE headquarters, HS-24 reviews the ORPS daily and files them based on assigned keywords. Final ORPS reports and an analysis tool are available to the public. Reports from 2005 are available online. ORPS or operating experience questions can be addressed to Ashley Ruocco (contact information at the end).

Question: As indicated, SF₆ releases were not reportable last year. Why did SF₆ get added to ORPS and was there a technical basis for the 115 pound reporting threshold?

Answer: The SF₆ reporting category was added for the same reason that the FEWG was formed, in part to make SF₆ emissions more visible. The 115 pound threshold was selected because that is the most common size of a cylinder of SF₆. If an activity results in changing out cylinders ahead of schedule, it probably requires reporting under ORPS. Also, 115 pounds is approximately halfway to the threshold that would trigger reporting under EPA's Mandatory Reporting Rule. The SF₆ emissions component of the Mandatory Reporting Rule has not been promulgated, but EPA continues to indicate that it will be.

SF₆ Reuse Options: Fermi/other sites (Scott Davis, Accelerator Safety Program Manager, SC)

Scott Davis presented an update on ASWG activities. The ASWG continues to try to partner with sites, including facilitating a transfer of SF₆ from an EM facility to a SC facility. Currently, the ASWG functions primarily as a result of person to person relationships, but is hoping to move to a more system-based organization.

Scott explained that the ASWG is having difficulty capturing the cost savings associated with repurposing the SF₆. Their goal is to repurpose equipment and SF₆ in order to save money and still manage to do good science. Fermilab contacted Scott based on the last FEWG call looking for an outlet for their SF₆, preferably without having to pay for disposal. Scott and the ASWG were able to find an outlet for the SF₆ that won't cost Fermilab anything, and the lab might even get something back.

The ASWG is evaluating accelerator life spans and post-operations/D&D activities in an effort to determine how long the equipment should stay under the accelerator envelope, which would ensure careful take down and SF₆ repurposing.

Closing Remarks (Josh Silverman, FEWG Chair)

The Chair thanked all the participants and presenters. The next FEWG meeting is tentatively scheduled for Thursday, June 14th from 11am to noon EDT. Please provide any suggestions for topics and/or presentations to Josh Silverman or Jeff Eagan (contact information below).

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