

Notes from February 10, 2011 DOE Fugitive Emissions Working Group Meeting

DOE FEWG Updates: Josh Silverman (FEWG Chair):

1) DOE submitted the 2008 Baseline and 2010 GHG Inventories to OMB at the end of January. The Chair thanks everybody for helping with this process.

2) In November, HS-22 met with representatives of DoD to discuss strategies for controlling SF₆ emissions. The DoD representatives recently received permission to share with HS-22 a couple internal ("not for public release," but not otherwise classified) reports, one on Infrared detection technologies for SF₆, and the other a technical feasibility study of replacing SF₆ in specific DoD applications. HS-22 will review these reports, with the help of FEWG members, to determine if any components are relevant to the DOE sites. Any members with interest in participating in the review should contact Josh Silverman or Jeff Eagan.

3) The Chair thanked Sandia for hosting a recent HQ staff visit to discuss fugitive emissions. Sites interested in sharing information or hosting a visit to review fugitive emissions strategies should contact HS-22. HQ works with sites visited to write up best practices, coordinate resources, and share information both within the facility and with other facilities. HS-22 is actively soliciting volunteers to present at future FEWG calls and develop case studies: contact Josh Silverman or Jeff Eagan.

Questions from the field:

Patty Hunt noted that TJ has been having trouble identifying a vendor willing to accept and recycle contaminated SF₆. She asked for suggestions from the FEWG members.

Answer: Steve Lowder said BPA uses Dilo for SF₆ recycling. Their Dilo contact is Lucas Rothlisberger; 727-232-0050; lucasr@dilo.com; <http://www.dilo.com/services.html>

DOE Fugitive Emissions Data Analysis and Verification: Jason Marcinkoski (SPO):

Jason presented an overview and observations of the GHG data validation process. The Verification Team met for a week to sample site records and was made up of the following:

- A representative from the Office of Engineering and Construction Management (OECM) within the Office of Management
- A representative from the Under Secretary of Energy
- A representative from the Under Secretary for Science
- A representative from the National Nuclear Security Administration
- An observer from the SPO

Additionally, representatives from the Office of Fossil Energy, the Office of Environmental Management, and another NNSA staff person assisted the Verification Team. The Team had

high confidence in the values reported for scope 1 fuel emissions and scope 2 emissions from electricity, steam, and chilled water, but lower confidence in the values reported for scope 1 fugitive emissions.

To verify the fugitive emissions, the Team sampled four elements: SF₆ records at three sites and HFC-143a and HFC-134a records at one site. The lower confidence in the fugitive emissions values was primarily caused by disagreements between the values available in the PPTRS records and the data recorded on the sites' underlying records. Jason noted that the underlying records were found to be adequate and that this discrepancy may have been due in part to the timing of the verification effort since PPTRS data corrections were still being turned in concurrent with the verification process. While all of the examined underlying records were found to be adequate, the Verification Team faced the challenge that each site used different records to track and calculate their SF₆ emissions, including process-specific white papers, purchase records, and intrasite transfer records. John Yates commented that he served on the Verification Team and noted that making sense of SF₆ records can be especially complicated if the site purchases SF₆ in bulk and then slowly uses the inventory in various applications across the site. The Chair reminded the FEWG that the varying inventory methods have been, and will continue to be, discussed during FEWG meetings.

Jason added that there are plans to improve both the inventory and the verification processes based on lessons learned during the recent efforts. Plans are still being developed, but a few known plans include making sure that all final PPTRS records have been received before starting the verification process, and developing guidance on fugitive gas record keeping. Jason noted that they hope to have help from the FEWG when developing the records guidance. The Chair invited Jason and other representatives of the SPO to continue participating in the FEWG and to utilize the collective expertise of the FEWG members.

Site Presentation: Keith Rule (Princeton Plasma Physics Laboratory)

Reducing SF₆ Emissions @ PPPL (See previous PowerPoint attachment sent to FEWG members.)

- PPPL was shocked when they first discovered the percentage of their GHG inventory attributed to SF₆. When this information was shared with the end-SF₆ users, they immediately began brainstorming and making plans to reduce SF₆ emissions. All reduction activities to date have come out of the end users' budget.
- The SF₆ reduction process at PPPL includes: purchasing new leak detectors (<\$200), using the detectors to find the leaks, fixing the leaks, improving the inventory process, and re-engineering some of the SF₆-containing components.

- PPPL improved the inventory process by recording the actual weight of the cylinders before and after use on-site. One pound of SF₆ makes a large difference in the overall inventory, so the extra time it takes to weigh the cylinders and to record the data were determined to be well worth it.
- Re-engineering the systems has just started:
 - Pressure relief valves – plan is to change the system from venting to atmosphere to venting to a bladder. Gas in the bladder will be monitored and then processed by the portable Dilo SF₆-recovery cart (see below). PPPL just purchased and tested the bladder.
 - High voltage switch tubes – plan is to redesign and replace components of this equipment, including using leak-tight tubing and better fittings and seals
 - High capacity recovery system – plan is to purchase a new Dilo system (see below) to replace the old, leaky, and inefficient system currently in place (over 30 years old)
- Dilo Mini Plus D-320 Portable Recovery Cart
 - 1 person can operate this cart easily and folks are very happy with the cart
 - PPPL has owned the cart for more than 10 years without a major problem – the biggest problem was a flat tire
- High capacity Dilo recovery system
 - The system is oil-less, refrigeration-less, requires no manual operation or supervision, and claims to reach 99.99% recovery – all considered huge improvements over the current system
 - System costs approximately \$160,000. PPPL is looking for DOE funding, but is committed to finding the funding elsewhere if necessary

Questions from the field:

What is the lifetime of this kind of recovery equipment? Over how many years can you amortize the investment?

Answer: Lifetime is probably around 20 years.

How did you come up with the bladder idea? Have you spoken with Jefferson Lab about their experiences with bladders for capturing SF₆?

Answer: An engineer suggested the bladder during a brainstorming session last year. Keith and Kevin Jordan from Jefferson Lab arranged to have an off-line conversation.

How big is the bladder and what material is it?

Answer: The bladder is 4' by 4' by 6' (approximately 3 cubic meters) and the material is 50 mil vinyl.

The Chair noted that the emissions reduction process implemented by PPPL seems to be a good formula: complete an inventory, improve the inventory process, perform leak detection and leak repair activities, and evaluate and prioritize re-engineering opportunities. The Chair also thanked Keith and PPPL for sharing their SF₆ reductions efforts and progress while still in the process of making the changes. He encouraged others to share their approach, or to offer suggestions for FEWG agenda items and projects.

The next FEWG meeting is Thursday, April 14, 2011 from 11am until Noon ET. Note that this is a change from the previous schedule. There will not be a meeting in March. The April agenda may include an analysis of the SSPs received and a presentation from the field.

Contact information:

Josh Silverman, FEWG chair	josh.silverman@hq.doe.gov	202-586-6535
Jeff Eagan	jeff.eagan@hq.doe.gov	202-586-4598
Corey Buffo	corey.buffo@hq.doe.gov	202-586-9661
Keith Rule	krule@pppl.gov	609-243-2329
Jason Marcinkoski	jason.marcinkoski@ee.doe.gov	202-586-7466