Notes from February 9, 2012 DOE Fugitive Emissions Working Group Meeting

Updates (Josh Silverman, FEWG Chair)

The Chair welcomed everybody to the first call of 2012. Since the last FEWG call (November 2011), emissions data were reported through CEDR, and the SSPs have all been turned in. The SPO has completed the tentative FY 2011 DOE GHG inventory. The total FY 2011 emissions are around 4.1 million $MTCO_2e$, which is a slight increase from the FY 2010 total emissions, but still 11-12% lower than the FY 2008 baseline inventory. Fugitive and SF_6 emissions currently appear to follow the same pattern of higher emissions in FY 2011 than in FY 2010, but still much lower than in FY 2008. The Chair noted that the HSS team has not yet been able to take a good look at the SSPs and individual site-reported GHG emissions, but expects that by now the sites have a better sense of the underlying causes of fugitive emissions and reduction methodologies. The Department is particularly interested in determining what the fugitive emissions steady state will look like after implementing all planned operational and recapture changes. This will inform DOE and site-specific future goals and emissions projections, and should be reflected in the SSPs.

The Chair invited the FEWG to share information and insights into their sites' anticipated fugitive GHG emissions steady state and proposed and/or expected equipment upgrades. He also requested from the FEWG feedback on this year's reporting process using CEDR. These comments will be used to improve the process going forward.

Office of Science Perspectives on SF_6 (Scott Davis, Accelerator Safety Program Manager, Office of Science)

Scott Davis runs the Accelerator Safety Working Group for the Office of Science (SC). Four or five years ago, SC began running workshops in order to provide a forum for the accelerator community to discuss safety issues. At this time, the working group/forum participants determined that they needed a better way to identify and account for leaks. Two to three years ago, the forums grew in size and scope and began paying attention to SF_6 and other gas inventories and record keeping. This working group is working to improve the dialogue with NNSA. In 2008, the Accelerator Safety group was nervous about how the SF_6 emissions totals would look in aggregate. In 2009-2010, the Accelerator Safety group tried to improve communications and sharing of best practices to decrease emissions. The group attempted to better define the baseline emissions despite trouble identifying material balances due to not knowing whether the "empty" returned cylinders were truly empty. The group has also identified older equipment as an emissions liability and is attempting to improve de-inventory efforts. Scott noted that he often receives questions concerning perceived discrepancies between the ORPS reporting criteria and the GHG reporting criteria. He explains to the questioner that while the same gases may be reported in both programs, ORPS is for reporting discrete releases and the GHG reporting includes the discrete releases plus the quantities of gas released through slow leaks or other activities. Scott requested the FEWG help him provide a

better answer concerning ORPS and GHG reporting if any of the members have a better understanding.

The Accelerator Safety Working Group is helping Fermilab determine what to do with the equipment and materials, including SF_6, from the Tevatron, and trying to identify reuse opportunities at other sites. The group worked with EM on similar gas recovery during D&D of the gaseous diffusion plants in order to try to transfer the gas to SC sites. During this process, the group identified a potential problem that once the gas is declared "waste" by the host site, it has to be disposed of per procedures that generally do not allow for transfer as a method of disposal.

Scott expressed interest in giving sites credit for using SF_6 from ORNL and/or Fermilab and wondered what DOE was doing to incentivize the sites to reuse gases across the complex. Dave Northacker remarked that sharing gas between laboratories needs to be done with great care because of the highly specific parameters for use at each location. He suggested that it may be better to send the gas back to the local distributors.

Scott invited the FEWG to participate in the next Accelerator Safety Workshop, which is tentatively to be scheduled in August or September. The Chair suggested SF_6 emissions control is a high priority for the FEWG and that the FEWG would be happy to help with the workshop. It was also decided that the Accelerator Safety Working Group and the FEWG would exchange contact lists to try to develop synergies between the two groups at the sites.

Status Update: Princeton Plasma Physics Laboratory (Keith Rule, Princeton Plasma Physics Laboratory)

PPPL continues to see improvement in their SF_6 emissions values. In FY2011, SF_6 emissions were at 35% of the 2008 baseline level. For the next two years, SF_6 emissions should be at or close to 0 because no operations are scheduled due to the planned research upgrade. There will likely be a spike in emissions in a few years when operations resume and the systems are filled. PPPL is also continuing to redesign the O-rings and will incorporate these changes on the new neutral beam equipment to ensure that the new equipment meets the non-leaking standards set by the rebuilt equipment. The neutral beam group is really focused on SF_6 and avoiding emissions, and the operators throughout PPPL continue weighing cylinders for inventory management. One operator spends about two hours each morning checking all the valves and gauges.

PPPL decided not to purchase the new Dilo recovery system and instead refurbished the existing recapture system – the system was able to recover all of the gas from the existing equipment. The bladder system is now operational and connected to the relief valves. Gas levels in the bladder are recorded daily and a portable recovery cart is used to remove the gas when it reaches a certain level.

Scott Davis asked if PPPL is connected to the accelerator community [outside of the FEWG] and if PPPL has any interest in reusing SF_6 from elsewhere in the DOE Complex.

Keith indicated that PPPL is not connected to the accelerator group even though they use similar equipment. He also noted that they probably could use used SF_6 because PPPL only uses is as an insulator gas, but figures that sites are better off returning the gas to a local distributor if possible because that avoids having to transport the gas.

Fermilab's Refrigeration Management Program (Amber Kenney, Fermilab)
(See attached presentation)

Fermilab's focus is changing to the "intensity frontier" and they are transitioning to neutrino experiments. Refrigerants are used extensively onsite in chillers and HVAC systems. To manage refrigerant emissions, Fermilab stores all of the refrigerants in one central storage location and limits removal of the gases to certified technicians. The Refrigerant Manager (RM) is responsible for maintaining the storeroom inventory, ensuring that only certified technicians receive the gas, maintaining the refrigerant compliance database, and requesting leak monitoring plans for leaky equipment. The database tracks refrigerant volumes used on a per-piece of equipment basis; however, the RM also often identifies troublesome equipment before the database does.

An example of a monitoring plan in action is the one in place for the D0 chiller. This chiller is a backup chiller for the Tevatron that is used during the hot summer months. The RM noticed that the technicians were frequently requesting small amounts of R22 for use in D0 and requested the monitoring plan before the database noticed a problem. D0 operators are attempting to limp along with the leaky chiller because the Tevatron and its associated equipment, including the D0 chiller, will be going out of service after the summer. The monitoring plan stipulates that operators will log compressor pressures once per shift and will take action if the pressure decreases 10 psig. An engineer will review the logs twice per month and the leak will be checked once per month.

The plan for management of the GHGs used by experiments but not already managed by the RM is to start adding these GHGs to the refrigerant management system or to create a new but similar program. This plan is still in the consideration phase and the planners are trying to decide under which section to create the program. The RM knows every pound of gas that is used at Fermilab; this is the primary element that they want to retain in the GHG management program.

Closing Remarks (Josh Silverman, FEWG Chair)

The Chair thanked all of the participants and presenters. He commented that Amber's presentation continued the discussion of non-SF_6 refrigerants from the last meeting. It is good to see some synergies and opportunities to learn from the older ODS management systems.

The next FEWG meeting is tentatively scheduled for Thursday, April 12, 2012 from 11am until Noon ET. HSS will likely be reaching out to sites for clarification and additional information as

the reported emissions data and SSPs are reviewed. Please contact Josh Silverman or Jeff Eagan (contact information below) with any suggestions for topics or presentations for future FEWG calls.

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