



# Fugitive Emissions in 2010 Site Sustainability Plans

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# Scope of Analysis



- In-depth review of SSPs from 11 sites
  - LANL
  - LLNL
  - SNL-NM
  - Y-12
  - SRS
  - ANL
  - BNL
  - FNAL
  - ORNL
  - PPPL
  - SLAC
- Emphasis was on the sites with large SF<sub>6</sub> emission inventories
- Looked for commonalities, best practices, alternatives, and challenges to reducing emissions



# Accounting Method



- Over half of the SSPs reviewed discussed the approach used to determine the site's SF<sub>6</sub> emissions
- Of those reporting, sites used a variant of a mass balance approach. Examples include:
  - Purchases and disposals tracked via a chemical management system
  - Cylinders weighed when put into and removed from service
  - Cylinders weighed periodically
  - Purchases and operational releases tracked
- Benefits of improved accounting methods:
  - More accurate inventory assessment
  - Aid with identification of repair and maintenance needs



# Progress in Reducing SF<sub>6</sub> Emissions



- Sites comparing FY10 emissions to the FY08 baseline reported SF<sub>6</sub> emissions decreases ranging from 16.5% to 97%
- Decreases attributed to:
  - Reductions in purchases
  - Identification and repair of leaks
  - Rebuilding of circuit breakers
  - Installation and use of recapture equipment



# SF<sub>6</sub> Substitutes



- Sites discussed potential substitutes considered for a variety of applications
  - Plasma etching: Trifluoroiodomethane (CF<sub>3</sub>I)
  - Tracer gas: Nitrous oxide (N<sub>2</sub>O), pitot tube (detects fluid velocity)
  - Electron beams: Thermionic gun (uses no SF<sub>6</sub>) versus a polarized gun
- Generally, substitutes could potentially displace only a small fraction of SF<sub>6</sub> emissions
- More significant reduction opportunities must be realized through improved SF<sub>6</sub> management practices



# SSP Highlights



- ANL set an ambitious and achievable 90% reduction goal
- LLNL incorporated SF<sub>6</sub> into its EMS
- PPPL incorporated routine daily rounds to improve identification of leaks and prioritize repairs
- Both PPPL and SLAC regularly weigh gas cylinders to improve fugitive emission accounting
- Y-12 decreased fugitive emissions by 97% between FY08 and FY10 (reduced solvent use)



# Path Forward



- Several sites with programs underway have conducted opportunity assessments and listed specific planned projects to target reductions
- Sites developing SF<sub>6</sub> management programs identified the following objectives:
  - Improve tracking of inventory and release amounts
  - Conduct pollution prevention opportunity assessments
  - Develop leak detection procedures
  - Prioritize repair and replacement of leaking equipment



# Recommended Actions



- Integrate fugitive emissions into site EMS program
  - Conduct opportunity assessments
  - Identify reduction targets and program to achieve them
  - Modify processes and procedures to reduce releases
  - Monitor, review, and improve as appropriate
- Include fugitive emission reduction targets in 2011 SSP
  - Identify planned actions and reduction targets
  - Describe actions taken to address fugitive emissions
  - Document successes and lessons learned
- Participate in FEWG and other opportunities to share information with other practitioners



**For further information**



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