

**B O N N E V I L L E**  
**P O W E R A D M I N I S T R A T I O N**



***Bonneville  
Power  
Administration***

***SF<sub>6</sub>***

***Management and Monitoring Program***



***BPA covers a service area of over 300,000 miles in the Pacific Northwest.***

***Coverage area includes Washington, Oregon, Idaho, Montana, and parts of California. +***

- 320 Substations.
- 774 SF<sub>6</sub> High Voltage Circuit Breakers
- 306 SF<sub>6</sub> Current Transformers
- 4 SF<sub>6</sub> Gas Insulated Substations (GIS)
- 9 SF<sub>6</sub> High Speed Ground Switches



# BPA Signed Memorandum Of Understanding (MOU) with EPA and joined as a Partnered Utility.

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MOU required submitting the following information in an Annual Report:

- *Total amount of SF<sub>6</sub> gas contained in equipment in service.*
- *Weight of SF<sub>6</sub> gas used to return equipment to normal service.*
- *Average leak rate over the past year.*
- *Cumulative leak rate since beginning of program.*
- *List of equipment replaced.*



# SF<sub>6</sub> Loss Trending 1999-2001

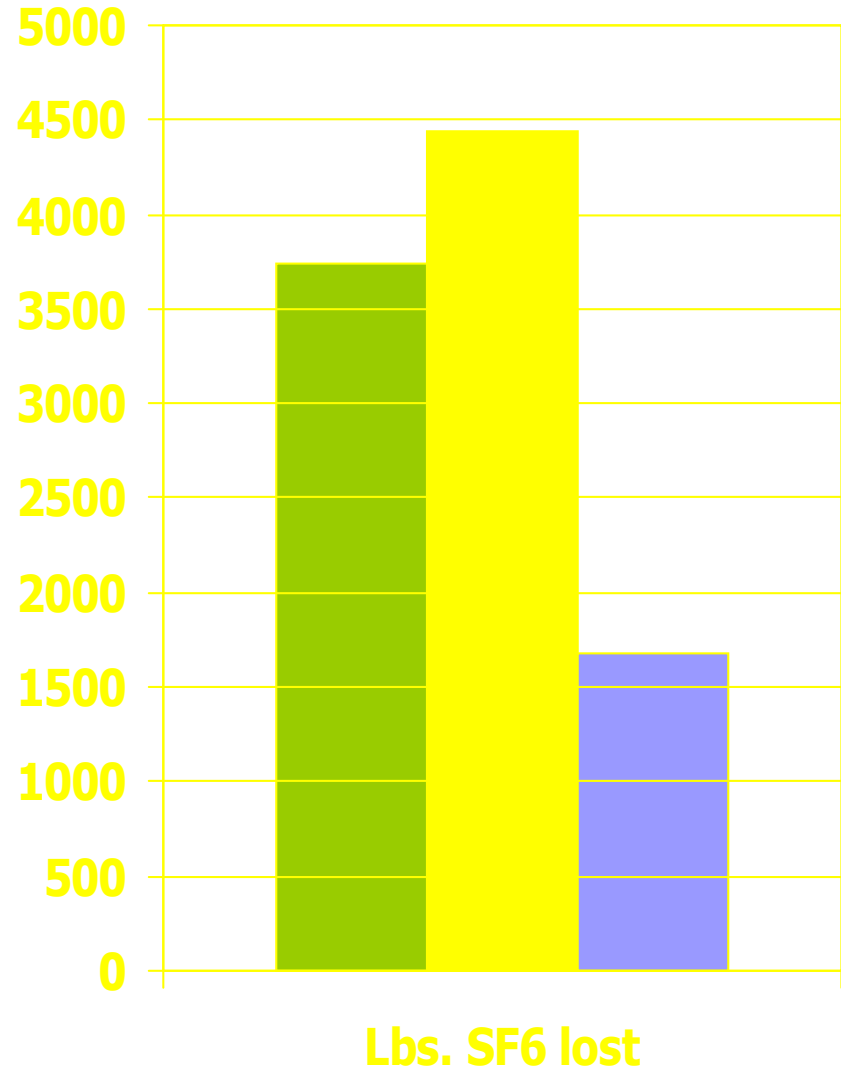
Factors such as:

Increased diligence by  
Maintenance workers

Equipment replacement

Milder temperatures in the  
Northwest

have allowed BPA to  
make a significant  
reduction in SF<sub>6</sub> gas  
loss in 2001.





# ***BPA's SF<sub>6</sub> Program Goals***

***Reduce SF<sub>6</sub> Emissions through leak reduction.*** +

***Reduce SF<sub>6</sub> inventory.*** +

***Develop SF<sub>6</sub> leak tracking program.*** +



# ***SF<sub>6</sub> Inventory Reduction***

*Replace older SF<sub>6</sub> equipment with newer technology which requires less volume of SF<sub>6</sub> for dielectric insulation. +*

*New equipment is being manufactured to a higher standard for minimal allowable leak tolerances.*



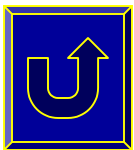


# *SF<sub>6</sub> Leak Reduction*

*Improve maintenance practices for SF<sub>6</sub> handling. +*

*SF<sub>6</sub> leak tracking program. +*

*Increase awareness of SF<sub>6</sub> handling and Environmental concerns.*



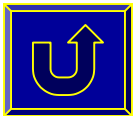
*Utilize contract Laser SF<sub>6</sub> Leak Detection Services*



# Improving Maintenance practices:

*Instruct Maintenance personnel in safe gas handling practices through training.*

*BPA has a library of Technical Information and Standards (SPIF's) that are followed for the safe and efficient methods of SF<sub>6</sub> gas handling. These documents are designed to inform the Technician on hazards involved, the most efficient methods of gas handling to minimize loss, and leak detection.*



*Utilize improved technology in gas handling and detection equipment.*





# BPA SF<sub>6</sub> Leak Tracking Program

*The basic layout.* +

Database





# BPA SF<sub>6</sub> Leak Tracking Program

*As a tool for improving leak reduction.*





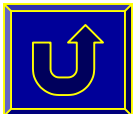
# BPA Network Database

Each District has it's own folder on network. +

Spreadsheet in folder is set up to record:

**District / Date / BPA# / Substation / SF<sub>6</sub> Filled**

BPA # of equipment is used to cross-reference to equipment model and make for research purposes.





# Summary:

BPA goal is to maintain a leak rate of less than 1%.

2001 showed a significant drop in emissions, we are awaiting the 2002 report to determine the ability to maintain the level of .39% achieved in 2001.

At Bonneville Power Administration, we take pride in being an Environmentally conscious entity, and we will continue to strive to lead Utilities in SF<sub>6</sub> management and emission reduction.

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***Serving the Pacific Northwest***