SF₆ Gas Management Solutions
Managing SF₆ Services in Switchgear
ABB offers a complete SF$_6$ gas management solution, in an efficient and environmentally friendly manner, from installation to decommissioning.

With the largest installed base of high voltage circuit breakers in North America, ABB is widely known for its switchgear expertise.

ABB High Voltage Service (US) started offering SF$_6$ gas management services in 1998. The portfolio has expanded to include advanced technical solutions, environmental services, and equipment which is available for purchase or rent.
If these are questions you and your company struggle with, ABB’s environmental service can help your organization. ABB offers a complete SF₆ gas management solution, supporting our customers with the handling and management of the gas in an environmentally friendly and compliant manner.
ABB's complete SF₆ Gas Management Services include but are not limited to:

- Start-up SF₆ gas handling service
- Decommissioning service
- Cylinder consolidation
- Leak detection
- Onsite SF₆ gas analysis
- Equipment sales and rental
- SF₆ gas monitoring
- SF₆ gas cart evaluation
- Reclamation services
- Purification
- Training on SF₆ handling
- Recycling
- SF₆ tracking
The benefits of using ABB’s SF₆ gas management solutions include:

- **Lower risk**
  - Improved Safety performance
  - Reduced risk of noncompliance to existing and future climate change regulations
  - Adherence to regulatory standards
  - Use ABB’s qualified service technicians
  - Make reporting to the authorities easier

- **Reduce costs**
  - Reduce maintenance and replacement costs
  - Outsourcing or partnership opportunity
  - Improve protection and extension of product life
  - Enhance asset management capabilities

- **Decrease carbon footprint**
  - Support environmental policy objectives
  - Reduction in greenhouse gas emissions
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| **Start-Up Services**        | Using ABB’s expertise, you can be sure your SF₆ equipment will be filled properly. Without the proper training, it is easy to accidentally introduce moisture and air into the equipment at the initial filling. | - Trained and expert personnel to fill switchgear  
- Follow EPA, CARB, and RGGI regulations  
- Operator and safety orientation training                                                                                                       |
| **SF₆ Decomposition Analysis with Leak Detection** | Using portable equipment, lab like results can be quickly and easily confirmed. Additionally, ABB offers decomposition analysis services and leak detection. If gas is able to leak out of a piece of equipment, then moisture and air can enter in it as well. | - Market leading technology used to pin point leaks  
- Gain knowledge of circuit breaker’s internal health  
- Correct the ‘bad actors’ on the system                                                                                                       |
| **Leak Remediation**         | ABB works to eliminate the true cause of the leak, be it corrosion, exposure to harsh environments, fitting tightness, porosity, misuse, etc. We can provide technical expert assistance or a turnkey solution to repair the leaks and purify the contaminated gas. | - SF₆ switchgear service expertise  
- Immediate access to OEM parts on stock  
- Test SF₆ to verify gas integrity post leak repair  
- Verify leak elimination with a portable leak detector                                                                                      |
| **Cylinder Consolidation**   | Up to 15% of SF₆ can be left in an empty cylinder. The residual gas is called a ‘heel’. ABB will reclaim the residual SF₆ gas, minimizing the number of gas cylinders purchased. Additionally, if the heel is not collected, it must be reported as an emission to the EPA. | - Estimated cost savings is 10% for every cylinder purchased  
- Typically, for every six partially filled cylinders, cylinder consolidation can return a full cylinder  
- Reduce emission amount reported to EPA                                                                                                       |
| **Decommissioning**          | For end of life cycle switchgear, we offer decommissioning services. SF₆ gas will be removed and stored in transportable cylinders to be reused or purified for reuse. A sample may also be tested to reveal the amount and type of contamination if any is present. | - Removal and recycling of SF₆ gas  
- Gas analysis information can provide information about end of life switchgear  
- Follow EPA, CARB, and RGGI reporting rules  
- Offers hands-off approach to removing switchgear from service                                                                 |
| **Compliant Disposal**       | Disposal services are available in cases where the SF₆ cannot be purified or reused. Allow us to dispose your gas and provide the proper documentation stating the quantity of SF₆ gas disposed so that correct reporting of emissions can be provided to the EPA. | - Oursource responsibility to switchgear experts  
- Follow governmental disposal regulations  
- Provide proper documentation for emissions reporting                                                                                       |
| **Tank Recycling**           | ABB will purchase/provide credit for empty SF₆ cylinders.                                                                                                                                                  | - Reduced carbon footprint  
- Credit provided for waste  
- Eliminate SF₆ ‘graveyards’ of empty cylinders                                                                                               |
| **Equipment Rental or Sales** | Typical equipment rentals include gas carts, and test equipment. Rentals can be charged on a weekly basis or monthly basis.                                                                             | - Reduce asset and maintenance costs  
- No maintenance costs on equipment  
- Reduce equipment inventory levels                                                                                                             |
| **Gas Recycling - Reclamation and Purification Services** | ABB offers on-site and off-site gas handling services to reclaim, recycle, and purify the SF₆. The reclamation process involves removal of the gas, filtration, and restoration. This is often performed in conjunction with maintenance. Recycling gas involves removal of the gas, with an option for ABB to purchase or provide a credit for used SF₆ gas. This must be performed if air is present in the SF₆ gas. | - Return equipment to operational state  
- Extend life of equipment  
- Gain knowledge of circuit breaker’s internal health through sample gas testing  
- Follow EPA, CARB, and RGGI reporting rules                                                                                             |
| **Training**                 | Training on proper SF6 gas handling procedures is essential to switchgear life extension and maintaining switchgear effectiveness. This two-day course is a hands-on way to learn how to reduce contaminants and emissions during filling, filtering, testing, and removal. | - Become trained by our expert field service engineers  
- Hands-on workshops included  
- Learn best practices from switchgear experts & network with industry professionals  
- Earn CEU’s or PDH’s with course certificates provided free of charge                                                                           |
| **SF₆ Tracking**             | Using a mass balanced system approach, SF₆ gas can be tracked throughout your system.                                                                                                                                 | - Allows for easy reporting to EPA, CARB, and RGGI                                                                                           |
FAQ’s

How do ABB’s SF₆ start-up services differ from other providers?
ABB will continue to deliver the same high quality OEM field service for commissioning high-voltage switchgear as we always have. Taking that one-step-further, ABB understands the reporting requirements that you must deliver to the EPA and others. SF₆ cylinders are weighed before and after filling so that each pound of gas is accounted for. We put the right amount of gas in the breaker without over or under filling! SF₆ gas emissions are avoided by employing the best SF₆ handling procedures known to this industry and by using the best available SF₆ handling and test equipment. Additionally, we offer to train your crews on our handling procedures. ABB strongly believes that a well-trained workforce that continuously demonstrates conscientious work habits is the cornerstone to success.

How can I receive onsite instantaneous laboratory “like” SF₆ gas analysis to determine the integrity of my fleet of circuit breakers and GIS equipment?
ABB continuously strives to find, test and verify the best available SF₆ decomposition analyzers. We currently use decomposition analytic equipment that provide lab like results using only one 250cc of SF₆ gas. We additionally offer zero waste or pump back featured equipment that will pump back the test gas back into the switchgear.

The equipment capabilities include onsite testing for:
- SF₆ gas purity (0 -100%)  
- Air (0-50%)  
- Dew point (-60 to +20C)  
- SO₂ (0 to 150 ppm)  
- HF (0- 200 ppm)  
- CF₄ (0 – 65%)  
- R-12 (0 – 250 ppm)  
- CO (0-1000 ppm)  

Eliminating SF₆ gas leaks is very important to my company. What detecting methods does ABB use to find those leaks?
In short ABB uses all available methods. When HV equipment must stay in service, we use a laser camera with capabilities to allow the operator to stand on the ground and “shoot” and record your complete substation’s SF₆ equipment for leaks or verify that leaks are not present. When leaks are present at an electrical ground level we use hand held leak detectors. Hard to find leaks may require an extra effort which may include “bagging” exterior seal locations or using soap solutions. Our deliverable to you will be a well-documented report that clearly identifies each specific leak location with a follow up of parts that may be required to permanently eliminate your emissions.

Can ABB provide continuous SF₆ monitoring for my circuit breakers and GIS equipment?
ABB developed a cost-effective SF₆ monitoring solution for use on new products or retrofits. We have many requests for this product due to EPA emission standards and environmental commitments by our customers. The CBS-F6 includes features that accurately monitor temperatures, gas pressure, density, leak rate and amount of SF₆ emitted by the equipment it is installed on.

How can ABB help with all the partially filled and empty cylinders in my inventory?
Working with a full-service gas management solution provider such as ABB to manage your inventory will save you money every year in at least four ways:

1. Heels will be accounted for properly, which can be sold through buy-back services, or reclaimed and consolidated into full cylinders lowering your overall demand, and producing a net savings.
2. An accurate inventory accounts for gas used and residual amounts. Without adjusting for false empties, the heels will be reported as emissions on your annual report.
3. Also, recycling and purifying of SF₆ is an available service from ABB. This is the most environmentally safe and cost-effective manner of reducing (potentially) unusable inventory.
4. Outsourced employees become your detail experts, further reducing specialized training expenditures as your personnel focus on your core business.

I plan to replace older technology switchgear from my substations, but I have concerns about my available resources and the environmental aspects of the removal. How can ABB help?
In most instances the removals will be one of three interrupting technologies; air-blast, oil or SF₆ gas. An addition concern might be free standing current transformers that would either be filled with oil or SF₆ gas. Each removal has its specific environmental procedures and safety concerns. You may be asking yourself about the release of stored energy or how to effectively recycle the oil and SF₆ gas. ABB retains the expertise to walk you thru each specific situation and provide to you trained resources and equipment to tackle any job. We will help you plan and execute the workscope to meet your schedule.

What are EPA, CARB and RGGI reporting requirements?
The EPA and CARB currently mandate SF₆ emission reporting.

EPA general requirements:
- User reporting threshold is 17,820 lbs. of nameplate SF₆ gas.
- Reports due March 31 in following year
- Penalties do not apply

CARB has the more stringent requirements:
- User reporting threshold is “any amount”
- Reports due June 1 in following year
- Violation for each day being late.
- Emission rate no more than 10% in 2011 and reducing 1% per year until 1% in 2020
- Leak rate to be measured for each specific serial number
- Cap and Trade (90/10) auction held on 11/14/2012

RGGI Inc., a nine (9) state corporation created to support development and implementation of the (RGGI). RGGI Inc. has no regulatory or enforcement authority as all sovereign authority is reserved within each state. The RGGI has implemented a mandatory cap-and-trade program.