2014 Workshop on SF₆ Emission Reduction Strategies
Siemens SF₆ Gas Density Monitoring
The purpose of any Condition Monitoring (CM) system should be to provide information with one aim

…Present information to enable prediction of the time to intervene

and give guidance on intervention required.

Our approach to Condition Monitoring to support in the context of a High Voltage Electrical Network focuses on 5 key areas:

• Optimization of Maintenance regime
• Improved Risk Management
• End of Life prediction
• Knowledge transfer
• Enhanced rating
“We have survived for over forty years without Condition Monitoring, why do we need it now?”

- We are facing new challenges and old ones are increasing
- Reaching asset design life
- Environmental impact - us on it and it on us
- Moving towards a dynamic network
- Stakeholder expectation - Regulation, Shareholder, Customer, Increased accountability, etc
- Offshore – conventional routine inspections not viable
- Cost reduction – Capital, operational, resource
- Capture and application of knowledge and experience
- Smaller work force
2014 Workshop on SF$_6$ Emission Reduction Strategies
Siemens SF$_6$ GDM System – Industry Drivers

Recent European legislation has targeted greenhouse gasses such as SF$_6$. Current European directive to reduce emissions to 0.5% per annum.

SF$_6$ Gas Density Monitoring System allows for:

- Proof of performance
- Strict accountability of gas use
- Visibility of primary leaking zones so that they may be targeted
- Planning of maintenance
- Alarm indication before excess gas is lost when first stage alarm is reached
- Quick and easy access to the latest data for all staff.
- Increasing environmental awareness
Since 2012 Our Vision and main focus areas remain unchanged, however, we have learned a great deal about what our customers need and more importantly what they don’t need. Our key learning points are as follows:

- SF$_6$ Monitoring is not suitable for every Substation owner
  - Without Policies & Procedures that govern how to use the data, investment is pointless.
  - Confidence is key – A system alarm should not be met with “What’s wrong with my SF$_6$ Monitoring system”.

- Front-end System simplicity is essential for wide-scale user buy-in.
- A system is only as accurate as the transducer selection (question anything that claims better than 0.5% accuracy).
- Innovative users want more than just SF$_6$ Monitoring – Condition Based Asset Management
The goal of condition monitoring is asset performance management!

- **Condition monitoring**
  Providing peace of mind for *operation* and supply of high quality input for …

- **Asset data management**
  Providing peace of mind for both *asset management and operation* plus management of all information at one place for …

- **Asset performance management**
  with most efficient improvements for:
  - maintenance planning
  - asset reliability, risk management
  - asset management (PAS55)
  - CAPEX and OPEX planning
  (capital and operational expenditures)
Risk Centered Asset Management

**Offers**
- Present health indexes and forecast
- Present risk evaluation and forecast
- Strategic risk analysis
- Next maintenance

**Based on**
- Online condition parameters
- Offline condition parameters (measurement)
- Asset information (e.g. SAP stored data)
Questions?