



Energy Maintenance Technologies Ltd

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GENERAL MANAGER
North and South American Operations

US EPA Presentation
Atlanta
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The EMT management team has over 45 years combined experience and a solid and unrivalled knowledge of the products in this market sector.

Our goals are to supply Maintenance engineers with the very best tools to protect both personnel and plant and in doing so minimize the Environmental Impact to our planet. That's why we are here.

Testing of SF6

- Despite the advantages of SF6-filled equipment....It's neither maintenance nor trouble-free !!
- **Testing and Planned Preventative Maintenance will:-**
- Improve Safety – From an Operative standpoint
- Minimize Environmental Impact
- Help identify Faults & Failure Processes
- Save Maintenance \$\$\$ with PM
- Improve Handling Practices
- Extends the lifetime of your assets – Due to an old aging network
- Conforms to IEC 60376/60480/61634 And CIGRE B3.02.01
- Currently a New Standard is being drafted by CIGRE B3 WG25

Our Technologies are an Asset Health Index portfolio and complete solutions for SF6 Inventory/Protection and reduction of this Global Warming Gas

- **SF6MPU**- Worlds first multi parameter SF6 Breakdown Test Set (up to 5 contamination gases in one analysis)-2009
- **SF6MFU** Mass Flow Controlling Devices for Top Up/Fill Operations- 2006 – Mitigating SF6 Inventory with Full Audit and Traceability Control
- **SF6CTU** Continuous Topping Up System 2009 – Topping up Circuit Breakers when an outage is not possible – National Grid/EPRI collaboration
- **SF6GCU** Gas Collection Unit 2008 – Recover y of SF6 after Analysis
- **SF6 AsserloyzIR** Late 2011 – World’s First and Only Multi Decomposition Patented Infra Red Analyser- 300 ml Gas sample – Lightest/Fastest/Portable and Most accurate on the Global Stage
- **SF6 ZERO-WASTE** – Available at **IEEE 2012** – Our top of the range analyser

EMT SF6 Portfolio

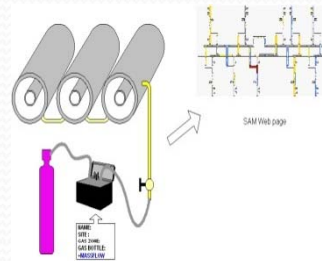


OUR INSTRUMENTS YOUR SOLUTIONS

Management of SF6 Decomposition products



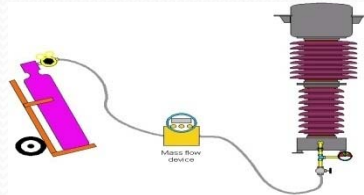
Testing to IEC/CIGRE and ASTM Methodologies – Utilizing our revolutionary Infra Red technology



Automatic SF6 Inventory Use in the Field – DEFRA (UK) and EPA (USA)



Leakage Management - utilizing sophisticated methods
Maximizing uptime within Planned Maintenance Schedules



GSM/GPRS Modularity –
Safety/Control/Traceability and Cost Savings-
A cradle to grave solution for SF6 management
and usage

The Demand for New Analyzer Technology

- Utilities have different drivers and Incentivised Schemes – As a technology company we were flexible to deliver on their requirements
- National Grid's Requirements were to fall in line with the F Gas Directive – EC842 and IEC AND CIGRE Guidelines
- Had to differentiate from other technologies available due to irregular trending patterns on existing based systems
- Has to be portable/Fast /Accurate and Light weight
- Has to meet with current IEC / CIGRE and ASTM Guidelines
- Has to be easy to use
- Has to be modular to fall in line with current reporting requirements
- Has to be an Environmentally friendly solution
- Has to show proven ROI's and Cost Savings

Integration into current working practices



- Analyzers have to be flexible to integrate with their information systems – MIMMS/ SAP/STOMPS- Southern
- Flexible Nomenclature options for traceability and audit ability
- Data Acquisition capabilities- Data means nothing without being able to interpret and make sense of the data that is being retrieved
- Smart Asset Management has allowed NGT to interpret data “Live” before the operatives leave the substation
- Combined with sensible and achievable Maintenance Frequencies

OLD VERSUS NEW



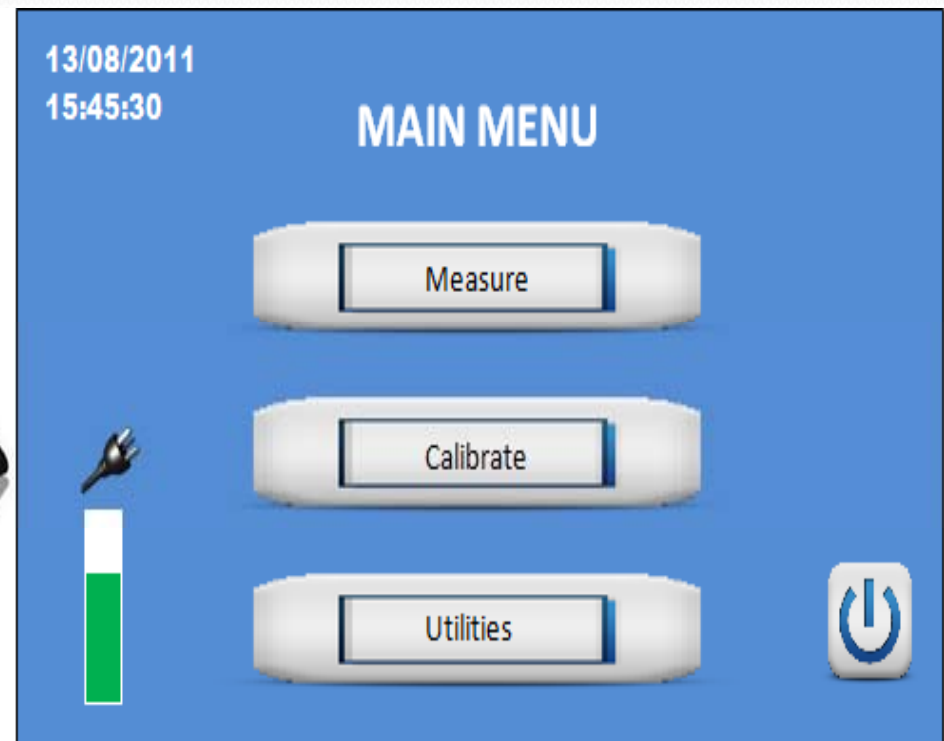
- We understand proven Electrochemical based systems and have designed them for quite some time
- We are aware of the potential of an Infra Red system capable of analyzing the current decomposition products accurately without drift and would be specific
- Understanding the need for ease of calibration in the field
- The technology took over three years to develop
- Had a long testing at Alpha and Beta stages of production
- Specific Repeatability and accuracy data was sought

- We understood proven Electrochemical based systems and have designed them for quite some time
- Were aware of the potential of an Infra Red system capable of analysing the current decomposition products accurately without drift and would be specific
- Understood the need for ease of calibration in the field
- Took two years to develop
- Had a long testing at Alpha and Beta stages of production
- Specific Repeatability and accuracy data was sought

NEW PRODUCT

asserolyzIR

One Button Operation

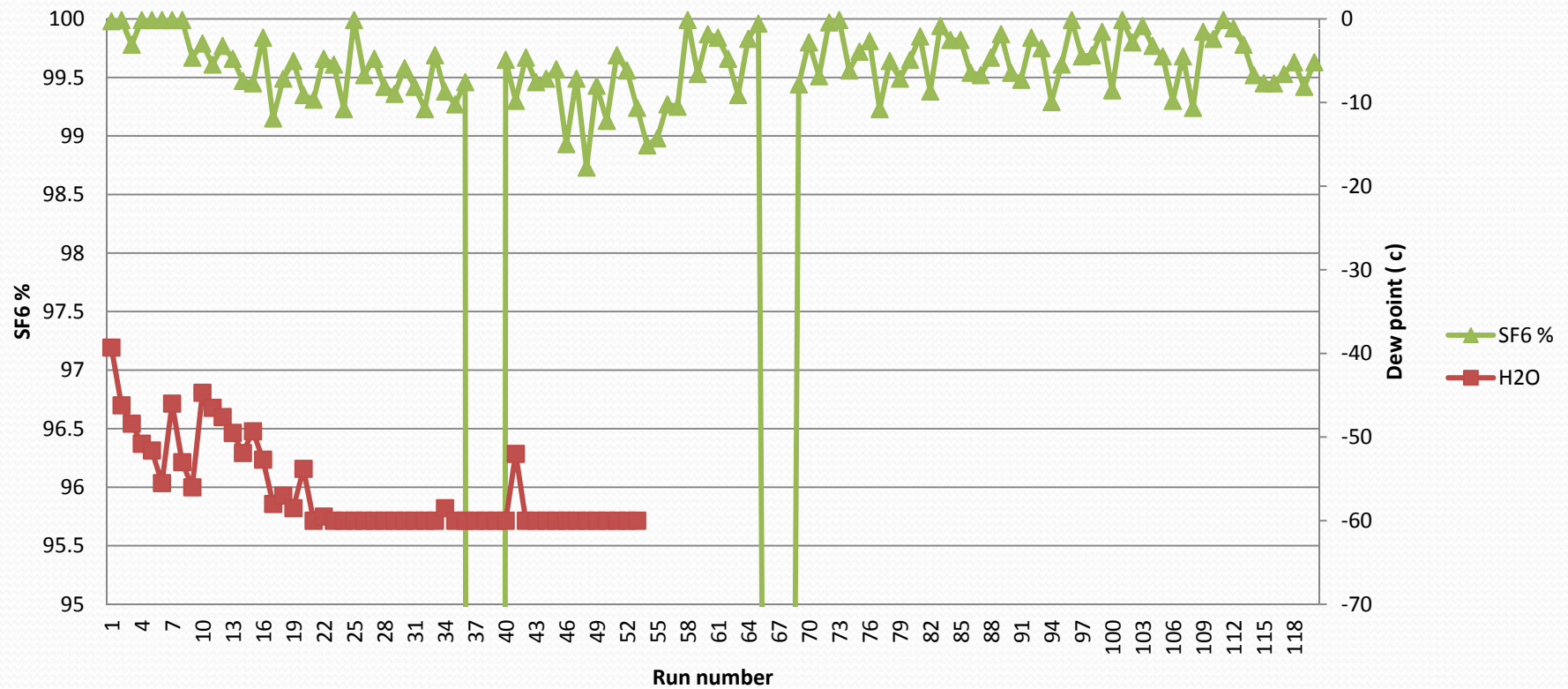


AsserolyzIR Performance



Number of tests on new bottle of SF6 =120
Standard deviation less than +/-0.21%

IR-SF6 test 09/09/2011



The Product – The lightest/Fastest and most portable unit that the market demanded.

The AsserolyzIR





The only portable IR Zerowaste Analyzer



The Worlds 1st Infra Red **Portable** Multi Parameter Automatic **Zerowaste** SF6 Analyzer (Automatic Return)

ZEROWASTE

asserolyzIR-Zerowaste



Auto Start:

Connect and walk away!

- Connect to the Circuit Breaker and the zerowaste automatically samples the SF6 gas, by detecting when gas is connected (by sensing the inlet gas pressure) and starting the preselected number of cycles automatically then pumping the gas back after the analysis.

ZEROWASTE

asserolyzIR-Zerowaste



Safe Distance Working:

- The zerowaste allows a safe working distance for the user. Once started, the unit will wait for 2 minutes before commencing the analysis, automatically.

ZEROWASTE

asserolyzIR-Zerowaste



Multi Analysis Operation:

- The user can select up to 5 cycles to run on the same sample. In fully automatic mode, the instrument will run the selected number of cycles then pump the gas back at the end. The user will then be able to view and save the results for the number of measurements taken.

ZEROWASTE

asserolyzIR-Zerowaste



- Pre set IEC/CIGRE/ASTM Methods- Plus 3 custom methods. Shows Pass/Fail results Red/Green
- Smallest amount of SF6 Gas Sample:- Only uses 300 cc's of SF6- suitable for low voltage breakers from 4kv to Supergrid Installations
- Works at very low pressures:- 0.03 Bar up to 10 Bar/145PSI

ZEROWASTE

asserolyzIR-Zerowaste



- Built in pressure regulation and measurement. Inlet auto gas pressure sensing-auto analysis
- The lightest “Pump Back” SF6 analyzer:- only 33lbs/15 kilos
- Fast analysis- 5 minutes per cycle
- Extremely accurate- laboratory quality analysis in a portable analyzer.
- Size- Dimensions:- (19.6”) x (12”) x (18”)

ZEROWASTE

asserolyzIR-Zerowaste



- Multi Sensor - Hi/Lo ppm Technology (So₂)
- Up to 10 gases- user selectable- IR₁ to IR₁₀.
 - SF₆ Purity 0-100%
 - Dewpoint 0—60DegC
 - SO₂ Low 0-20ppm
 - SO₂ High 0-150ppm
 - CF₄
 - HF
 - Air
 - CO
 - H₂S
 - R₁₂
- Leak Detection Probe Option- ppm/gms per year.

ZEROWASTE

asserolyzIR-Zerowaste



- USB data download:- up to 1000 sample results with *asserolyz-IR dataman* intuitive software.
- The only Fully Portable zerowaste IR SF6 analyzer: AC or Battery operated, even during gas recycling.
- Light and Robust:- Housed in a robust IP67case with wheels, retracting handle, pockets for hoses and spare parts.
- Gas Storage for up to 5 normal sampling cycles- excellent to check reproducibility and performance.

Conclusions-Zerowaste

- Up to 10 Gases Measured Simultaneously
- Auto Start/Auto Pump Back- up to 5 cycles
- Uses Advanced IR Absorption Technology
- Patented IR technology
- Less than 1L of gas used - 300 cc's
- 5 Minutes Measurement Cycle
- **Built in SF6 Leak Detection Option**
- **GSM/GPRS Technology**
- **A wide range of fittings available**
- Simple operation
- 8 hours battery operation
- Only 4lbs (Non-Return system) but includes gas collection bag
 - Zerowaste- 15kg or 33lbs (Zerowaste system)
- We can address Utility Nomenclature Reporting Requirements





Thank you for your kind attention

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