

## “Sea Marconi Solutions” vs “Fuller Earth treatments”

Benchmarking between different treatments techniques available for Life Cycle Management of Oils & Transformers

Key Factors	DMU & Integrated Treatments* Sea Marconi Patented	Treatment with typical Fuller Earth	Treatment with typical Fuller Earth and regeneration > 600-700 °C
Recovery: Physical Properties KV, DGA, H <sub>2</sub> O	✔ Yes	✔ Yes	✔ Yes
Recovery: Chemical Properties TAN, DF, IFT	✔ Yes	✔ Yes	✔ Yes
Removal: DBDS & Corrosive Sulfur	✔ Yes	✘ No	✘ No
Decontamination: Dissolved Metals	✔ Yes	✘ No	✘ No
Dehalogenation: PCBs/POPs in Oils	✔ Yes	✘ No	✘ No
Classification: BAT/BEP - Best Available Techniques/Best Environmental Practices (PCBs/POPs)	✔ Yes	✘ No	✘ No
Self-cleaning unit from: DBDS, PCBs/POPs	✔ Yes	✘ No	✘ No
<b>Cross contamination by DBDS, PCBs/POPs</b>	✔ Safety	⚠ Danger	⚠ Danger
<b>Corrosion by Sulfur Degradation by Products (SDBP) as H<sub>2</sub>S, Mercaptans, etc. due to high temperature (&gt; 370 °C – typical 600-700 °C)</b>	✔ Safety	✔ Safety	⚠ Danger
<b>Dioxins Emissions (PCDDs, PCDFs) due to high temperature degradation byproducts from PCBs/POPs and halogenated contaminants in Oils</b>	✔ Safety	✔ Safety	⚠ Danger

\*CDP Process® for PCBs/POPs chemical dehalogenation; CHEDCOS for DBDS & Corrosive Sulfur Selective Depolarization

### Example of Case history: «C3 - SDBP & Corrosive Sulfur» URUGUAY 2010



Post Failure diagnosis on a Grid Transformer showed signs of **electric arcs** on tap selector contacts. The failure has been caused by the formation of **Corrosive Sulphides** as CuS, Cu<sub>2</sub>S, Ag<sub>2</sub>S, etc. Indeed «At relatively high temperature, sulphur-containing oil molecules may decompose and react with metal surface to form **metal sulphides**» (IEC 60422 Ed. 4 – 2013 art. 5.17). This mechanism started together with the oil regeneration process with reactivation of sorbent and fuller earth column by uncontrolled combustion (> 370 °C). The Sulfur Compounds naturally present (DiBenzoThioPhene – DBTP, etc.) in the Oil and additives (DBDS, etc.) are decomposed in Sulfur Degradation ByProducts. *Other Ref. National Grid (UK), ABB*

(Sweden), 2010 Doble Conference (USA)

### Sustainable Solutions by Sea Marconi - Added Value for Customers, Holders & Partners:



Laboratory & Diagnosis

45 years of **Innovation for Life Cycle Management** of Oils & Transformers; Solutions based on Global and Integrated Approach, Case histories, **State of the Art**, IEC Standards, CIGRE Guidelines, Stockholm Convention on **POPs** (Persistent Organic Pollutants); **Opportunity** for prevention and/or mitigation of **losses and risks** for the **asset, workers, public health and environment**; Focus on hot topics and priorities for strategic electrical equipment filled with insulating fluids; **Diagnosis** (> 150,000 cases) and Integrated Treatments (> 700 Power Transfos -



DMU & Treatments

2012) with DMU (25 Decontamination Mobile Units), guarantee **independent expertise, reliability, quality control (ISO 9001-2008, ACCREDIA ISO 17025), traceability, economic benefits, environmental protection, social, stakeholders and insurance** relationship.