

## PROPOSAL ABSTRACT

### Connection of a transformer to an active distribution network

Proposed theme	2 - Network planning and access options / Analysis tools and techniques for active networks	Date	03-12-2013
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### SUMMARY

With the introduction of a smart grid for the transmission and distribution of electricity, a new paradigm for the operation and maintenance of electrical equipment is required. Distribution and power transformers represent one of the fundamental assets in these infrastructures. In order to be suitable for smart grid applications, at a minimum, the most significant operating parameters have to be constantly monitored. Intelligent information received from a smart grid asset can be used to reduce operations and maintenance costs while increasing reliability and safety.

The way to connect the transformer to an active network is a very relevant topic in this new scenario with new rules for energy management.

Moreover, a large number of the transformers world population is approaching its expected end-of-life thus there is an increase need for better methods to see whether the transformers are still fit for use or need to be retrofitted or replaced.

COMEM has specifically developed a complete solution that enables the installation of smarter monitoring devices provided with analog and digital output (e-Devices) controlled by a central unit (e-Sense) installed on the transformer, exclusively designed in order to empower:

- 1) Continuous monitoring of the main safety parameters like oil level, main tank pressure, gas accumulation and temperature, silicagel status;
- 2) Supervision of transformer cooling fans and pumps;
- 3) Remote control and data storage;
- 4) No need for changes on transformer design.



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The e-Devices are the perfect combination of the conventional electro-mechanical devices plus robust electronic circuit embedded within the same casing.

In fact the trip functions still remain electro-mechanical and the redundancy is guaranteed by the bus communication.

The e-Devices are linked to the central unit e-Sense via bus using a single cable. Then all data are sent to the relevant data center by using the main protocols available on the market like IEC 61850, IEC 60870-5-102, DNP-3.0 and Modbus TCP/IP.

Additionally, this platform can read data coming from third party devices or sensors.

By implementing this solution, the end user will get easily access to all the fundamental information needed to properly operate the transformer in a much more active way oriented to increase the prevention of faulty events which may have a dramatic effect in the newest smart grid concept.

