Delphi Application Note: Delphi Value Proposition

Role of On-Line DGA Monitoring

On-line DGA monitors provide confidence in the condition of power apparatus between regular laboratory DGA samples. The application of such sensors has been common for over twenty years. The value proposition – the business case – depends on avoiding failure related costs in a reliable manner.

Application

The application of Doble Delphi to power transformers helps reduce the in-service failure rate of transformers by providing indication of incipient faults.

Critical Transformers

The transformers considered for monitoring must have at least one of:

- high intrinsic value, such as GSU's or bulk supply points the following
- high impact if they fail – high criticality
- high collateral value – through environmental, fire or safety concerns

Timely Data for Decisions

The data supplied by a monitor must be timely and must address a failure mode which is likely. On-line DGA from Delphi is an excellent approach as it provides a view of the key gases associated with most faults and will respond to give an indication of a wide range of different potential developing faults – PD, arcing, paper ageing.

Reliable Monitors

The Doble Delphi provides accurate data in a context of a sensor which is tested and diagnostically checked on a regular basis to ensure that it is operating correctly. Consequently the Delphi will help reduce the threat of an in-service failure.

Cost Effective & Cost Efficient

The Delphi is cost effective in that it allows for a positive return on investment. The Delphi is cost efficient as it provides a comprehensive monitoring system at a relatively inexpensive level.

Math – Return on Investment

The analysis here is for example only. The values in Table 1 are estimates for an individual unit which will depend on the unit in question. The Doble Asset and Maintenance Management Committee, with the input from several utilities, has a far more extensive spreadsheet analysis.

Subject area	Value
Likelihood of in-service failure	2%
Cost of transformer	$500,000
Cost of clean-up and outage	$1,000,000
Likelihood fault is incipient	50%

Table 1 Estimated Values for ROI Calculation

The annual risk to the transformer is:

2% x ($500,000 + $1,000,000) = $30,000

The risk associated with detectable faults is:

50% x ($30,000) = $15,000

The Delphi monitor – providing reliable and useful data – pays for itself within a year in terms of risk reduction.

Doble Expertise

More than any other company in the world, Doble experts have been dealing with issues in transformers and insulating fluids for over 80 years. Doble is always willing to help our customers with the equipment that we provide and interpretation of data from the DELPHI sensors.

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