



M&D Success Stories

Modern Transformer Fleet Management enabled by GE's Perception™ Fleet

EDF Energy is one of the UK's largest energy companies with a combined generation capacity of over 9 million kilowatts supplying 20% of the UK's electricity, to around 6 million residential and business accounts. It is also the largest producer of low-carbon electricity within the UK, making it a leader within the power generation industry.

EDF's power generation division in the UK has been one of Europe's leading pioneers in terms of the monitoring and diagnostics of their fleet of transformers. Their goals are clear and driven by specific business outcomes, and they have a strategic vision of how to achieve them. Over the years EDF have trusted, relied on and sought guidance from GE to help make their vision a reality. They have invested in GE online DGA monitors as a key enabling component of their strategy. Having this continuous stream of information at their fingertips has helped EDF ensure uninterrupted power delivery by pre-empting and preventing unplanned outages or catastrophic transformer failures and maintaining a healthy network of transformer assets.

EDF have a fleet of over 100 key transformers ranging from 30MVA to 800MVA, of which 61 are being continuously monitored with GE online monitors. To date EDF's significant investment in online monitoring breaks down as 34 Kelman™ TRANSFIX™, 12 Kelman TAPTRANS™, 15 Kelman MULTITRANS™ and 3 Intellix™ MO150's installed on their critical GSUs and auxiliaries. They plan to roll out more online monitoring across the remaining key transformers in the near future. The data gathered by these online monitors is transferred back to the Design Office using fast and robust Ethernet communications as well as to the Central Control Room via Alarm contacts. EDF utilises the information gathered from its online monitors and combines it with years of experience to establish a robust and rigorous transformer fleet management program.

In early 2012, EDF started evaluating GE's Perception asset management software in an effort to help modernise their transformer fleet management program. Perception offered many of the features EDF required, such as client/server capabilities with centralised data, automatic data downloading and data trending, as well as analysis and diagnostics tools. However EDF were keen to work collaboratively with GE to further enhance the features in Perception and develop an application to help them accelerate the return on investment of their online monitoring program and realise cost savings for their business.

Through the collective ideas of EDF electrical engineers, asset managers and GE's product development team, the Wallboard concept was devised and developed. In October 2012 a new version of Perception was released which incorporated the new Wallboard feature, as well as several additional features designed to enhance Perception including: transformer reports, more secure access control, e-mail notification, alarm enhancements, data import/export, more online device support, further diagnostic tools and more. With these enhancements EDF felt they finally had a transformer fleet management application that delivered the information they needed and could use every day.

"Perception helps build a strong case to purchase more online monitors for other transformers"

*- Elaine McCulloch
EDF Electrical Engineer*



Product

Single Gas DGA ☒

Enhanced Monitoring ☒

Multi Gas DGA ☒

Software ☒

Segment

Generation ☒

Distribution ☐

Transmission ☐

Industrial ☐

Over 25 employees in EDF currently rely on Perception to provide up to date and accurate information on transformer asset conditions on a daily basis. The intuitive nature of Perception ensures that the information is easy to access and understand. By utilizing features such as the data tables, trend charts, diagnostics tools and transformer reports combined with up to date data from the online monitors, EDF employees are able to easily evaluate and track the condition of each monitored transformer in the fleet, as well as generate reports on individual transformer assets.

EDF has a large screen in their Design Office that is dedicated to displaying the Perception Wallboard. The Wallboard gives a geospatial graphical overview of the transformer assets being monitored, providing "at a glance" information on the condition of each asset. Should the condition of any of the monitored assets change, the wallboard automatically updates visually notifying the entire design office staff.

When an alarm notification appears on the Wallboard, the next step is for an EDF Electrical Engineer to open Perception on their PC and analyse the dissolved gas data captured for the transformer. Perception provides the tools necessary to trend and analyse the gas levels reported by the online monitor. Once the Electrical Engineer has a clear understanding of the condition of the transformer and possible fault, he then generates a report using the Perception report generation wizard. The report contains all the information required to take concerns to the next level of management in order to explain and justify any actions to be taken. EDF feel confident that the data and information provided by the online monitor and Perception Server along with some 3rd party consultancy, helps them make the right decision should the need arise to intervene in the daily operation of a key transformer.

"We have removed transformers from service that were identified as suspect through Perception, allowing us to carry out planned exchange rather than potential catastrophic failure, which would have larger commercial costs, safety & environmental issues."

- Elaine McCulloch
EDF Electrical Engineer

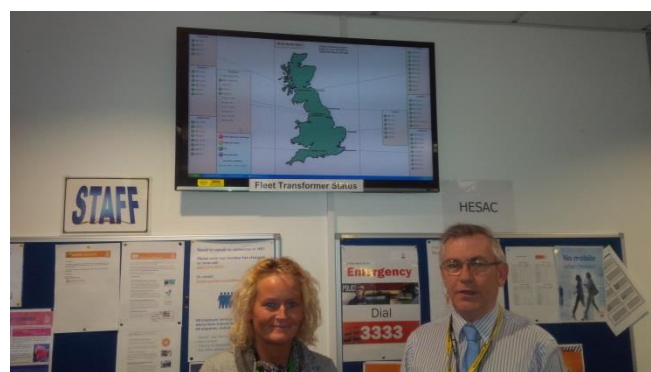
As well as helping with day to day operations, EDF actively uses the information provided by the online monitors and Perception to help them manage and allocate their expenditure. By differentiating their maintenance contracts for "healthy" and "at risk" transformers and determining

which transformers require further forensic examination, EDF has been able to better tailor and more accurately forecast their operating and maintenance expenditure. Being able to identify which assets are at "end of life" and in need of replacement has helped EDF focus their asset replacement strategy and maximise their capital expenditure, pre-empting unplanned outages caused by aging transformers and the associated financial burden and penalties that would ensue.

By analysing and interpreting the information gathered by the online monitors using Perception, EDF has seen and realised a return on investment in their online monitoring program for their transformer fleet. The success of their advanced transformer fleet management program based on online monitoring and Perception, has encouraged them to continue to roll out online monitoring on all key transformers with a view to extending the program to smaller transformers in the fleet in the future.

The next stage in EDF's journey of achieving modern Transformer fleet Management is to upgrade their current legacy Perception Commander software to GE's latest Perception Fleet version. EDF are very excited about this next stage in their journey and are actively pursuing a program to ensure the immediate deployment of Perception Fleet.

Introducing Perception Fleet into EDF's already industry leading transformer management program will further help reduce the time and effort required to identify "at risk" transformers and will provide a constant evaluation of the health of their entire fleet, refreshed as and when new data is received from the online monitors or from offline oil analysis tests. The automatic data analytics, transformer asset evaluations and fleet ranking performed in Perception Fleet will replace part of the manual and resource intensive asset evaluations EDF perform today, saving EDF even more valuable time and money.



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GE imagination at work