

IMPROVING NETWORK RESILIENCE USING VEGETABLE OIL FILLED POWER TRANSFORMERS

A unique facility of the Transformer Innovation Centre (TIC) is the 1 MVA vegetable oil filled power transformer, which provides the opportunity to carry out realistic testing in a controlled environment. One direction of the centre is to assist the partner utilities to using vegetable oils in their transformers. In this project the impact of using vegetable oils in transformers on the resilience of a network is being investigated.



Peak load often occurs on very hot days due to customer air conditioning. If the local load of a substation exceeds its rated capacity a utility might be faced with the decision of transferring load or performing load shedding. The remaining life of transformer paper insulation approximately halves for every increase of 6 °C. For power transformers filled with vegetable oil a suggestion has been that paper insulation ages slower in this fluid compared to traditional mineral oil. However, the thermal properties of vegetable oil differ from mineral oil, resulting in slightly lesser cooling ability.

While an advantage of using vegetable oils in power transformers is that less insulation life might be consumed during an emergency overload, a potential disadvantage is that the transformer might reach a higher temperature at that load. Consequently, to resolve the question on whether vegetable oil filled transformers are able to be operated at high loads for longer than conventional mineral oil filled units, giving the utilities more time to make decisions on when to transfer load, a series of experiments are being performed at TIC. After resolving how vegetable oil filled transformers behave,

during overload conditions, the partner utilities will be able to make strategic decisions on how to overload safely, increasing the resilience of the network.

NEW CPD COURSES ARE ANNOUNCED

Two specialised CPD courses will be held at the Queensland University St Lucia campus Brisbane.

- Transformer HV Bushings - Design, Maintenance and Replacement 12-13 February 2018
- Transformer Tapchangers (OCTC/OLTC) - Design, Maintenance and Retrofit 14-15 February 2018

The courses will deliver theoretical background information with “hands on” practical experiences suited to procurement, asset strategies, operations and maintenance managers and engineers in generation, transmission and distribution, renewables manufacturing mining industrial and infrastructure organisations.

The speakers will include industry experts from:

- Manufacturers of HV bushings and tapchangers including ABB, Reinhausen.
- Transmission and distribution companies.
- Service and testing and companies including Omicron, Doble.
- Researchers from University of Queensland.

The details of the courses will be finalised shortly, then posted on the TIC website (<http://www.itee.uq.edu.au/TIC>) by the first week of December 2017.

Course numbers are limited so please register your interest by emailing: transformer@itee.uq.edu.au



New member, Nynas General Manager Philippe Reboul visiting the TIC with Dr Dan Martin and Dr Hui Ma from UQ.

APPOINTMENT OF CENTRE CPD AND RESEARCH SUPPORT OFFICER

The TIC members are pleased to welcome Ray Holzheimer to the TIC team. Ray’s main focus is to establish the CPD program and research program. Ray has experience in transformer design, manufacture and test and transmission experience in transformer procurement, maintenance and test. Ray will work with the TIC sponsors to deliver value for money and deliver on the strategic objectives of the Centre.

MORE NEW MEMBERS FOR THE CENTRE

Five more companies comprising utilities, transformer manufacturers, component suppliers, test and service companies have recently visited the TIC centre to meet the team and inspect the facilities. Many have expressed interest in becoming sponsors of TIC. A milestone has been reached with the number of sponsors/research partners reaching 20. Achieving this milestone goes a long way toward providing industry funding needed to deliver in the research the member companies need.

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