

TRANSFORMER INNOVATION CENTRE (TIC) UPDATES

Australasian Transformer Innovation Centre (TIC)- Milestones Reached in One Year

In its first year of operation the Australasian Transformer Innovation Centre has already reached its initial target of 20 industry members with a sustainable revenue stream for ongoing delivery of CPD training and applied research to benefit its members.

95% of TIC members have joined as Platinum members signing up for an initial five-year term. The diversity of its industry member base ensures that the centre's focus spans all aspect of the life cycle asset management of power transformers. 35% of TIC members are Australian transmission and distribution companies, another 35% manufacture power transformers and key components with a global market, and the remaining 30% of TIC members are national power industry associations, consultants and international technical publishers.

Interest in TIC membership is growing monthly, with the latest enquiries including interstate transformer asset owners, leading international research organisations, interstate university researchers, and global manufacturers and sub-suppliers of power transformers.

TIC's CPD courses are establishing a reputation across Australia and into South-east Asia, with twenty three industry participants attended the third CPD course on Tap Changers in late June. TIC member's interest and participation in the six existing, industry driven research projects is also growing. The first project nears completion and members eagerly await the confidential TIC members report on how the project outcomes can benefit members. Members are also "lining up" to participate in the first TIC Secondary research project into the Asset Management of Power Transformers in the presence of high penetration of solar PV and Wind power – due to increasing international concerns of high frequency harmonic from inverter connected renewables adversely impacting on power transformers.

Overall, it's been a great first year for TIC and its existing 20 industry members are looking forward to TIC delivering even greater value in the coming year.

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Power Transformer Tap Changers - Design, Maintenance and Retrofit Review

This was the third course of a series being delivered at the Australasian Transformer Innovation Centre. Seven industry and two university presenters delivered the two-day course, helping provide the desired balance, to fulfil a gap in the training market.

The course was divided into areas of Tap changer principles, designs and applications, maintenance, retrofit options, field testing, health assessment via acoustics, and life cycle oriented maintenance-utility experience. In addition, a fault restoration forum was held. Group sharing/case study sessions which were delivered by utility/manufacturers delegates were also facilitated during the course. The aim of this advanced CPD course, was to provide practical training

on topics relevant to procurement /commissioning engineers, maintenance/test staff, and asset management.

Twenty-three delegates attended this course, of which 90% came from generation, transmission and distribution entities across several Australian states.

The majority of delegates said they would recommend this course to others. 100% of delegates rated the course either "Excellent" or "Good".

What delegates said:

- Course materials relevant, knowledge of presenters excellent, more than 80% of topics are directly relevant to me and my team, I would highly recommend this course
- Great technical and experience sharing across utilities, manufacturers, vendors
- Real experience shared by asset owners
- Great tap changer principle explanation
- Excellent course for entry level education on tap changers
- Fantastic frontline material
- Case studies were excellent
- Great open discussions
- 2 days well spent.

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Research Project Update - Development of PD Analytic Tools for Ester Fluid Filled Transformers

Partial Discharge (PD) occurs when there is a partial electrical breakdown in a weak region of a transformer's paper/oil insulation system. PD activities can cause the deterioration of surrounding materials and eventually lead to the total breakdown of transformer's insulation system.

A number of commercial PD measurement equipment are available and equipped with calibration and analysis tools. However, current PD analysis tools have been developed and applied mainly for PD measurements of mineral oil filled transformers. Little is known about their suitability for detecting deteriorating insulation in transformers filled with ester fluid or whether refinements and/or any additional adjustments are required to the application of these tools to PD measurements of ester fluid (e.g. FR3) filled transformers. With the increasing penetration of ester fluid filled transformers and their eventual ageing and associated insulation deterioration, this phenomenon will need to be researched, understood and guidelines developed to support cost-effective life-cycle asset management of ester filled transformers.

This project aims to investigate how to reliably and accurately process and interpret PD signals from an ester fluid transformer. PD measurements will be recorded from experimental PD sources and from ester fluid transformers. By comprehensively analysing the measurement results, the characteristics of different types of PD activities arising from ester fluid filled transformers will be better understood. The appropriateness of current methods for using PD measurements to measure and calibrating insulation deterioration in mineral oil filled transformers will be assessed for ester oil filled transformers. In addition, a new method will be established and trialled for effective extracting PD signals and accurately classifying PD sources inside ester fluid filled transformers.

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Create change

More information on the TIC and membership can be found online at <http://www.itee.uq.edu.au/tic>
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TIC WOULD LIKE TO THANK ITS SUPPORTERS

All the CPD presenters and course contributors and the following companies:

