

Technical Talk an Advanced Diagnostic Methods for Insulation Diagnostic of In-Service Power Transformer

(Jointly organised by

Oil, Gas and Mining Technical Division & Electrical Engineering, Technical Division, IEM)

Date : 27th October 2018 (Saturday)
Time : 9.00am – 11.00am (*Refreshments will be served at 8.30am*)
Venue : C&S and TUS Lecture Room, 2nd Floor, Wisma IEM, Petaling Jaya
Speaker : Ir. Dr. Mohd Aizam bin Talib

SYNOPSIS

The design life of the transformers is usually 20-35 years and practically can be as long as 50 years with appropriate maintenance. Nevertheless, the ageing of insulation system can increase the risk of failure of in-service transformer which can cause interruption of power supply and results to revenue losses to power utilities and also potentially dangerous to utility personnel through explosions and fire. The incipient faults and weakness in the transformer can be detected by effective condition monitoring and diagnostic tools; thus, optimize maintenance and increase reliability of this strategic units. A variety of electrical, mechanical and chemical techniques are currently available and used for testing of power transformers' insulation. Some of the methods have been in use for many years, such as the measurement of insulation resistance, dielectric loss angle, oil quality and Dissolved Gases Analysis (DGA). Over the last 10 years, several advanced diagnostic testing and analytical techniques have been implemented for more clear and focused information on insulation condition of power transformers. Modern electrical testing techniques include dielectric response measurement in time and frequency domain. In such measurement a sinusoidal voltage of variable frequency is used to get the frequency domain spectra of the permittivity, dissipation factor and complex capacitance of the insulation system. In addition to these, the polarization and depolarization current in time domain response is used to supplement the existing insulation assessment techniques. The comprehensive assessment on the presence of incipient faults in power transformer through a well-established Dissolved Gases Analysis (DGA) technique is further improved by an advance acoustic emission diagnostic testing. By measuring the relative time of arrival of the acoustic wave, the location of the faults within the transformer can be determined and located. In addition, the reliability of load tap changer (OLTC) is also important for the safe and critical operation of transformer in electrical network, as 41% of transformer failures according to international statistic were contributed by the OLTC. Presently, many power utilities carried out preventive maintenance on OLTC either based on operating calendar year or number of operations. Others have used off-line and on-line diagnostic techniques to diagnose the condition of load tap changer and initiated maintenance task if abnormal results were observed from the measured results.

This talk will explain the latest advanced diagnostic tool for comprehensive diagnostic and condition assessment of power transformer and share the experience of implementing the assessment of insulation condition.

SPEAKER'S BIODATA

Ir. Dr. Mohd Aizam bin Talib has over 20 years experiences in dealing with transformer diagnostic, condition and life assessment and failure analysis of power transformer. After graduated, he has worked with ABB Transmission and Distribution Sdn Bhd as Design Engineer and in 1998, he has joined TNB Research Sdn Bhd as Research Engineer. He has held several positions with TNB Research as Senior Researcher, Testing Engineer, Assistant Manager and Manager for High Voltage Testing Laboratory. He is currently holding a position as Technical Expert (Transformer) with TNB Research Sdn Bhd. He was previously a member of Malaysia National Working Group TC 42 for High Voltage Testing with SIRIM and currently active member with Malaysian National Committee of CIGRE, WG A2 Power Transformer. He has published and presented technical papers related to transformer diagnostic and condition assessment at national and international journal and conferences.

Ir. Mohd Azwira Mohd Azmi
Chairman
Oil, Gas and Mining Technical Division, IEM

Ir. Chong Chew Fan
Chairman
Electrical Engineering Technical Division, IEM

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**FEE ANNOUNCEMENT
(Effective: 1st October 2017)**

Members:

- (i) Registration Fee: No Charge
- (ii) Administrative Fee:
 - (a) Online RM15
 - (b) Walk-In RM20

Non-Members:

- (i) Registration Fee: RM50
- (ii) Administrative Fee: RM20

- Limited seats are available on a "first come first served" basis (maximum 100 participants).

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