

# **Technical Talk on**

## **Smart Condition Monitoring of Power System Equipment**

**Date:** Thursday, May 03<sup>rd</sup>, 2018

**Time:** 4:00-5:00 pm

**Venue:** **National University of Singapore**  
Seminar Room E4-04-03, Block E4, Faculty of Engineering,  
National University of Singapore.

**Presenter:** **Dr. Charles Su**  
Director of Charling Technology, Australia  
Adjunct Research Associate,  
Department of Electrical and Computer Systems Engineering,  
Monash University, Australia.

***Jointly Organized By:***

**Green Energy Management and Smart Grid Research Center (GEMS),**  
Department of Electrical & Computer Engineering,  
National University of Singapore

and

**IEEE Power & Energy Society, Singapore Chapter and**  
**IEEE PES National University of Singapore Student Branch**

### **ABSTRACT**

During the last three decades, there have been many new developments in condition monitoring (CM). Hundreds of new instruments are used in power industry around the world. Enormous quantities of CM data are collected from on-line and off-line tests every day. Now, it may be the right time to ask “Are we using CM instruments wisely?” In fact, one of the problems often encountered by industry is how to interpret the mass of CM data. Of course, CM program must be accurate, reliable and cost-effective. The cost includes instrumentation and on-going testing and data interpretation.

The common problems experienced by industry are:

- Over-usage of techniques and instruments, making CM costly;
- Misunderstanding of the principles underlying the operation of CM equipment;
- Difficulty in interpreting complex and voluminous data, and therefore in diagnosing incipient faults;
- Difficulty in determining the critical fault levels on which repair/replacement decisions should be based;
- Difficulty in estimating accurately the remaining service lifetime of insulation.

Given the above problems, a new concept of Smart Condition Monitoring (SCM) is proposed to wisely select and apply condition monitoring techniques, i.e.

- Smart selection of CM techniques
- Smart sensor development
- Smart data interpretation and diagnosis
- Smart failure investigation and failure prevention
- Smart sharing

## **BIOGRAPHY:**

Dr. Charles Su was a high voltage engineer in 1970's. In 1990, he obtained PhD from the University of NSW Australia and worked as a lecturer until 1991. Then, he joined Monash University as a lecturer, senior lecturer and associate professor until 2001. In 2002, he took the chief technologist position in SP PowerGrid. From 2007 to 2011, he was a professor and head of research committee at Petroleum Institute, UAE. Then, he worked as a guest professor at North China Power University in 2012 and Wuhan University in 2013. Afterwards, he joined Newcastle University (UK) until Feb 2017 when he retired to Melbourne. He is now the director of Charling Technology, Australia.

## **BOOKS PUBLISHED:**

Dr. Charles Su published two books and over 150 technical papers. He received two awards: 2001 Monash University Vice-Chancellor's Special Commendation for Teaching Excellence\* and 2002 IEEE Standards award. He is a life senior member of IEEE and fellow of IET.

- Book "Condition Assessment of High Voltage Insulation" UK: IET Power & Energy series No.53, 2008 (co-authored with Prof. R. James of UNSW)
- Book "Electromagnetic transients in transformer and rotating machine windings", ISI Global, USA, Aug 2012

<http://www.adm.monash.edu.au/records-rchives/archives/vcawards/distinguishedteaching92-05.html>