

CIGRÉ WORKSHOPS – DESCRIPTIONS

MONDAY OCTOBER Oct 17, 2016

Each workshop will include a question period.

07:45 - 08:00 **WORKSHOP DAY PRESENTATION AND WELCOME ADDRESS** Room ID

08:00 - 09:30 **WORKSHOP #1: Electricity Markets and Regulation** Room ID

Title: Energy Markets: Overview and trends

Chair: Keith Inman

Description:

The objective of this tutorial will be to provide an introduction to basic energy market principles that then leads to an overview of the energy markets, specifically, Congestion Revenue Rights (also called Financial Transmission Rights), Day-Ahead and Real-Time Markets for energy and ancillary services. Real-Time Operations at an ISO where all these market components come together and how an efficient market design is complimentary to serving the operational reliability needs of the grid will be covered.

The tutorial will conclude with a description of emerging trends/challenges (e.g. increased penetration of renewable and storage at the transmission and distribution level) and the way ISOs are addressing them along with new initiatives being considered.

Presenter of this workshop will be Mr. Sainath Moorthy, Principal, Market Design & Development, Electric Reliability Council Of Texas (ERCOT)

9:30am-100:00 **BREAK** Room ID

10:00 - 11:30 **WORKSHOP #2 - Cables** Room ID

Title: Remaining Life Management of Transmission Cable Systems

Chair: Jim Papadoulis

Description

A methodology is presented to estimate Remaining Life of cables, based on technical, economical and strategic criteria. The methodology has two parts: the simplified approach and the detailed approach. The simplified approach separates the cables with a long life from those of which the remaining life is unknown. The detailed approach gives a more detailed answer about the category applicable on the investigated cable system:

The cable system approaches end of life

The cable system needs particular attention

The cable system does not need immediate attention.

A number of Case studies are dealt with to check the methodology with practical situations. Finally life extension programs are discussed and recommendations are given for life extension in practice.

Presenter of this Workshop will be Harry Orton of Orton Consultants International

11:30 - 13:00

LUNCH BREAK

13:00 - 14:30

**WORKSHOP #3: Distribution Systems and Dispersed -
Generation, Protection and Automation**

Room ID

**Title: Transmission Interconnection of Nonutility “Green”
Generators**

Chair: Terry Martinich

Description

The high cost of generation interconnection using conventional methods of building a new transmission circuit or a switching station, impedes viability of nonutility “green” generators which are typically of much smaller size and have lower capacity factor than the traditional utility-owned generators. This tutorial will discuss creative protection solutions to substantially overcome this barrier, thereby facilitating tap-connections of small to mid-sized generation directly to the transmission system. High cost network upgrades are avoided without compromising protection reliability or grid safety. Tap-connections, though economic and commonly applied to interconnect loads, are not traditionally used

for connecting generation because this creates a multi-terminal line, which degrades the line protection's ability to detect short circuits. While the academic research is on-going in this area, the presented solutions use modern off-the-shelf multifunction relays which offer a suite of relaying schemes in a single device. Depending upon system constraints, different schemes can be "mixed and matched" in conjunction with the tele-protection channels to devise the multi-terminal line protection schemes. Examples of these schemes will be presented. Relay records from actual faults will be used to demonstrate the reliability of the schemes applied. Specific protection issues associated with interconnecting the non-conventional resources, such as windfarm or solar systems will also be discussed

Presenter of this Workshop will be Presenter Dr. Mukesh Nagpal, Principal Engineer, Team Lead, Protection Planning at BC Hydro

14:30 - 15:00	BREAK		Room ID
15:00 - 16:30	WORKSHOP #4: ENVIRONMENTAL PERFORMANCE	-	Room ID

Chair: Dr. Jorgé Hollman

Title: Electrical Network: Seismic Reinforcement and System Recovery

Description

Part 1: System Recovery (José R. Martí)

After a large natural disaster such as an earthquake, equipment damage is widespread across multiple critical infrastructures (ICT, electrical, water, transportation, hospitals, etc.). The topic of interdependencies among critical infrastructures (CI) has received considerable attention in the last ten years and a number of approaches have been proposed to represent "domino effects". However, interdependencies among CIs are increasingly complex and include feedback loops that require a full system-of-systems solution. An effective system restoration strategy needs to take into account the interdependencies among CI, the response resources available (telecontrol capabilities, system reconfiguration capabilities, crew personnel available) and prioritize restoration in terms of which CI components are most critical for the population well-being.

This tutorial will present the state-of-the-art on system-of-systems modelling with the objective of detecting system vulnerabilities to prioritize system reinforcement, and to increase system resiliency by optimizing the response and recovery strategies.

Part 2: Seismic Reinforcement (Carlos E. Ventura)

In recent years Structural Health Monitoring (SHM) of Civil Engineering Structures has attracted considerable attention. Significant advances have been made in the theory related to the “health” of structures, and the present engineering applications of SHM are very encouraging and promising. However, the large variety of approaches that have been proposed makes it difficult to compare and contrast the merits of the various methodologies. Complementary to advances in the SHM of structures are the advances in technology related to earthquake early warning (EEW). The incorporation of an EEW system as part of a monitoring project offers interesting alternatives to reduce the detrimental effects of earthquakes on industrial process and human activities.

This presentation will provide a general overview of the various monitoring methodologies that are of practical applicability to Engineering Structures located in seismic regions, and will provide provoking thoughts of what the academic and research community should do to encourage owners and operators of critical infrastructure to monitor and protect their assets.

The first presentation will be led by Dr José R. Martí, University of British Columbia, while the second presentation will be made by Dr. Carlos E. Ventura.