



**CIGRE Canada Annual Meeting**  
**October 4, 2009**  
**Toronto**  
**SC – C2**  
**Power system operation and control**

Presented by : Michel Armstrong



## **Scope**

### **Power System operation and Control**

The scope covers the technical, human resources and institutional aspects conditions for a secure and economic operation of existing power systems under security and regulatory requirements



## **SC C2 Membership**

- Chairman, Michel Armstrong, term. 2010
- Secretary, Ben Li , Canada
- Canadian member, to be named
- The study committee has currently :
  - 24 Regular members
  - 12 Observer members

## Highlights

- 2WG terminated their work and published their report :  
**WG C2.31** “Joint and coordinated development of operators in control centres from different companies and nationalities” and **WG C2.32** “Emergency organisation in control centres for crisis management in system operation”
- 3 New WG were approved:  
**WG C2.33** “Control centre operator requirements, selection, training and certification “ **WG C2.34** “Capabilities and requirements of a control centre in the future; functional and human resources view .  
**WG C2.22** “ Application of Resilience engineering to safety management principles in Control Centre ensuring power system reliability and security”
- C2 participation to JWG C1/C2/C6 “Coping with limits for very high penetrations of renewable energy.
- Publication :  
“System Control in light of recent developments in substation control.”  
dec.2009



- Activities :

Symposium Guilin, China ,“Operation and development of Power Systems in the new context” and workshop “Wind generation issues for investment and system operation” October 2009

Joint IEEE/CIGRE Calgary, July 2009

Workshop Electric Power Control Centres Dublin, June 2009

- Planned WG :

C2.15 Common Information model and its prospective use in power system operation.

C2.21 Lessons learnt from recent emergencies and black out

- 2010 Paris Session:

25 papers selected for the Special Report

PS1 Enhancement of operational reliability

PS2 Consistency and coordination of system control and operation

Organisation of the Large disturbances Workshop



## **Technical direction and future area of work**

- Manage wide area :supervision and control
- Adapt the organisation to the evolution and the changes of Power system control at the Continental, Regional, and Local level
- Increase hability to facilitate and control two way flows and information from generation to consumption
- Impact from new sources of dispersed generation, storage and related requirements
- Self healing network and automated restoration procedures



## Progress of work

**WG C2.11** System control in light of recent developments in substation control , convenor M. Power, Ireland

Substation control systems (SCS) are the first level of control in Transmission System Operation. They are supplanting the RTU and integrating station control and protection. This report discusses recent advances both in IEC standards and substation control systems and how the latter operate in hierarchical control systems. System operation in terms of integrated monitoring, control (especially of wind generators) and protection is also discussed.

**The WG terminated its report in September 2009, to be published in December 2009**



## Progress of work (continue)

**WG C2.13** Voltage and VAR support in System Operation, convenor Rui Pestana Portugal

With increased loading of the power system elements the voltage support problems and in extreme cases possibility of voltage collapse have increased in power systems. There is a need to reconsider the voltage and Var support in the market structure and the coordination needed between TSO, DSO and among TSOs across the boundaries.

**TOR approved in 2007 ,Report expected end of 2009**

**Canadian participant : Sébastien Guillon**

**WG C2.22** Application of resilience engineering to safety management principles in Control Centres, convenor Teresa Carolin, South Africa  
survey to obtain additional information to assist in understanding the current practice of safety management in Control Centres

Investigate what role resilience engineering may play in developing adaptive capacity in control centers, particularly in enhancing the response to accidents or disturbances,

**TOR approved in 2009, Report expected in 2011**



## Progress of work (continue)

**WG C2.33** Control Centre Operator requirements, selection, training and certification, convenor Ninel Cukalevski, Serbia

Electricity sector in many segments have changed, IT-based systems and tools available to operators also changed considerably yielding new challenges and opportunities. The main scope of this WG will be the critical assessment of the existing group results related to control centre (CC) operator selection, training and their update to reflect changes in the requirements and on the methods and tools now available to satisfy these requirements efficiently.

**TOR approved in 2009 ,Report expected in 2011**

**Canadian participant : Brett Alborg**



## Progress of work (continue)

**WG C2.34** Capabilities and requirements of a control centre in the 21st century –Functional and human resources views, convenor Udo Spanel Germany

Requirements for operation and human abilities are subject of control centre functionality design and adequate operator training. Increasingly today operators are highly sophisticated in the use of electronic communication media, e-mail, text messaging, chat rooms etc and consequently their thought process are significantly different than hitherto fore. Systems and functions deployed in the control centre need to take account of this in order to optimise the efficient use of the operator skill set.

**TOR approved in 2009 Report expected in 2011**



Progress of work (continue)

**JWG C2/C5.5** Development and changes in the buiseness of system operators, Convenor Ole Gjerde ,Norway

Organisation of System Control in relation to markets; commodity markets versus system integrity, impact of institutional changes on operation. Effect of Open Trading on Operation and Control.

**Revised TOR approved in 2007 ,report on Interfaces between System operators and Regulators expected in 2010**

**Canadian participant: Ben Li**



## Progress of work (continue)

Proposed TOR be approved

**WG C2.15** Common information model and its prospective use in power system operation, convenor André Maizener, France

The need for exchanging data models among system operators is on the increase. Furthermore the data models from the substation and system control must be coherent and unambiguous. There are requirements to revisit the data engineering procedures used in current system controls.

**WG C2.21** Lessons learnt from recent emergencies and blackouts incidents, convenor to be named

Identify the different type of incidents that have occurred and classify them according to certain criteria. Analyse the part that Control Centres played in the occurrence and limitation of the event Determine what Control Centre capabilities could have assisted in avoiding or minimising the impact of the event



**Thank you**