CIGRE Study Committee B4

PROPOSAL FOR THE CREATION OF A NEW WORKING GROUP[1]

WG N° B4.78	**Name of Convenor:** Kerry B. Walker (CANADA) **E-mail address**: kbwalker@hydro.mb.ca
Strategic Directions #[2]: 1	**Technical Issues #[3]: 3**
The WG applies to distribution networks[4]: No	
Potential Benefit of WG work #[6]: 2	
Title of the Group: Cyber Asset Management for HVDC/FACTS Systems	

Scope, deliverables and proposed time schedule of the Group:

Background:

Control & Protection (C&P) of HVDC and FACTS including the valve electronics are unique since they are complex and responsible for the control of large quantities of power transmission and/or AC system stability. The C&P systems are integrated with the power electronic main circuit equipment and are increasingly reliant on off-the-shelf IT products and IP addressable components. Currently a C&P system could consist of vendor specific devices with proprietary firmware and software, combined with common IT hardware and software as servers, NAS, workstations, routers, etc. Different parts of the C&P system have different expected lifecycles, both from a cyber security and operational lifecycle perspective. The regulatory framework applicable to a HVDC/FACTS C&P system will change during specification, design and operational stages. This approach has raised the following concerns by HVDC/FACTS system owners worldwide:

1. HVDC/FACTS Cyber security vulnerability and impacts of changing regulatory requirements
2. HVDC/FACTS Cyber asset reduced life expectancy and replacement timelines
3. HVDC/FACTS Cyber asset technical resource availability, training requirements and vendor supplied continuous cyber asset security and maintenance programs
4. Specification of responsibilities for a HVDC/FACTS cyber security asset, divided among product vendor, system integrator and asset owner

The goal of this WG is to provide a roadmap to addressing these concerns.

Scope:

1. Gather cyber security best practices and regulatory requirements worldwide and summarize key design considerations. The work of WG D2.40 will be considered and valuable in this regard. Further liaison with SC D2 and SC B5 will be established.

2. Analyze options for addressing cyber security design considerations and formulate guidelines to be used when producing technical specifications for HVDC and FACTS

3. Gather HVDC/FACTS C&P cyber asset obsolescence information and identify key design considerations for replacements, post platform support operability and future system development.

4. Analyze options for addressing HVDC/FACTS C&P cyber asset obsolescence design considerations and formulate lifecycle management and vendor support guidelines to be used when producing technical specifications. These guidelines will also include software

version management and replacement system verification testing requirements.

5. Gather and summarize HVDC/FACTS C&P Cyber technical resource availability, training requirements and vendor supplied continuous cyber asset security programs for operations and maintenance.

6. Outline HVDC/FACTS cyber security responsibilities of owners, vendors and system integrators for the whole lifecycle of a project; starting with specification, design, implementation, commissioning, operation and ending with decommissioning and upgrades of control system.

Deliverables:

X Technical Brochure and Executive summary in Electra

X Electra report

X Tutorial[5]

Time Schedule: start: January 2018 **Final Report**: March 2020

Approval by Technical Committee Chairman:

Date: 20/11/2017

Notes: [1] or Joint Working Group (JWG), [2] See attached Table 2, [3]See attached Table 1, [4] Delete as appropriate, [5] Presentation of the work done by the WG, [6] See attached table 3

Table 1: Technical Issues of the TC project "Network of the Future" (cf. Electra 256 June 2011)

1	Active Distribution Networks resulting in bidirectional flows
2	The application of advanced metering and resulting massive need for exchange of information.
3	The growth in the application of HVDC and power electronics at all voltage levels and its impact on power quality, system control, and system security, and standardisation.
4	The need for the development and massive installation of energy storage systems, and the impact this can have on the power system development and operation.
5	New concepts for system operation and control to take account of active customer interactions and different generation types.
6	New concepts for protection to respond to the developing grid and different characteristics of generation.
7	New concepts in planning to take into account increasing environmental constraints, and new technology solutions for active and reactive power flow control.
8	New tools for system technical performance assessment, because of new Customer, Generator and Network characteristics.
9	Increase of right of way capacity and use of overhead, underground and subsea infrastructure, and its consequence on the technical performance and reliability of the network.
10	An increasing need for keeping Stakeholders aware of the technical and commercial consequences and keeping them engaged during the development of the network of the future.

Table 2: Strategic directions of the TC (ref. Electra 249 April 2010)

1	The electrical power system of the future
2	Making the best use of the existing system
3	Focus on the environment and sustainability
4	Preparation of material readable for non-technical audience

Table 3: Potential benefit of work

1	Commercial, business or economic benefit for industry or the community can be identified as a direct result of this work
2	Existing or future high interest in the work from a wide range of stakeholders
3	Work is likely to contribute to new or revised industry standards or with other long term interest for the Electric Power Industry
4	State-of-the-art or innovative solutions or new technical direction
5	Guide or survey related to existing techniques. Or an update on past work or previous Technical Brochures
6	Work likely to have a safety or environmental benefit