CIGRE Study Committee D2

PROPOSAL FOR THE CREATION OF A NEW WORKING GROUP (1)

WG* N° D2.43	**Name of Convenor : Victor Tan (AU)** **E-mail address**: victor.tan@pscconsulting.com
Technical Issues # (2): 2	**Strategic Directions # (3): 1**
The WG applies to distribution networks (4): Yes	
Title of the Group: Enabling software-defined networking for Electric Power Utilities' telecom applications	

Scope, deliverables and proposed time schedule of the Group :

Background : CIGRE Study Committee D2 has, over the past several years, actively examined the cybersecurity issues facing Electric Power Utilities (EPUs). Lately, Study Committee B5 has also joined this activity for cybersecurity issues within the substation and wide-area network controls and protection systems. Consequently, there are a number of IT and operational subject matter experts to address the security issues. EPUs need to effectively manage security services outsourced to a third party. This need is becoming more urgent because of the strong business case for virtualization using "cloud" technologies. Consideration of Software Defined Network (SDN) is an extension to the growing adoption of virtualization within the EPU in solving new challenges such as distributed energy resources (DER) which benefit from an agile infrastructure and network.

The IEEE P1915.1™ standard specifies security framework, models, analytics, and requirements for Software Defined Networking and Network Function Virtualization (SDN/NFV) and addresses security models, terminology, and analytics, essential components of SDN/NFV environments to ensure confidentiality, integrity and availability. As utility interest in SDN/NFV technologies is growing, it will be very important for utilities to be aware of the cybersecurity implications of using these technologies.

Compared to SDN, the control plane of traditional networking is restrictive, resulting in datacenter environments that are unable to respond effectively to the dynamically changing needs of today's cloud workloads. By enabling network control via software, SDN gives users the ability to configure and reconfigure their networks to match the changing requirements of their workloads, without compromising multi-tenant isolation and performance that would be expected from traditional networking.

Scope : Overall the scope of this working group is to produce a framework of guidelines for an EPU to tailor procurement, deployment, and management of SND/NFV technologies. Specific components include;

1. Processes and requirements in the EPU profiting from flexible SDN
2. Architectural framework in which SDN can be inserted
3. Identify the evolution and the current state of the SDN/NFV technology
4. A global survey of EPU activities related to plans to deploy SDN/NFV technologies. Include use cases for existing deployments.
5. Identify use cases and the current challenges in the EPU that SDN/NFV solve
6. Identify existing open system standards to be included in a guideline.
7. Identify the current SDN/NFV technologies available in the market and assess their

potential for EPU (as well as trends)

8. Identify EPU strategies and use case constraints to operate a secure SDN/NFV deployment.
9. Describe key factors for risk mitigation roll-out schedules and cost abatement options.
10. Issues relating to the repartition of investments, revenues and responsibilities between Virtual Service Provider and the Physical infrastructure provider
11. Address the impact of latency, scalability, vendor lock-in, and maturity of the technology and tools offered by SDN/NFV solution providers that are applicable to EPU telecom environments. (performance issues)
12. Identify conformity testing of SDN/NFV deployments that has been successfully completed.
13. Identify the current development of applications directly related to Power Systems, for example in the areas of Virtual system and the role of SDN in virtual and flexible Grid Management architecture and organization – (e.g. disaster-time control centres at required premises)

Background References:

1. TB 588: WG D2.33 Operation & Maintenance of Telecom Networks and Associated Information Systems in the Electrical Power, July 2014
2. TB 461: WG D2.26 Telecommunication Service Provisioning and Delivery in the Electrical Power Utility, April 2011

Deliverables : The final report will be published as a Technical Brochure with summary in Electra. Tutorial material will be produced as required.

Time Schedule : start : January 2017 **Final report** : 2020

Comments from Chairmen of SCs concerned :

Approval by Technical Council Chairman :

Date : 13/12/2016

(1) Joint Working Group (JWG) - (2) See attached table 1 – (3) See attached table 2
(4) Delete as appropriate

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 within distribution level and to the upstream network.
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 (cf. 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