CIGRE Study Committee B5

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

WG* N° B5.57	**Name of Convenor : Diarmuid McDonnell (IE)** **E-mail address**: diarmuid.mcdonnell@esbi.ie
Technical Issues # (2): 6	**Strategic Directions # (3): 2**
The WG applies to distribution networks (4): No	
Title of the Group: New challenges for frequency protection	

Scope, deliverables and proposed time schedule of the Group :

Background :

Load Shedding Schemes (LSS) are being revisited in the context of past blackouts and diminishing system margins. Major areas of focus are: frequency measurement accuracy, measurement range, scheme response time and maximum load shed (disconnection) time. The implementation of these requirements has tremendous implications on compliance management of legacy schemes, as well as on coordination between old and new schemes that have different accuracy and operating times.

With respect to frequency protection for generation, the frequency protection requirements demanded by system operators and unit owners are not always clear or coherent. Moreover, there is a gap in testing procedures required for assessing compliance of frequency protection devices and schemes. This includes the definition of frequency under dynamic system conditions, frequency measurement accuracy, frequency element response time and total scheme operating time.

Scope :

The scope includes:

1. Perform a survey within utilities and manufacturers of LSS equipment with respect to LSS equipment in operation and technical specification in use.
2. Clarify terminology regarding frequency protection and provide new definitions if necessary.
3. Define various frequency deviation scenarios for LSS application and testing purposes.
4. Describe use cases and frequency protection performance requirements based on the proposed scenarios, including negative tests (where no operation is expected).
5. Overview frequency measurement principles, LSS operating principles, their specifications and application examples. Provide application recommendations for frequency protection.
6. Give guidelines on how frequency protection performance should be specified.
7. Investigate application recommendations for LSS in cases where frequency is not maintained by synchronous generation, such as in networks with large penetration of non-synchronous, especially inverter-based, sources.

Deliverables :

- Technical Brochure
- Summary in Electra
- Tutorial Proposal Forms and Power Point slides

Time Schedule : start: beginning 2016	**Final report** : end of 2018
Comments from Chairmen of SCs concerned:	
Approval by Technical Committee Chairman: M. Waldron **Date** : 12/01/2016	

(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