

CIGRE Study Committee B5

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

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| WG* N° B5.58 | Name of Convenor: Andrei PODSHIVALIN (RU) | |
| Technical Issues # (2): 6, 7, 8 | | Strategic Directions # (3): 1, 2 |
| The WG applies to distribution networks (4): Yes | | |
| Title of the Group: Faster protection and network automation systems: implications and requirements | | |
| <p>Scope, deliverables and proposed time schedule of the Group:</p> <p>Background :</p> <p>In the recent decades the technology of switchgear and substation secondary equipment has changed. Speed of operation and dependability have been improved significantly. On the other hand, the power systems are put to the limits of operation and the demand for faster fault clearance is growing. This requirement can be fulfilled by a faster protection, automation and control (PAC) system and modern switchgear. However experience shows that applications with faster PAC equipment and switchgear do not always benefit from the improved speed of the individual components or may even fail to deliver any improved performance. The reasons for this include uncoordinated operation of different PAC devices as well as lack of coordination with the switchgear. In some cases, instrument transformers also contributed to the performance of the PAC systems. It appears that there is a potential for faster protection, automation and control. It is now possible to revisit the PAC principles in order to improve PAC system total operation time.</p> <p>This Working Group aims at creating guidelines for optimized and coordinated PAC systems with the objective to improve the speed of fault clearing systems. The WG will review available PAC technologies and suggest the best practice for main and backup protection, recommend settings, discuss applications guidelines and identify limitations related to primary network components.</p> <p>Scope:</p> <ol style="list-style-type: none"> 1. Identify drivers for and benefits of faster operation of PAC systems. For each application, give an indication of the associated constraints regarding acquisition, transmission, and process of data. 2. Identify desired characteristics for the components of faster PAC systems. 3. Identify and review existing technologies for faster operation of PAC systems. 4. Identify shortcoming in PAC design as related to speed of operation. 5. Propose samples of effective PAC design. <p>The previous Technical Brochures produced by CIGRÉ will be kept in mind before starting the work of this current working group, especially:</p> <ul style="list-style-type: none"> • TB 466: Engineering Guidelines for IEC 61850 Based Digital SAS • TB 329: Guidelines for specification and evaluation of substation automation systems • TB 326: The introduction of IEC61850 and its impact on protection and automation | | |

within substations

- TB 629: Coordination of Protection and Automation for Future Networks

Deliverables

- The Technical Brochure (TB)
- A 60 words Abstract of the TB
- An Executive Summary of the TB
- Tutorial forms and slides presenting information in the TB

Time Schedule: Start: 1st quarter 2016

Final report: 2019

Comments from Chairmen of SCs concerned:

Approval by Technical Committee Chairman:

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)

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| 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)

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| 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 |