

## CIGRE Study Committee B5 «Protection and Automation»

### PROPOSAL FOR CREATION OF A NEW WORKING GROUP

<b>WG B5.42</b>	<b>Name of Convenor:</b> Massimo PETRINI (IT)
<b>Title of the Group: Experience concerning availability and reliability of DSAS</b>	
<b>Scope, deliverables and proposed time schedule of the Group</b>  <b>Background</b> <p>Digital Substation Automation Systems (DSAS), with some form of communication facility on station or bay level, have already been in service for several decades. Their functions include protection, command, control, supervision, grid and equipment monitoring, autodiagnosis and metering, to varying degrees of capability and complexity.</p> <p>The performance of the DSAS is a vital element for the efficiency of the power system operation.</p> <p>Concerning operation and failure analysis of DSASs, most utilities and vendors have their individual procedure to gather information from the field, analyse this data and initiate specific maintenance or replacement actions on this basis.</p> <p>It is thus timely to consider the experiences of the variety of solutions of DSAS deployed, and give meaningful reference to Users, Manufacturers and Systems Integrators, in order to allow them to specify, design and develop the new systems also in terms of Reliability, Availability, Maintainability, and Performance (RAMP) requirements.</p> <p>Feedback of the experience gained to date has been identified as of major benefit to users, for effective design and life-time management of protection and control systems. The operational experience concerning dependability and reliability of these systems, but also problems related to hard or software of IED, are the base for new developments or improvements.</p> <b>Scope</b> <p>The task of the Working Group is to collect and collate experience feedback for Digital Substation Automation Systems, primarily based on an end-user survey.</p> <p>The Working Group should also take advantage of the survey to establish the actual state of penetration of DSASs versus legacy electromechanical and electronic SASs.</p> <p>The lessons learnt (advantages/problems) from the operating protection and control systems should be focused on availability, reliability and performances, and classified according to different fields, such as specification, design, development, hardware, firmware, software, testing (type, qualification, FAT, SAT and commissioning), operation (local and remote), maintenance (preventive, corrective, upgrading), evolution (upgrading, expansion, renewal, refurbishment), project documentation.</p> <p>The Working Group should also describe, based on the survey, the approach and practice used by different end-users regarding the requirements and the monitoring of availability, dependability, reliability of DSASs (both non IEC 61850 and IEC 61850 based), not only considering the general definitions of these terms, but also the specific interpretation of their meaning given by each entity responding to the survey, in order to establish a coherent overview over existing practice.</p> <p>Users and Manufacturers will also be asked to describe their experience in terms of figures: the Working Group will guarantee the anonymity of the information reported in the Technical Brochure.</p> <p>The Working Group should analyse the responses and the lessons learnt in order to give recommendations applicable to:</p> <ul style="list-style-type: none"><li>• DSAS specification, design, architecture, operation and maintenance;</li><li>• protection and control IEDs design and maintenance;</li><li>• utility organisation concerning DSAS specification, design, operation and maintenance.</li></ul> <p>Recommendations regarding DSAS can be classified as follows:</p> <ul style="list-style-type: none"><li>• general: applicable to all kinds of systems;</li><li>• protocol-depending: to be interpreted and applied in different ways to the various non IEC 61850 based and the IEC 61850 based systems;</li></ul>	

## **CIGRE Study Committee B5 «Protection and Automation»**

### **PROPOSAL FOR CREATION OF A NEW WORKING GROUP**

- IEC 61850 specific: applicable only to IEC 61850 based systems.

#### **Exclusions**

- inter-area systems (WAMS, WAPS);
- electromechanical and electronic (non digital) protection and control systems.

#### **Deliverables**

- Technical Report (Brochure) addressed to Users, Manufacturers and System Integrators, containing recommendations about DSAS specification, design, operation, maintenance and related utility organisation.
- ELECTRA Executive Summary
- Power Point Presentation for Tutorials

**Time Schedule:** start: 2011; Final report: 2014.

**Comments from Chairmen of SCs concerned:**

**Approval by Technical Committee Chairman :** Klaus Fröhlich      **Date :**03/01/2011