

Paris Session 2022



Digital Substation: challenges and opportunities

B5 PS2 Q2.01

What are the challenges in the development of digital substations and how to address the problems caused by the digitalization?

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Digital Substation: challenges and opportunities

Digital substation allows to reduce cost and increase system reliability

The digital technologies applied to substation brings several benefits.



Some of them are:

- Reduction of components and wirings;
- New functionalities;
- Remote Monitoring;
- Remote access to the system for configuration, control and maintenance;
- Reduction of installation and commissioning time;
- Higher safety.

But there are still many issues to be addressed:



**Technological
obsolescence**



**Vendor
dependency**



**Need for
specific skills**



Cybersecurity

Group Discussion Meeting

Digital Substation: challenges and opportunities

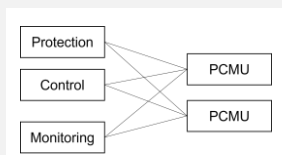
How to address challenges related to digital technology



Technological obsolescence

Hardware obsolescence is caused by:

- Reduction of performance
- Unavailability of spare parts
- Difficulties to update/upgrade to the latest market/operation requirements



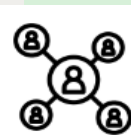
Functional integration and redundancy

How to be addressed?



Virtualization:

- hardware consolidation
- improved portability of the software



Vendor dependency

Digital substations are composed by IED, connected through communication protocols. Proprietary solutions induce technological lock-in effects



Adoption of *international standard*



Interoperability: IED coming from different manufacturers should comply with a detailed datamodel defined by the user

How to be addressed?



Increase of internal know-how:

- development of in-house projects
- staff training
- creation of internal competence centers

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How to address challenges related to digital technology



Need for specific skills

How to be addressed?

Functional integration induces multidisciplinary skills



Specific training of internal staff:

- identify the skill gap
- extend the knowledge



Develop user friendly configuration tools and automatic testing procedures:

- simplify FAT and SAT
- reduce commissioning time
- improve testing quality



Cybersecurity

How to be addressed?

Remote access to the informations introduces new cybersecurity challenges.



Define and apply an efficient and *holistic approach considering all PACS characteristics:*

- Adoption of one-way policies
- Whitelisting
- Patch management
- Hardening
- Firewalling

Thank you for your attention !

Group Discussion Meeting