

## EUR21\_32 – FUTURE OF ELECTRICAL SUBSTATIONS

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**Abstract** - For 40 years, most of the HV/MV & LV electrical substations have been build using copper cables wiring together protection relays, automation and measurement units and primary equipments such Power Transformer, Circuit Breakers, Switches and Voltage/Current Transformers and protection relays to control of the electricity. Beginning of the 21th century, the used of Ethernet based substation communication coupled with the generalization of digital technologies have started the step to digital substations.

The present paper presents the future evolutions for the HV & LV electrical substations based on the new technology evolutions and communication technologies with in detail the new Centralized Protection, Control and Automation Systems for substation supported by IEEE and the expected evolution to the virtualization of all equipments taking benefits of the Merging Units (MU) generalization.

In conclusion, the impacts over substation engineering tools and security concepts are identified coupled with these new HV & LV architectures.