

Study Committee B5 SC B5 – Protection and automation 10676

Integration of Digital Substation IoT sensor data into a digital enterprise

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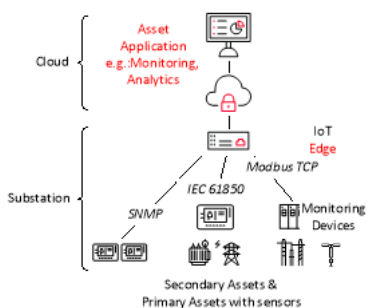
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Motivation

- many new sensors have been installed in the substation to effectively maintain the substation assets
- Challenge to reduce the operational cost and investments
- Need to Extend the lifetime of the assets and to better support the resources maintaining the assets

Objects of investigation

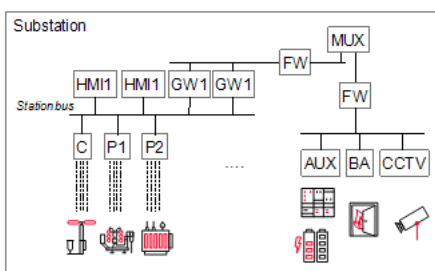
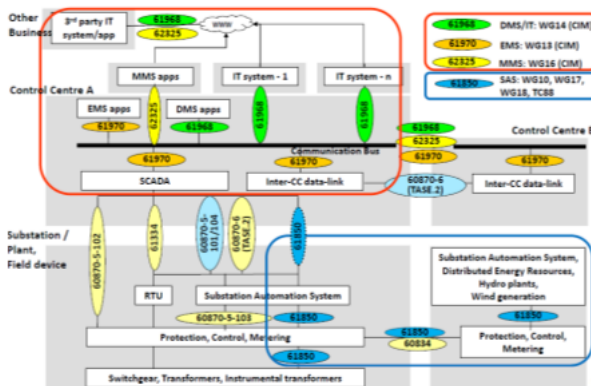
- The challenge, however, is to use that data to improve decision making. What maintenance is needed? What time-based maintenance can be avoided? When should we replace an asset? And last but by far from least important, Do I comply to the latest Cyber Security standards and requirements for my digital assets?
- A holistic solution is needed to support asset owners to better use the collected data from the substation. Digitization and Digitalization as major technology trends to address these challenges provide a unique opportunity to make data actionable



Method/Approach

To maximize the benefits of digital substation concepts it is important to ensure the digitization inside the substation is done in a way that:

- semantic of the information is done at the source of the information
- conversion of data is minimized from the source of information to the application using it
- if conversion is done it can be done automatically without losing the semantic of the information
- Most relevant standards IEC 61850, SNMP, CIM, ISO 55000
- Cyber Security standards and regulations and certification according standards are driving pre-qualification of product, system, service and organization of suppliers. IEC 62443 and ISO 27001 are the most relevant standards to ensure that mission critical infrastructure service provider deliver secure systems to the asset owner.



MUX	Multiplexer
FW	Firewall
HMI	Human Machine Interface
GW	Gateway
C	Control IED
P	Protection IED
AUX	Auxiliary system
BA	Building Automation
CCTV	Closed Circuit Television

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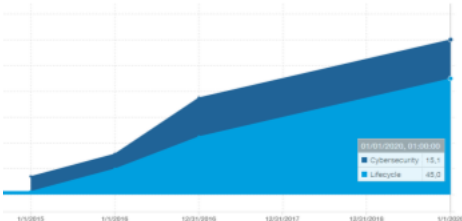
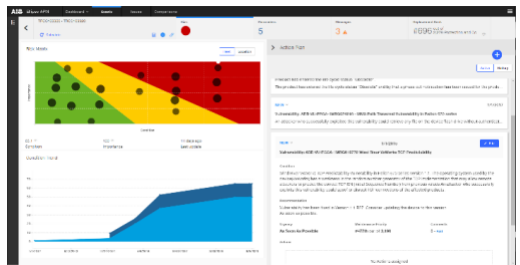
Using new Asset information to manage IED asset health cost-effectively



- Data are collect and
- Connect to expert models and analytics which increase the information set with advanced reports and recommendation on which the maintenance departments can act.
- Workorders are assigned to the workforce and by digital connected platforms the current work is tracked on completion.

Discussion

- risk development of entire fleet, spatial overview of assets, risks distribution per asset types, latest info off asset analytics -> overall visibility of the entire asset fleet health status
- few steps to drill down to the most critical assets and analyze their behavior on Life cycle assessment and Vulnerability assessment



Conclusion

- Many asset owners are realizing that IED assets are becoming an equally important asset to be managed with full support of enterprise asset managements and online connectivity to the installed base.
- Equipment health of these assets need to analyzed not only from cybersecurity but also other aspects with full traceability of condition monitoring and changes happening in the asset lifetime. The amount of IED assets will further increase.
- Connecting the digital information into the utility enterprise business processes does bring benefits to better operate and more effectively maintain the assets in the substation.