

Development Trend of Digital Substation

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

- There is lack of skilled resources in both protection and automation disciplines with regard to IEC61850. Need to develop the resources with the necessary
 - IEC 61850 skills,
 - Operational Technology skills, etc.
- Converting traditional/conventional substations into digital substations
 - Catering for several permutations for both brownfield and greenfield schemes
 - These schemes need to be designed and maintained
- Motivating management to invest into new technology
 - Quantifying benefits of the new technology against old working technology - proper cost analysis
 - Eskom experienced cost savings and reduction in copper cabling by implementing a digital solution in EHV feeders and Breaker-and-a-Half busbar configuration; but
 - Cost saving did not material on smaller power transformers and HV feeders. They were significantly more expensive to implement using digital technology compared with legacy solutions. E.g. the price for transformer schemes with digital technology was double the one with legacy solution.

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

- Commissioning of additional plant on already commissioned digital substation
 - Re-work that results on in-service plant
- Complexity of the networks – the need for proper planning in order to simply design options
 - Suppliers create working solutions that are complex and which are difficult to understand and maintain.
 - Utility need to specify or oversee the creation of communication datasets by suppliers; or to complete this work in-house.
 - Utility tends to stick to overseeing design aspects that we understand based on our previous experience, giving suppliers more free reign in other important areas.
- Cyber security risks – cyber security skills are required.