

Digital substations experience in a distribution utility

SC B5 PS2 Question 1

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

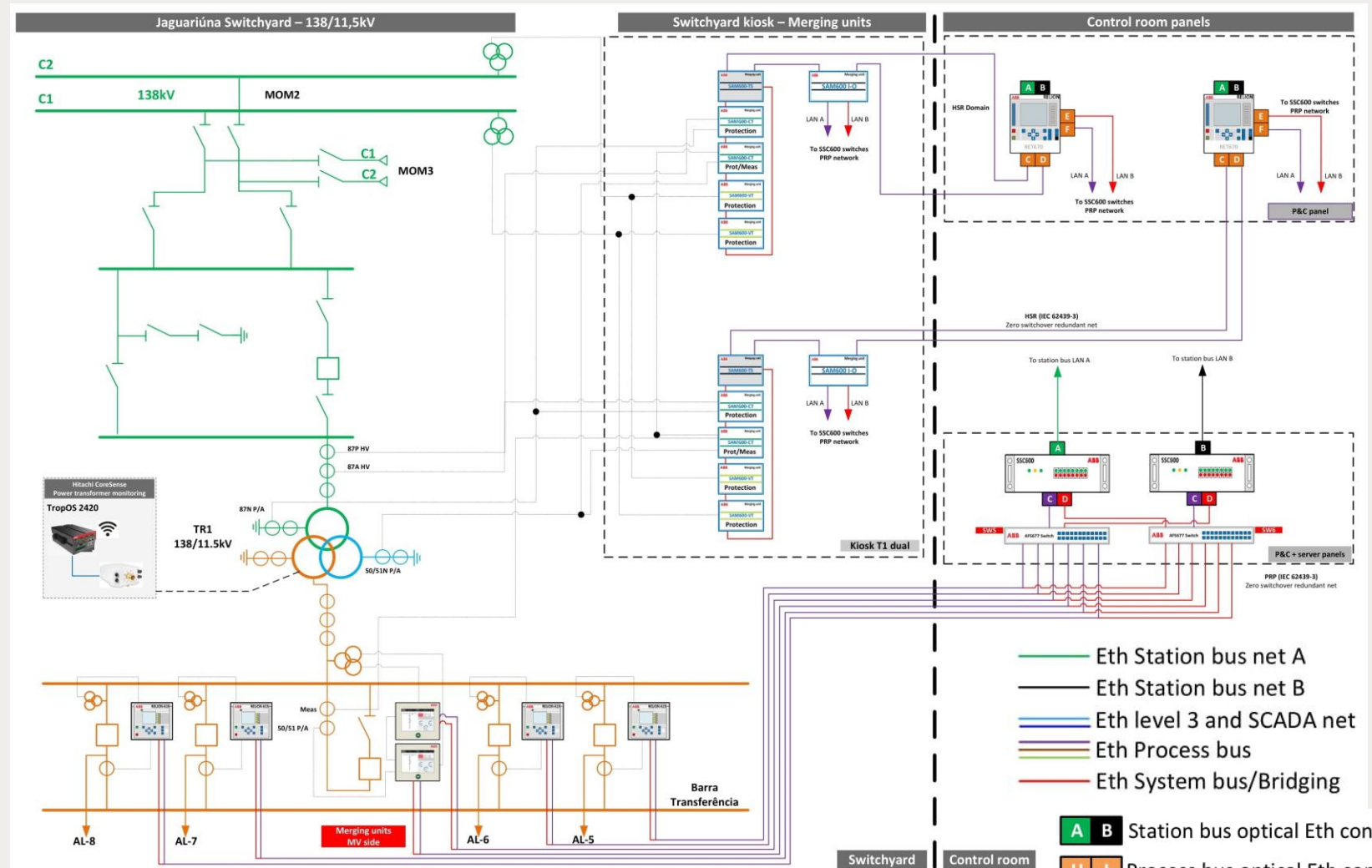
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Jaguariúna 138 kV to 11,5 kV distribution substation

- Pioneer implementation of the full digital concept (Substation 4.0 concept)
- R&D project founded by Brazilian Electric Energy Agency (ANEEL)
- ISA CTEEP joined forces with São Paulo University (USP), LSI Tec and Hitachi
- Centralized protection
- To operate at the end of 2022

Group Discussion Meeting



Jaguariúna 138 kV to 11,5 kV distribution substation

- Reported advantages:
 - Deployment and commissioning cost reductions
 - Facility for asset management and asset monitoring
- Lessons learned
 - Need to use proper tools to access the behaviour of network and IEDs
 - Necessary to consider protection chain performance in the network architecture
 - Need to adopt a maintenance procedure, including spare parts
 - Factory tests are far more relevant and should include all measured quantities in the final implementation in order to detect network congestion.
 - Local SCADA should receive alarms for critical communication network failure conditions.
 - Importance to qualify maintenance and operation teams to deal with malfunctions and to avoid introducing errors that may lead to undesired unavailability.
- Difficulties reported:
 - Lack of qualified personnel to access all the design and implementation phases.
 - Problems with compatibility in the process bus and difficulty in applying cybersecurity measures to the operational network

Group Discussion Meeting