PS3 - Integration of intelligence on substations (Joint PS with B3)

Question 3.04 What are other experiences to improve the specification, engineering, testing and maintenance to address the challenges in our industry?

Application of efficient engineering tools using standardized IEC 61850 defined files and description of functional requirements for specification.

The experience of more than 15 years in the Brazilian market with IEC 61850 (Station Bus) applications and the implementation of the first projects with Process Bus, shows the strategic importance of a good engineering process.

The focus of several companies in Brazil is to ensure an engineering process that uses the resources of the IEC 61850 standard, correctly applying the provided configuration files. This means building the system description starting with the SSD and ending with the substation SCD file in a standardized way and in compliance with the standard. The figure below shows the alternatives of this step-by-step process:
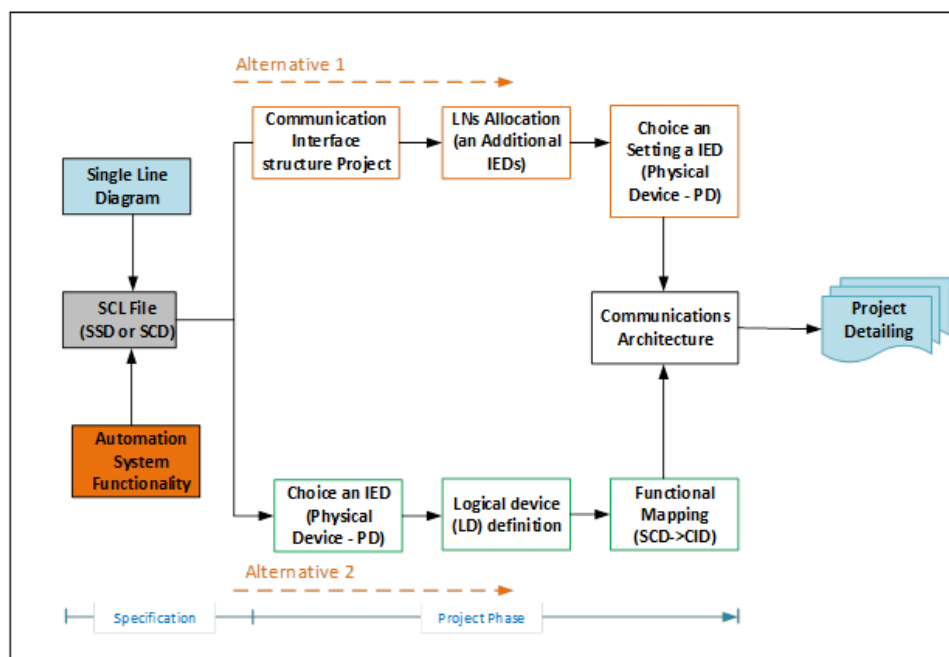
Some challenges in this process:
- Tools for SSD generation in a complete and compatible way
- SSD file compatibility with vendor configuration tools
- Applications in the same installation of IEC 61850 solutions from different editions of the standard
- Inclusion in the SCD file of a complete description of the substation: architecture of the communication network, topology and single-line of the primary system
- Training of teams involved in the process: design, operation and maintenance

- Lack of standards for network design documentation, equivalent to Single Line Diagram ANSI/IEC standards.

In addition, complementary documentation of functional requirements is necessary, which means defining:
- Definition of the communication network (MMS, GOOSE, SV)
- Network requirements (PRP, HSR, RSTP)
- Communication Network monitoring (data and devices)
- Time Synchronization Solution (IRIG, NTP, PTP)
- Certification and Homologation Requirements
- Definition of Cyber Security Solution

Having well-defined requirements and complete and standardized files, the testing tools can be used efficiently, the monitoring of the system for its management will be possible, and in this way the maintenance of the protection, automation and control system - PAC can be done in a an effective and safe way.

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