

B3/B5 Joint PS3

Q3.04 What are other experiences to improve the specifications, engineering, testing and maintenance to address the challenges in our industry?

Test harmonisation and automation (Philippe Goossens – Elia – Belgium)

Elia has launched the SPACS 3 framework agreement 3 years ago (third generation of bay protection systems).

SPACS 3 introduces the IEC61850 Substation Bus and protection test harmonisation and automation.

Gains:

- Suppression of many terminals (marshaling racks) and wiring in the relay house.
- Less hardwired in- and output contacts on bay controller and DCS

Drawback:

- Tools to develop and manage, more complex engineering process
- Combination of hard-wired and IEC61850 I/O's makes testing more complex – need for appropriate testing tools and methods

Elia did not find an adequate testing tool on the market being able to define test sequences with a mix of hardwired and IEC61850 in- and outputs to test functions as the synchrocheck function.

To test the synchrocheck function in the Elia applications (SPACS 3):

- The bay controller needs to receive the closing order via IEC61850 protocol
- If synchrocheck conditions are met, a hardwired contact is closed on the bay controller to energize the closing coil of the circuit breaker
- To validate the synchrocheck 57 test sequences needs to be executed.

Two separate testing tools were needed to perform this test:

- A 1st tool to inject the IEC61850 closing order
- A 2nd tool to check the hardwired feedback

As a consequence, **testing is very heavy and time consuming** and test automation is not possible.

Conclusion

With new technologies it is possible to achieve efficiency, cost and quality gains. **But adequate and user-friendly tools are a must (one unique tool being able to define test sequences with a mix of hardwired and IEC61850 signals).**

The first step has been taken, but we are only at the beginning of a revolution: large-based process bus deployment in the ten next years, further functional integration, increased complexity at system level.

There is a need for a close partnership between TSO's and suppliers of test solutions to anticipate this revolution and be prepared on time.

- The customers should have a clear view on their needs and communicate these needs
 - The suppliers should well understand the precise needs and constrains of the customers and develop the corresponding solutions on-time.
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