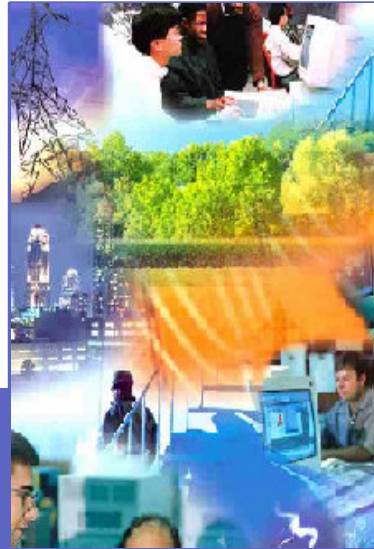




Klaus-Peter Brand

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Specification of IEC 61850 based Systems



IEC 61850
Specification
Ref. scheduled Report of
CIGRE B5 WG11

- Specification behavior**
- Specification basics**
- Specification details**



Behavior of specifying customer

❑ Customers do not define any IEC61850 details

General request for an IEC 61850 conformant system to all addressed suppliers. No additional coordination effort between customer and supplier during the project execution is requested e.g. same amount of meetings as for a SA systems with proprietary communication.

❑ Customers define IEC61850 in detail

This customer requests to get **heavily involved in the IEC 61850 modeling** of the SA system for influencing it according to his intended utility standard. As IEC 61850 is very new for the customer he uses the project also to get more know-how on the IEC61850 standard

❑ Customers specify somewhere in between

This most customers defined something in between based on their **existing known-how about SA** and their **(limited?) knowledge of IEC 61850**



▪ New Installations

New installations allow for **optimized systems** since there are no components left which have to be considered.

Restrictions may be pop up by the conservative attitude of the customer.

▪ Retrofit

A total replacement of an existing installation by a new one in one step has the character of a new installation.

Normally, the **retrofit will performed stepwise** to have a minimum impact on the power supply. This means that old and new parts of the substation automation system **have to be operated in parallel**.

Retrofit has to be handled individually case by case.



□ Functions

For an optimal solution, the specification should be **function-oriented** instead of device-oriented to avoid unnecessary restrictions.

□ Quality

For an optimal system architecture, the specification has to

- contain figures about the **performance** of the functions
- provide figures about the **availability** or **failure scenarios**

□ Responsibility

To guarantee that a system combined of components from different suppliers performs according to the customer specification, the role and responsibility of the **system integrator** has to be specified from the beginning.



❑ Single line diagram

Basis for any Substation Automation System

Defines the Process related Logical Nodes like XCBR, TCTR, etc.

Allows allocation of functions to the process

Contributes to data identification by the plant designation codes

❑ Process interface

Basis for the connection between switchgear and IED

Decisions about the need/request for a conventional wiring or a process bus

❑ Remote interfaces

Refers to gateways to remote operator places or systems like NCC.

Decision about the needed conversion from IEC 61850 to other protocols



❑ Pre-qualified devices

Provides some restrictions. Important is that all such devices have a certified or proven IEC 61850 interface and data model

❑ Pre-defined architectures

Provides severe restrictions if not in line with the common Ethernet structures.

Should be the output of requirements like availability, performance, etc.

❑ Re-use of existing parts

Needs very careful specification and the intended migration strategy.

Has to be handled on single project basis

❑ Functions

To be specified like as before for any SA system

❑ Data model

Mandatory parts are given by the standard. All requested options have to be specified.

There may be some limits regarding the devices available on the market and the state of technology.

❑ Naming convention

All data in the substation have to be identified in an unambiguous way.

Most parts of the LN filed are defined in a mandatory way by the standard.

The LD field has to be used for a hierarchical plant designation scheme, convenient is the use of IEC 61346

❑ Constraints

All geographical and building constraints of the switchyard and the complete site have to be specified as in the past

May have an impact on the communication architecture

