Access to key O&M data by use of IEC 61400-25

PO.203

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Abstract

Availability of online and historical data is a prerequisite for effective operation and maintenance of wind power plants. This is where IEC 61400-25 Wind turbines – Communications for monitoring and control of wind power plants comes in.

The IEC 61400-25 series of international standards provides a solution for access to wind power information with standardized data names and semantics. It provides a uniform communication platform that enables components from various vendors to communicate easily with other subsystems.

Customers and suppliers from more than 10 countries have been involved in the development of the standard. Vattenfall, DONG Energy and Statkraft have been involved from the very beginning.

With the IEC61400-25 series of standards there is now a complete solution to the earlier problems to get easy access to relevant data from turbines from different suppliers!
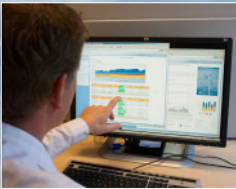
Benefits of IEC 61400-25

➤ Efficient handling and presentation of information from wind power plants.
➤ Minimizes communication barriers caused by proprietary protocols and data.
➤ Access to data without converters or extra communication equipment.
➤ Possibility to use a common supervision system for different wind turbines.
➤ Monitoring and control solutions can be bought as different parts (best-of-breed).
➤ Supports a range of business cases and customer-supplier roles.
➤ A common solution secures availability of products and competence.
➤ Supported by user group USE61400-25.

The above can be summarized as reduced total cost of ownership or cost of energy.

USE61400-25
IEC 61400-25 user group

Mission   www.use61400-25.org
• To support use of the IEC 61400-25 standard series

Vision
• Add value for the users of IEC 61400-25
• Share information of relevance for use of IEC 61400-25
• Share documents of relevance for use of IEC 61400-25
• Discussion forum for resolution of technical issues / data base
• Feedback to IEC 61400-25 maintenance team
• Coordinate activities with related user groups and organizations
• Validate member devices spending the least effort, money and time

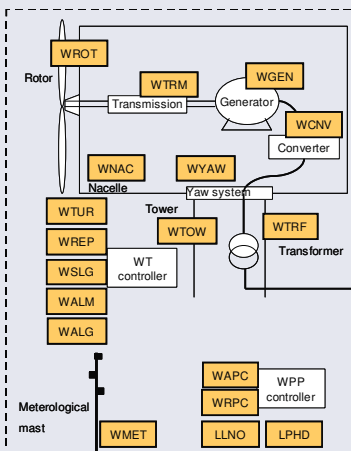*"This means efficient and with expected interoperability".*

Facts about the standard

The IEC 61400-25 series addresses all communication between components such as wind turbines and actors such as SCADA systems and dispatch centres.

The scope covers all components required for wind power plant operation including met.stations, electrical subsystem (in IEC 61850) and plant management system.

IEC 61400-25 defines how to:
• model the information,
• perform information exchange,
• map specific communication protocol stacks, and
• perform conformance testing.

The standard excludes a definition of how and where to implement the communication interface and thereby enables any topology to be applied.

For migration reasons the first step would typically be to implement a standard interface to make data available at wind power plant level, and as a second step implement IEC 61400-25-4 protocols for components inside the power plant.
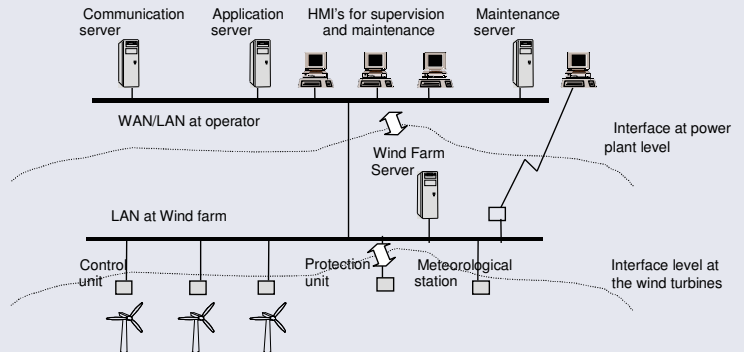

One method is used to model both wind turbines and additional components such as met.stations, alarm/event logs, power control system and CMS.

The wind power specific information in IEC 61400-25-2 is built on data classes specified in the IEC 61850 series of standards.
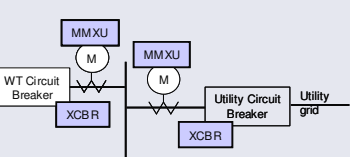
Raw source data from plant components is processed into specified information.

Additional process information: 10 min-avg, alarms, logs, counters, timers,...

IEC 61400-25-4 specifies multiple mappings to communication profiles, where the choice depends on the functionality needed and the location of the interface; A) Webservices, B) IEC 9605 MMS as defined in IEC 61850-8-1, C) OPC/XML-DA, D) IEC 60870-5-104 and E) DNP 3.

Conclusions

The IEC 61400-25 standard series provides access to key O&M data necessary for evaluations and analysis to improve the operation of wind power plants.

The cost for data access and system integration can be decreased both for the customer and for the supplier.

The user group supports users and provides input to the IEC standardization group.

Vattenfall, Statkraft and DONG Energy have all included the IEC 61400-25 series in their requirements specifications. Support for the standard is one of the evaluation criteria for the delivery of new wind power plants.

The fact that IEC 61400-25 has been jointly developed by customers and suppliers from more than 10 countries shows the importance and acceptance of the standard.