

Minutes
TC88 Wind Power Systems, Project Team 25
January 15, 2002 Meeting in Frankfurt, Germany

Minutes taken by Kay Clinard, KC Associates

Date and place

The meeting was held 15th to 17th January 2002 in Frankfurt, Germany. Hosted by VDMA.

Day One, Tuesday January 15, 2002:

The slides presented at the meeting can be found in document 2 - 88PT25(20020115Frankfurt)2R04.

- Meeting called to order by Anders Johnsson (the project leader)
- Welcome of members and guests by Anders
- Agenda was discussed and approved with a request to focus on requirements. (See document 1 - 88PT25(20020115Frankfurt)1R01).
- Attendance list was circulated
- Roll call of experts, with brief overview from each regarding interests. The attendees are listed in the attached file: "Frankfurt Attendance Jan 2002.xls"

- Anders presented the object of the meeting to:
 - Introduce new experts,
 - Discuss project objectives and ensure the scope of the task is understood.
 - Establish the project plan,
 - Reach consensus on the Requirements,
 - Reach consensus on the principle directions for:
 - the information models and modelling method (IMM),
 - the information exchange methods (IEM),
 - the mapping(s) and stacks (MS),
 - Discuss principle directions for conformance testing
 - Structure the work and develop a plan of action

- The protocol of the last meeting was approved

- Anders reviewed the Project Objectives
 - Overall purpose
 - Interoperability - No protocol converters
 - Common data models - No "Data converters"
 - Title: Communications for monitoring and control of wind power plants
 - Scope: This standard defines information, information description methods, and information exchange for monitoring and control systems for wind power plants.
 - A discussion of terms ensued, and the meaning of a "wind power plant". A soft copy of the document was distributed to those present.
 - Document Purpose: This document provides a standard for interconnection of monitoring and control systems for wind power plants. It provides requirements relevant to the specification, engineering, use, testing, diagnosis, and maintenance of the information to be shared in wind power systems.
 - Project goals
 - Standard
 - Non-project goals
 - Market support
 - Pilot projects
 - Products
 - Overall goals

- Walter Sass raised some concerns about the adoption of IEC61850 as all or part of our standard:
 - That concern about interoperability of windfarm SCADA systems with utility SCADA is misplaced – the two types of systems have minimal interchange. 61850 does not fill an industry need in this regard.
 - That 61850-monitored substations have “station power” – are always powered. Windfarms, by contrast, often lose mains power and are not universally battery backed. This affects event-driven communications as included in 61850.
 - That, contrary to belief, bandwidth is not unlimited or free in the windfarm environment, it is widely variable and can be less than 9.6kbps. Object-oriented communications is poorly suited to low-bandwidth applications.

(Walter’s comments initiated some group discussions during the meeting. Notes from these discussions can be found later in this document).
- Anders then reviewed the Project Plan
 - Organisation
 - Milestones
 - The procedure for development of an IEC Standard, Deadlines
 - Deliverables
 - Basic rules for the structure and drafting of an IEC Publication
 - Relationship to other projects and to existing publications
 - Activities
 - Resources
 - Co-ordination
 - Schedule
 - Budget (No central IEC funding)
 - SWOT (Strengths, Weaknesses, Opportunities, Threats)
- Decision to set up an e-mail exploder for discussions between the meetings. Anders shall send list of project members to Susan Giordano who offered to take care of the arrangements.
- The group discussed where to hold next meeting...potential to meet either in Oslo on April 9 -11, or perhaps in Paris during the 2002 Global Windpower that meets during April 2-5, 2002.
- Group discussion of the major differences between Windpower requirements and substation requirements...the concept of station power and the concept of network.
 - Station power is an absolute requirement...every piece of equipment is powered all of the time. It is not acceptable to be able to talk when something goes away.
 - Protocol conversion is a way/fact of life...the idea that you can't talk in case of a power failure is not acceptable. The network that connects the equipment also may not be stable.
- Group discussion of draft document: Looking at the draft of a central wind farm...multi drop networks are not covered, also distributed networks are not covered.
 - Networks are nearly all master slave...this experience is the same all over.
 - We need discussions of requirements without mention of any communication solution.
 - In Germany some think the master slave will trend to peer to peer.
 - Italy deploying turbines sensibly Short networks and microwave networks...ok with standard microwave multiplexers.
 - TCP/IP not necessarily a solution, or part of solution that is desired, due to space between wind farms

- Discussion of networking and stack issues...UCA...HDLC/ADLC, radio links...may end up having multiple solutions at the lower layers...what is needed? RS232/488?
- Voice/security communications...the standard should provide such solutions.
- Anders noted that Vattenfall has turbines from 9 vendors, each with a unique software solution...

Lunch

- After lunch the discussion started with the question ...Is there specific text that needs to be added, do we need to change direction...how do we resolve this issue?
 - Illustrations in 5-3 to 5-4 would help if clarified.
 - Perhaps reuse data modeling techniques from 61850?
 - Windfarm operating system might be a pc or collection thereof that polls windturbines, and turbine mfg wants completely different software.
 - Need to clarify the difference between boundaries and scope...what is the real intention of the draft?
 - Clarify the mandatory requirements, and scope for the project and document.
 - In the final stage the document should be usable, with the ability to give it to anyone.
 - Relationship between scope and draft...are often hard to identify...ie three scope areas and how they are handled. Needs to be a little bit more straight forward using of words to keep the terms tied to the document. Same as with wind power plant and device. Consistency needs to be checked.
 - Same words used for different things...this is resulting in confusing. Needs to be crisper.
 - A sketch is needed for scope...to help clarify issues.
 - Methods not described completely in the document, since they are handled in 61850...should sections be copied, or referenced...
 - First, normally we need a really small abstract model, and then closer to the details.
 - More of building on prior chapters...logical structure of document. If structure is wrong, then we struggle with what we are about. Content may be ok, but the logical structure of the documents are wrong, because we still have new questions each time.
 - Information means
 - Description methods
 - Clarify, clarify, and clarify
 - Content versus structure
 - Parts 5-8 come from functional requirements document.
 - Standards should be response to requirements as we see them in the group.
 - After a lengthy discussion the understanding regarding intention is much better, however this understanding needs to be transferred to document.
 - The content will be the right one, perhaps only the structure is necessary to reorganize.
 - Chapter 7...functional requirements....
 - Nothing about physical network, manufacturer specifics.
 - Move part 6,7,8 to informative annex. Move 9-10 to after scope.
 - DRAFT document...what needs to be changed?
 - Security could be inside the information exchange...
 - What other protocols/media need to be added?
 - Add mapping to protocols to our document. Try to make a few points after scope on mapping.

- New Scope?

Scope: This standard defines information, information description methods, information exchange, and communication protocol mappings for monitoring and control systems for wind power plants.

Include only what will be stable...perhaps for 3 years.

Conclusion was to not change scope, but change explanation following scope to include "selection of protocol profiles and definition of specific communication protocol mappings."

Day Two, Tuesday January 16, 2002:

- Anders opened the meeting with the recommendation that 61850 and scope be forbidden topics for today so that the group might focus on requirements of wind power.
- Section 5.2...wind power components...page 15
 - As a minimum, change wind generator to wind turbine...for all occurrences
 - Change to components of a wind turbine generating system...
 - Separate sections for wind power plants and wind turbines...
 - Section 5-2 xxx includes but is not limited to...note that a fairly detailed sketch of the required components for wind power plants were drawn on a chart, and are included with the minutes as a file: "Windpower Requirements Overview.xls"
- Enron presentation, see picture and slide presentation
- Kay led the group in a hands on modeling exercise. A collection of pictures and documents that document this modeling effort are included in the attached zip file:
 - Beacon.jpg
 - Beacon2.jpg
 - Blades.jpg
 - Gearbox.jpg
 - Metstation.jpg
 - Metstation2.jpg
 - Proposed Wind Building Blocks.xls
 - Windpower basic modeling
 - Windpower requirements overview – small chart printout option
 - Substation Labeling – Dan Co
 - Yaw system definition
- Action on Gordon Smith to check definitions on 3-dimensional wind measurements.

Day Three, Wednesday January 17, 2002:

- Noted that data transfer may be either peer to peer or master-slave
- Extended discussion...solutions are scalable....
- Clarify text regarding optionality of requirements in part 8.2 & 8.3
- Some parts of the document that are informative for the standard should be moved to annexes.
- Overview of requirements diagram should be included in part 5.
- Change verbiage to read that modeling elements for modeling all of the components are included in the standard, along with the methodology for extending the models for specializations.
- The project members shall produce and distribute lists of wind power plant data (including short descriptions) before the next meeting. Kay will join these lists together.

- Resolution to use portions of IEC 61850 Parts 7-2 (abstract communication services), 7-3 (common data classes), and 7-4 (specific pertinent LNs and DOs) that are required by Wind Power. Additional LNs (building blocks) and CDCs (common data classes) will be developed by this team following the same modeling techniques.
- Note that the selection of specific protocols are not part of this resolution and will be addressed after the requirements and data models are complete. This may require mapping sections to be added in our document based on the final protocol selection.
- Additional data exchange blocks will be taken into account for any required data exchange with Energy Control Centers, power exchange centers and other outside clients critical to Wind Power.
- After much discussion, it was noted that mappings will be required for any protocols required by wind power. IEC 61850 part 8.1, IEC 60870-5-(parts 101 & 104), MODBUS, and OPC etc. will be considered by the task group addressing these issues.
- Project members proposing a specific mapping are requested to present a proposal on how this should be done. Knud Johanssen will present a proposal on mappings on OPC. Harald Hilde (not present at the meeting) has proposed a mapping to IEC 60870-5-104).
- Anders will organize task groups that will work with specific parts of the document.
- The discussion on principle directions for conformance testing (VI) was postponed to the next plenary meeting.
- The next meeting will be scheduled for the second week in April in Oslo. There is also a meeting in Glasgow scheduled the second week in June.