Standardisation

EWEA 2011 Reliawind side event
15 March 2011

Peter Tavner,
Durham University
Standardisation

- What Wind Industry standards are relevant for Reliability
- Who in ReliaWind is involved in standardisation
- What standardisation is needed
- What has been done
- Standardisation in other industries
- The standardisation Deliverable
- Next steps
IEC 61400 Standards

- Part 1: Design requirements for onshore wind turbines
- Part 3: Design requirements for offshore wind turbines
- Part 4: Design requirements for wind turbine gearboxes
- Part 5: Rotor blades
- Part 12: Wind farm power performance testing
- Part 21: Measurement and assessment of power quality characteristics of grid connected wind turbines
- Part 24: Lightning protection
- Part 25 (1-6): Communications for monitoring and control - Overall description of principles and models
- Part 26 (Not published): Time based availability for wind turbines
- Part 27 (Not published): Simulation models of wind turbines
- EN50308 Personal Safety
IEC 61400 Standards

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# Who from ReliaWind is involved in Standardisation

<table>
<thead>
<tr>
<th>Summary of IEC Contacts</th>
<th>Main Parts Associated with Reliability &amp; Availability</th>
<th>Other parts (including IEC61400 Part 5, 12, 21, 24, 25, 27, EN50308)</th>
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<tbody>
<tr>
<td>GAMESA</td>
<td>Part 1: Enrique Gomez de las Heras, Millan Esteban Cornejo</td>
<td>Part 5: Alejandro Saez Moreno, Millan Esteban Cornejo</td>
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<td>Part 4: Millan Esteban Cornejo</td>
<td>Part 21: Lars Bo Hansen, Paul Gardner, Gordon Smith</td>
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<td>Part 26: Millan Esteban Cornejo, Eugenio Gomez</td>
<td>Part 24: Slavomir Seman, Jouko Nurinen, Par Malmberg</td>
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<tr>
<td>ALSTOM</td>
<td>Wim Meeusen</td>
<td>LM: Lars Bo Hansen, Paul Gardner, Gordon Smith</td>
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<tr>
<td>HANSEN</td>
<td>Steve Gilkes, Daniel Doncaster</td>
<td>ABB: Slavomir Seman, Jouko Nurinen</td>
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<tr>
<td>GH</td>
<td>Tim Camp, Dave Quarton</td>
<td>SKF: Unsure which Part, Par Malmberg</td>
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<td>Other contacts included in IEC61400 Part 5, 12, 21, 24, 25, 27, EN50308</td>
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EC Contract number 212 966 - FP7-ENERGY-2007-1-RTD
What standardisation is needed

- Taxonomy or Structure of the wind turbine and wind farm
- Structure of the Control & Communications Input/Output List and its relation to the Taxonomy
- Collection of reliability data
- Method of reporting maintenance and in particular:
  - Fault terminology;
  - Fault recording;
  - Fault location.
- Time & energy definitions of Availability for wind turbines and wind farms
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- Time & energy definitions of Availability for wind turbines and wind farms
What has been done

- ReliaWind members have participated in discussion and survey
- Knowledge from ReliaWind, particularly WP1 & 2 has been used to define a standard
- A taxonomy has been agreed
- Standards from other industries have been located
- A recommendation from ReliaWind has been drawn up
Standardisation in other industries

- OREDA, *Offshore Reliability Data*
- EEMUA 191:1999, Alarm systems, a guide to design, management and procurementISBN 0 85931076 0
- NSWC-06A, Handbook of Reliability Prediction Procedures For Mechanical Equipment, 2006, CDNSWC.
Deliverable

ReliaWind

Reliability focused research on optimizing Wind Energy systems design, operation and maintenance: Tools, proof of concepts, guidelines & methodologies for a new generation

Collaborative Project : Large Scale Integrated Project
FP7-ENERGY-2007-1-RTD

Deliverable D 6.7 – Report

Recommendations from the ReliaWind Consortium for the Standardisation for the Wind Industry of Wind Turbine Reliability Taxonomy, Terminology and Data Collection

Workpackage WP 6 – Dissemination
Task T.6.4 – Development of a Wind Energy Reliability Workshop

Month of delivery: M36

Deliverable leader: UDUR
Next Steps

- ReliaWind members on Standards Committees recommend the ReliaWind Deliverable to their National IEC Committees
- Wind Industry members of IEC 61400 Standards Committees adopt those recommendations
- Manufacturers and Operators push for this standardisation
Thank You

Useful Documents.

- Website: [http://www.reliawind.eu/](http://www.reliawind.eu/)
- Monograph of published papers available from website
- Deliverables in the Public Domain include:
  - ReliaWind D.1.1 Literature Review
  - ReliaWind D.1.2 Reliability Profiles Methods
  - ReliaWind D.1.3 Reliability Profiles Results
  - ReliaWind D.2.0.1 Common Reliability Analysis Methods & Procedures
  - ReliaWind D.2.0.2 Functional Block Diagrams & Specifications
  - ReliaWind D.2.0.4 Whole System Reliability Model, Summary
  - ReliaWind D.6.7 Recommendations for Standardisation