

TC88 Blade Maintenance Concept for NP



Kyle K. Wetzel, Ph.D.
USTAG TA

U.S Standards Summit
March 2-3, 2021

WETZEL WIND

Need for Blade O&M Standard

- Blade O&M is the top expense for most owners/operators and the cause of a significant fraction of down time
- Inconsistent Repair Quality
 - Inspections & Repairs are Presently Performed by Service Providers of Varying Qualification
 - Many (most?) repairs are not fully engineered or validated
 - Repairs are failing
- No consistency in categorization of damage with respect to safety of continued operation or urgency of repair
- No requirements for reporting by OEMs of known serial issues
- Need exists for internationally recognized standards
 - Multiple organizations creating proprietary and inconsistent guidelines
 - Build off existing work by others

Proposed Project Scope

- Ensure the engineering integrity of after-market repairs and modifications performed on wind turbine blades
 - Structural
 - Performance
- Ensure an appropriate level of operational safety throughout the design lifetime (borrowed from -5)
- Ensure economical operation of wind turbine blades throughout the design lifetime
- Potential uses:
 - Technical reference
 - Certification

Proposed Project Scope

- Requirements for:
 - Training and certification of blade maintenance personnel
 - Safety practices for blade maintenance
 - Blade Inspections and health monitoring, including external visual, internal visual, and various types of NDT
 - Categorization of damage with respect to safety of continuing operation and urgency of repair
 - Engineering assessment and validation of repair and modification design
 - Materials and equipment used in blade maintenance, including selection, storage, and use
 - Performance of repairs, including QA/QC
 - Monitoring of repairs

Proposed Project Scope

- Possible Requirements for
 - Recommended (or required) O&M Plan to be Defined by OEM as part of design certification
 - OEMs with respect to known serial issues
 - Reporting to end users of known issues
 - RCAs on known issues
 - Recommended remediation strategies for known issues
 - Extended coverage for design or manufacturing defects
 - To be considered as part of expanded scope of 501 to certify blades on the basis of life cycle considerations
 - May or may not belong in a blade O&M standard

Status/Timeline

- Propose CD within 18 months of Start
- Define Scope to be Achieved within 18 months
- Need for a good but timely Edition 1 is more important than the need for a broad Edition 1 at the expense of time
- Could be published as a Technical Specification rather than a Standard if this helps on the timeline with an on-going longer effort to create a Standard

Proposed Participation

- End Users
 - Owners/Operators
 - Service Providers
 - Training Organizations
- OEMs
- Certification Agencies
- Test Facilities

WETZEL WIND

Action needed from TC 88

- Next Stage: TC88 Welcome an NP?
- Feedback on Key Issues:
 - Schedule
 - Should Scope Include the “Possible” Items that relate to up-front design certification and on-going obligations on OEMs
 - Or handle through IECRE
- Encouraging End User Participation

The background of the slide features a series of thin, light blue lines that flow and wave across the frame, creating a sense of movement and depth. These lines are more concentrated in the center and fade out towards the edges.

Thank you!

Kyle K. Wetzel, Ph.D.
USTAG TA

U.S Standards Summit
March 2-3, 2021

WETZEL WIND