

PRECONSTRUCTIVE LIFE ANALYSIS

INTRODUCTION

The **Preconstructive Life Analysis** evaluates how the specific site conditions will affect the life of the assets which remain in pre-EPC Phase.

CONCEPT

When a wind farm is in Preconstructive Phase and the WTG models proposed by the OEMs are being evaluated by the Developer of the project, the Preconstructive Life Analysis evaluates the long term risks by:

- Determining Life Expectancy with its associated uncertainty (i.e. Failure Rate with time) for all structural components on the turbine (i.e. from blade tip to tower foundation),
- Identifying which selective retrofits are required to be addressed for a Life Extension Plan above 20 years (e.g. 25, 30, 35 or 40 years)
- Proposing recommendations for Maintenance Protocol Adaptation associated to such Life Expectancy Analysis for the components, anticipating and preventing premature failures, guiding in-house maintenance adaptation, optimizing O&M contracts and guiding end-of-warranty inspections
- Facilitating a long-term project finance scheme (when required), with longer debt return periods, leading to more comfortable cash-flows.

When different turbines are assessed for same wind farm conditions (e.g. evaluating different candidates before purchasing) a full comparative analysis is provided in order to identify and select the optimal turbine for the site-specific conditions.

METHODOLOGY

The process for the **Preconstructive Life Analysis** and its details are protected by a WO PCT “International Patent” by nabla wind hub **PCT/ES2013/070537 (WO2015/011301)**, and follows the same methodology of the **P80 Exploratory Life Analysis** as a simplification of the **P90 Full Life Analysis**.

In this case, as the wind farm is not built, SCADA Data processing is not applicable, so educated hypotheses based on similar turbines in similar site conditions are assumed to represent the realistic operation conditions.

Extreme loads and **Tip to Tower closest approach** are also analyzed.

OUTCOMES

Nabla delivers the **P80 Preconstructive Life Analysis Technical Report** of the wind farm per configuration with the Life Results (Time-to-Failure) of the turbine components per turbine with the identification of selective retrofits necessary to achieve different Life Extension Scenarios. Inputs, processes and results are detailed.

REFERENCES

nabla wind hub is an independent technology platform that delivers asset redevelopment projects for the wind industry worldwide. End-to-end & one-stop-shop partner for SPVs and Portfolios revaluation, through Life Extension, Performance Improvement and Maintenance Optimisation; based on state of the art technologies, such as top-accuracy aeroelastic models, in-house rerotoring components, and advanced monitoring solutions.



600 wind farms assessed



1200 sensors installed



2000 blades installed



+250 Wind Turbines monitored

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