

Development of an innovative Validation, Testing and Certification Strategy for a 15+MW Offshore WEC

Making the turbine reliable while contributing to lower LCoE

Within ReaLCoE, in the Work Package 3: “Prototype testing, validation and certification” a systematic validation and certification strategy for a 15+ MW offshore WEC was newly developed that is based on requirements from possible failure mechanisms. It adapts quickly to modifications of an existing platform and to different markets and site conditions. The focus is on modular testing and supporting faster time-to-market while ensuring low costs validation. The comprehensive strategy supports lower LCoE by its contribution to higher reliability and availability of the turbines.

2. Evaluation and Decision

The evaluation and decision phase starts after the initialization. Therefore the feasibility of the actions, the availability of test rigs, the costs, the time needed for the activity as well as the risk level addressed need to be considered for each identified risk and its proposed mitigation and validation activity. Synergies can be identified, future turbine variants considered. Profound decisions can be made on which tests will be performed. This strategy leads to a more reliable turbine with high availability while keeping the budget for the validation efforts predictable.

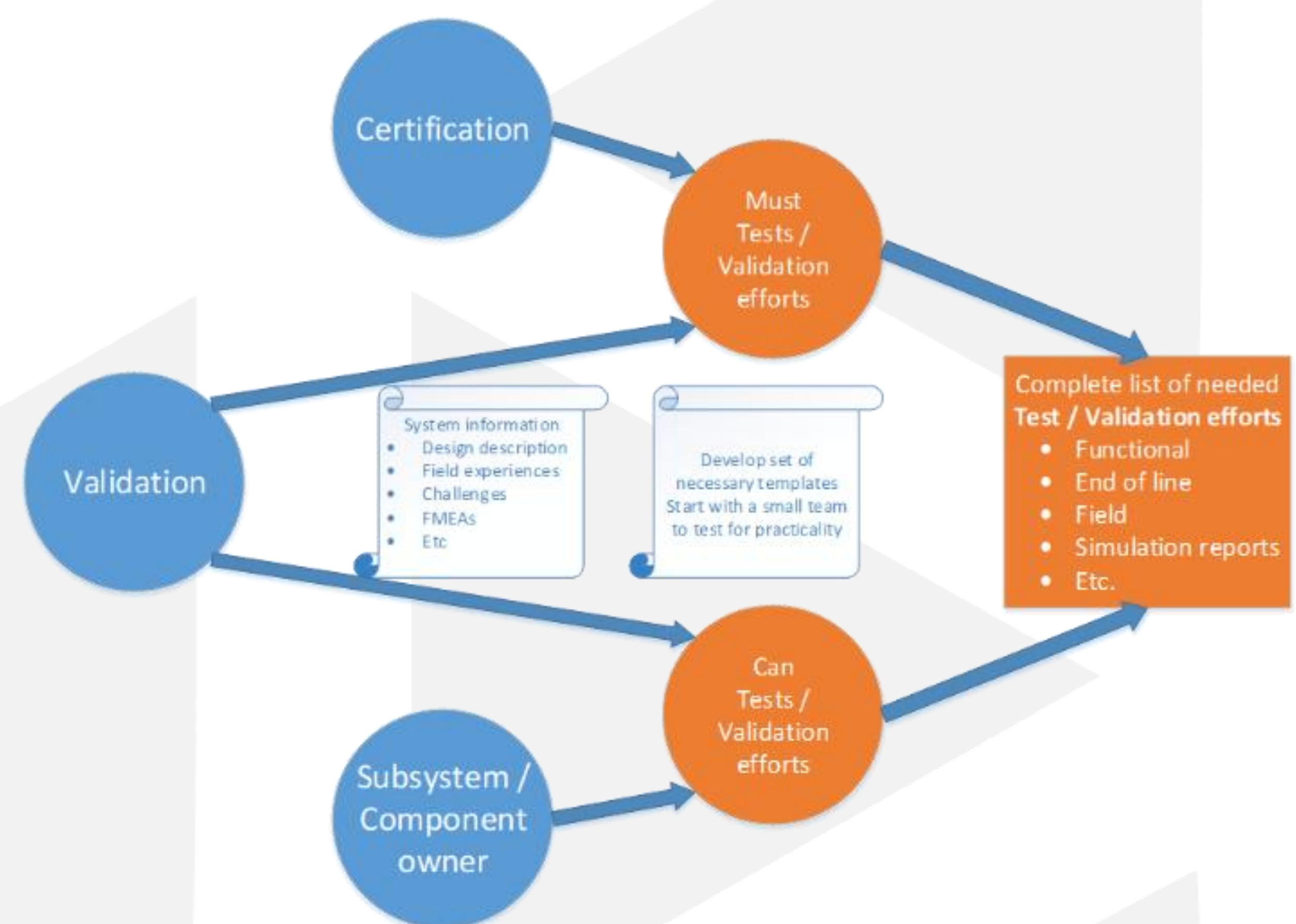
The strategy consist of 4 phases



1. Initialization

The initialization starts with FMEAs and risk assessments for all components and subsystems analyzing and rating the possible failure mechanisms. Subsequently a list of tests and validation efforts is developed including the mandatory tests for certification as well as additional tests recommended to further mitigate failure risks. By the end of the initialization phase, a complete and quantifiable list of validation needs based on the potential risks is defined including estimations on the needed budget, timing and technical feasibility.

Initialization phase of the validation strategy



3. Detailing

In the detailing phase, the test specifications for the validation and certification activities are elaborated.

4. Implementation

The execution of the defined tasks is then part of the implementation phase.

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