



Wind Power

ADVANCED CONDITION BASED MONITORING OF POWER-SUPPLY STRUCTURES

by

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1) To avoid catastrophic failure

2) To avoid reactive and cost-intensive Maintenance





Methodology

Condition based maintenance supplies information about the condition of a plant component to the operator in time!

Thus damage is prevented in time!

The basis of the herein specified type of condition based maintenance is the detailed knowledge about the **damage mechanisms** like

- Fatigue
- Plastic deformation
- Wear
- Corrosion



Research Work

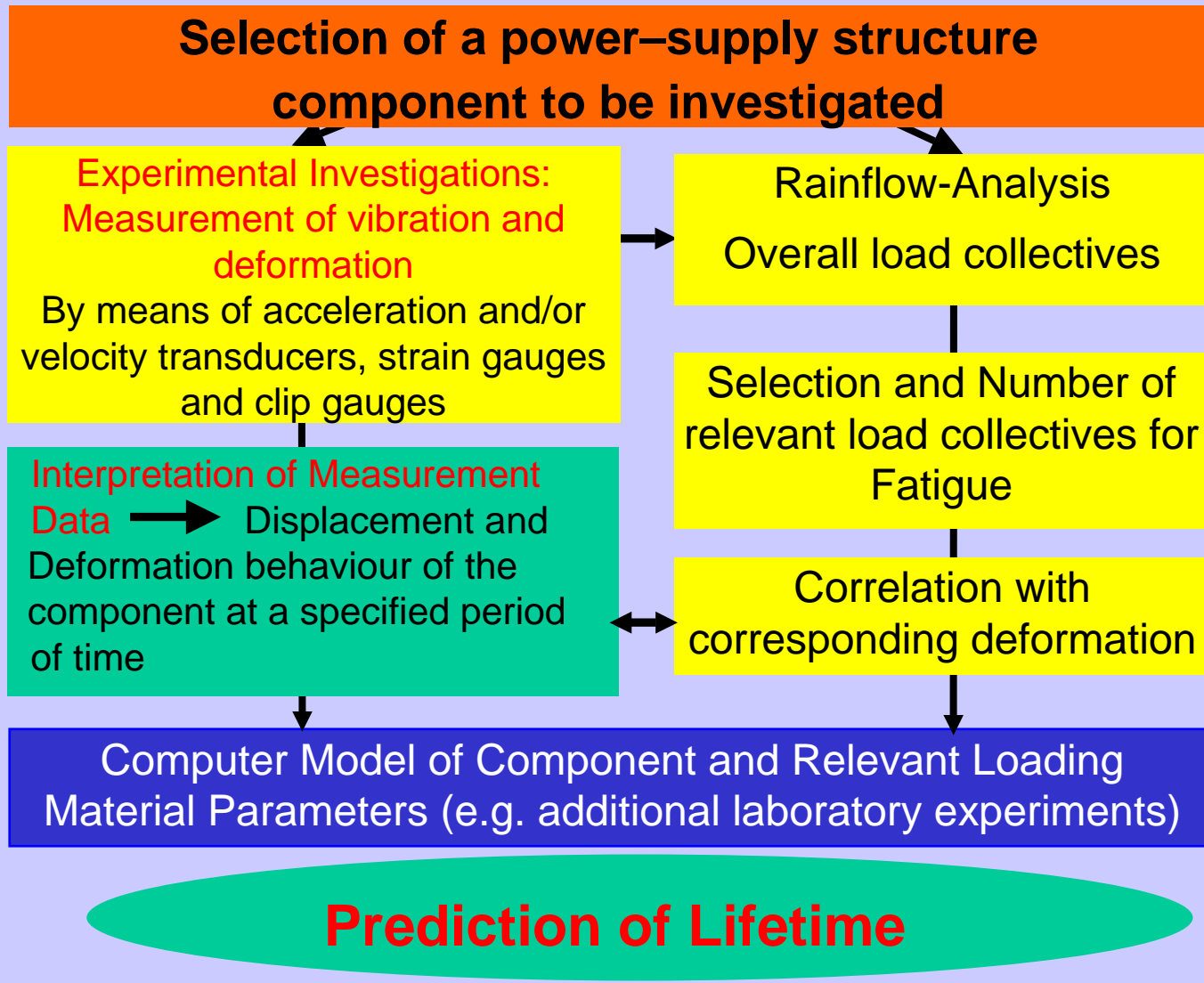
If the damage mechanism are known, measurement results allow a continuously evaluation of the damage mechanisms on the service life of a component.

The planned research work includes the coupling of

- experimental and
- analytical/numerical investigations.

The measurement quantities and measurement sites to determine are chosen in this way that an exact

quantification of global and local loading and determination of the life time consumption is possible.





Research Work

All highly loaded zones of the pillar-construction (flanges, screwed connections and other points with stress concentrations) shall be localised by means of coupling measurement and calculated data. A full stress and strain analysis based on finite-element calculations is now possible for locations not accessible.

Furthermore, loading and load collectives will be classified e.g. according to the magnitude of relevant wind velocity. Fatigue analyses determine the usage of life time. Thus the rate of the load collectives per year and therefore the relation to the whole time of operation can be determined by this advanced procedure.



Results

Service life prognosis is now possible allocated to

- **meteorological data and**
- **the material characteristics**

necessary for fatigue analyses.

On this basis it is also possible to evaluate integrity assessments and to derivate the requirements of inspection intervals.



End of MPA - Presentation



**thank you
for your
patience**