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**Analysing the increasing  
role and use of condition  
monitoring systems for  
O&M**

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# The value of condition monitoring

- The increasing numbers of multi-MW turbines require an accurate and cost-effective condition monitoring system to be put in place in order to achieve high availability, reliability and maintain wind farm profitability
- It is well known that the loads sustained by wind turbines vary continuously due to change in wind speed and direction
- The calculated value of the condition monitoring criterion can exceed the designed thresholds due to a wind gust and then trigger an alarm even if the turbine is perfect and no fault actually occurs in it

# Prognosis over Simple Diagnosis

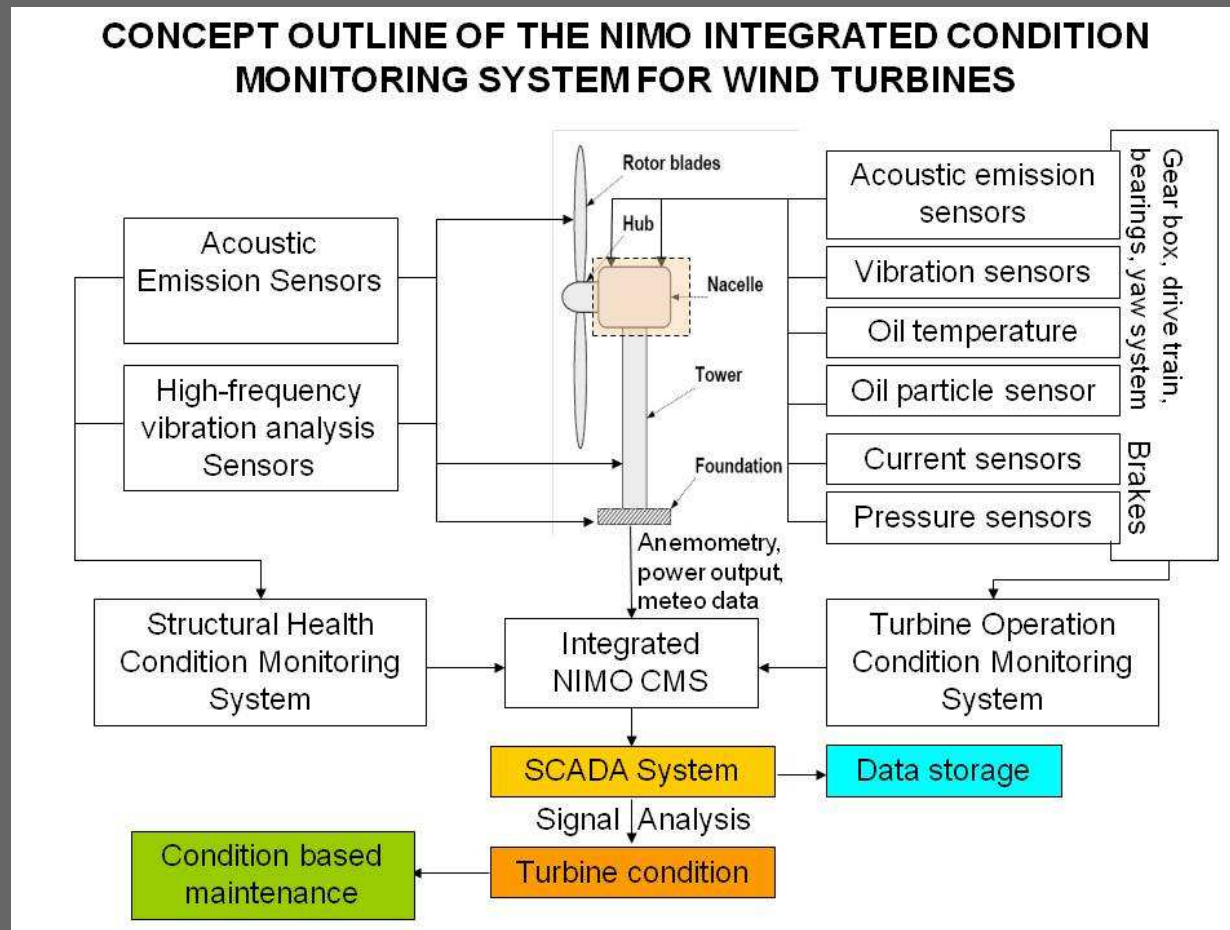
- Existing condition monitoring systems have no or limited capacity for prognosis
- Maintenance strategies are usually corrective or at best condition-based, i.e. based on the current condition of the component if this has been assessed correctly by the CMS or preventive, i.e. before the final failure occurs and leads to the shutdown of the wind turbine

# Sustainability of corrective CM

- For onshore wind farms corrective maintenance approaches are workable although not optimum
- For offshore wind farms this maintenance strategy is unsustainable
- Prognostic maintenance offers significant advantages to wind farm operators increasing sustainability and profitability of such projects

# Integrated diagnostics

## CONCEPT OUTLINE OF THE NIMO INTEGRATED CONDITION MONITORING SYSTEM FOR WIND TURBINES



# Integrated prognostics

