



AWEA WEBINAR

Lead-time to drivetrain component failure and the impact of your O&M strategy

December 6, 2016





A SHORT INTRODUCTION TO BRÜEL & KJÆR VIBRO



- **60+** years of experience in Condition Monitoring
- Pioneers within the wind turbine monitoring industry
- First CMS solution installed in **1999**
- **Thousands** of wind turbines monitored daily
- World-wide remote diagnostics coverage via centers in the US, China and Denmark





Your presenter today:

Reynir Hilmisson

Lead Diagnostic Engineer
North America
Remote Monitoring Group

With B&K Vibro since 2009
and CAT 4 Vibration Monitoring
Expert





"LEAD-TIME" IN PREDICTIVE MAINTENANCE DEMYSTIFIED



WHY CONDITION MONITORING (CMS) FOR WIND TURBINES?

1. No catastrophic failures
2. More efficient use of cranes
3. Reduction of downtimes
4. AEP

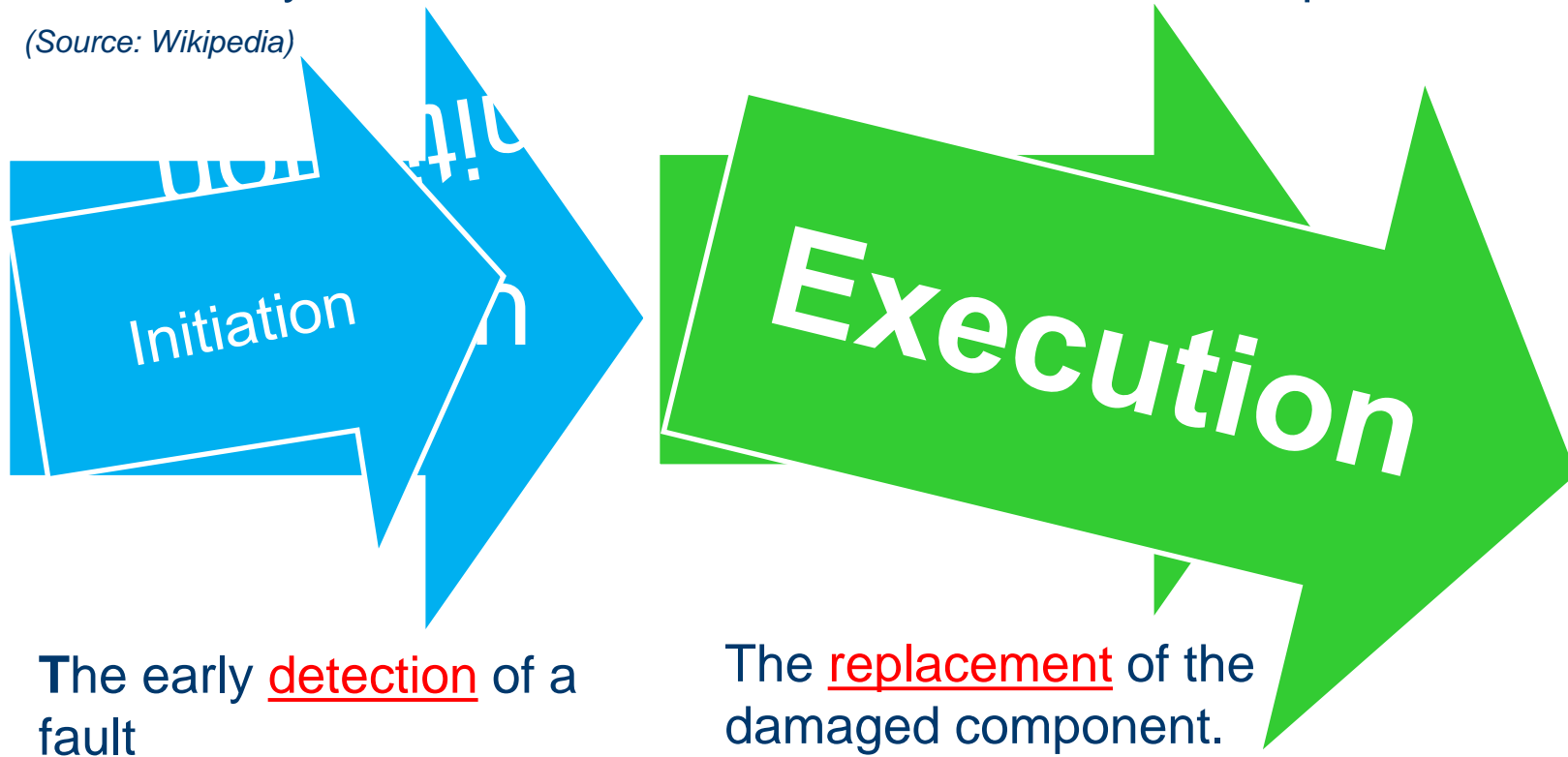




Lead-time =

“The latency between the **initiation** and **execution** of a process.”

(Source: Wikipedia)





Lead-time to failure depends on

a) The component/failure mode.

Example: Multi-stage gearbox





Lead-time to failure depends on

b) The quality of the service provider and the information they deliver





Case:



Windpark I
– coming
out of
warranty;
O&O „A“



Windpark II;
past
warranty;
O&O „B“

- Developing fault reported
- Second inspection
- Fault confirmed,
replacement planned
- Secondary damages and
major repair due to delay in
spare part delivery

- Developing fault reported
- Limited access to site
- Replacement scheduled
based on weather
conditions, not on
remaining life-time



The planning after a fault has been detected early depends on the O&M strategy

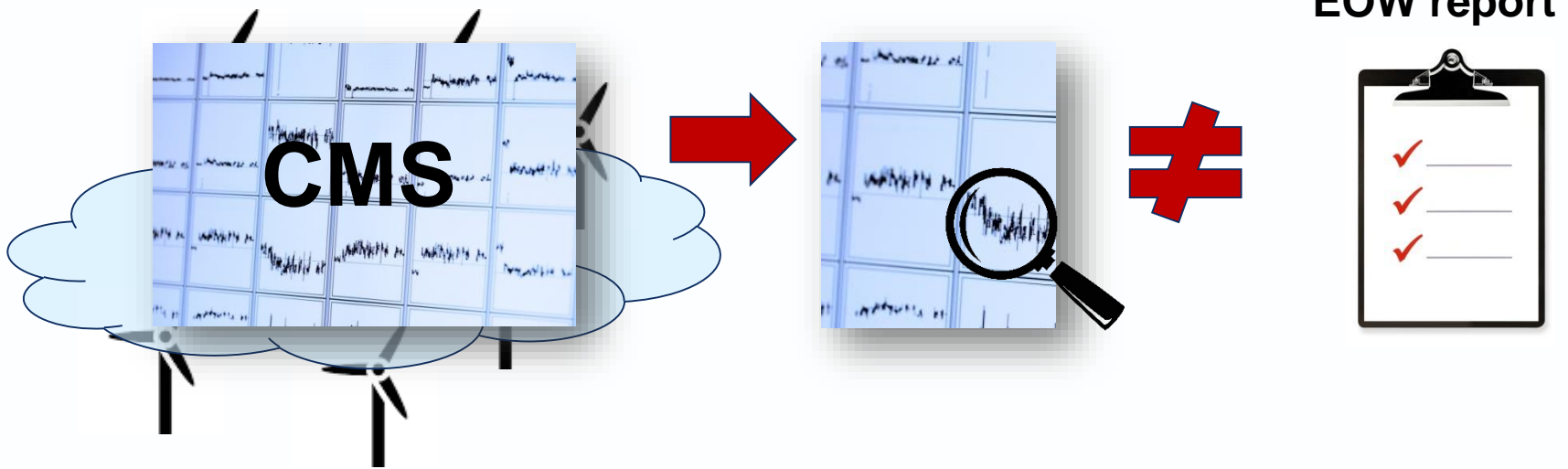
“Lead-time“ ≠ “Lead-time“!



EARLY FAULT DETECTION AND THE EYE OF THE BEHOLDER






Case:





CMS:

- Optimum O&M activities 
- Critical input to the O&O's planning/scheduling process 
- Fleet meets and exceeds its design life 



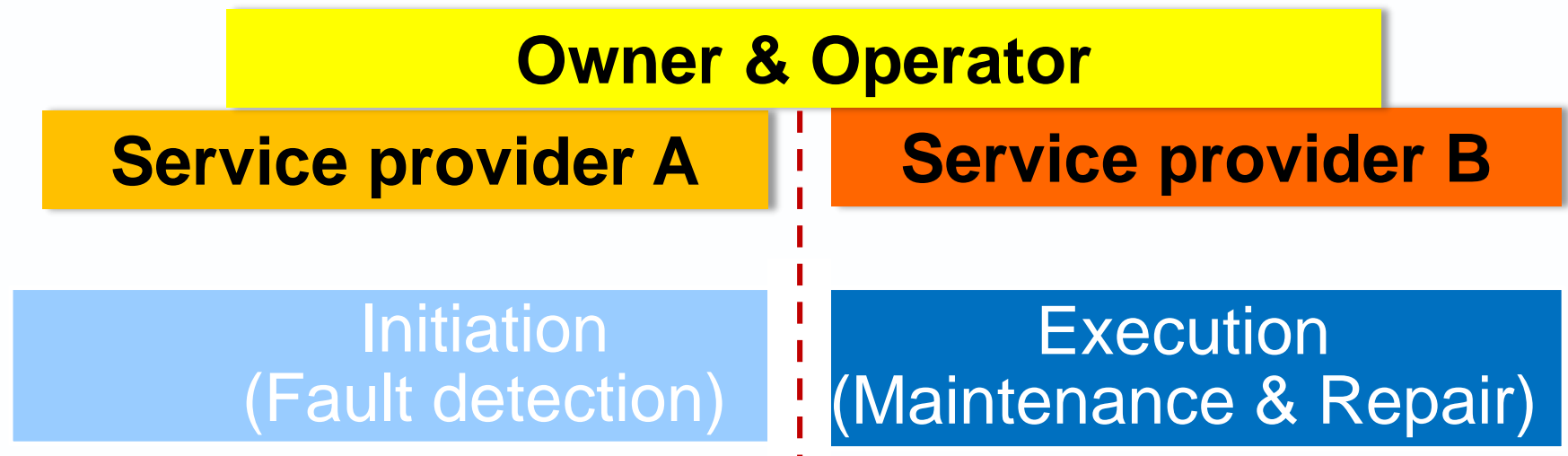
MAINTENANCE STRATEGY MODELS

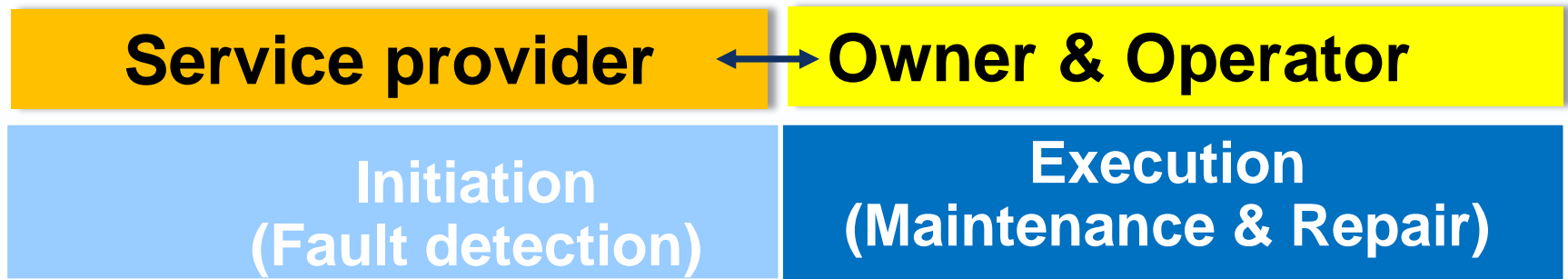


Owner & Operator

Initiation
(Fault detection)

Execution
(Maintenance & Repair)







TAKE AWAYS & KEY LEARNINGS



When you are handed the keys by your OEM at the end of warranty,

do you really know how your turbines are doing?





Are your service partners

- Independent** (no conflict of interest)?
- Unbiased** and provide **unrestricted** information?
- Available **24/7** and provide **local support**?
- An experienced team**?

**IT IS NOT ALL ABOUT PRICING BUT RATHER
ABOUT PROTECTING YOUR INVESTMENT !**



FINAL THOUGHTS



Lead-time to drivetrain component failure depends on:

- Your O&M strategy
- The quality of your partner(s) with respect to their product, skillset and proven record
- The knowledge you have about your assets and available resources!



CMS Benefits:

- Compelling value propositions** to everyone
(Owners & Operators, OEMs and service providers)
- Deployments can be made easy, bringing instant **business value!**
- The right CMS solution not only protects your assets, it guarantees a **quick payback!**



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THANK YOU FOR YOUR ATTENTION
TIME FOR QUESTIONS



ADDITIONAL QUESTIONS?

Please contact

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