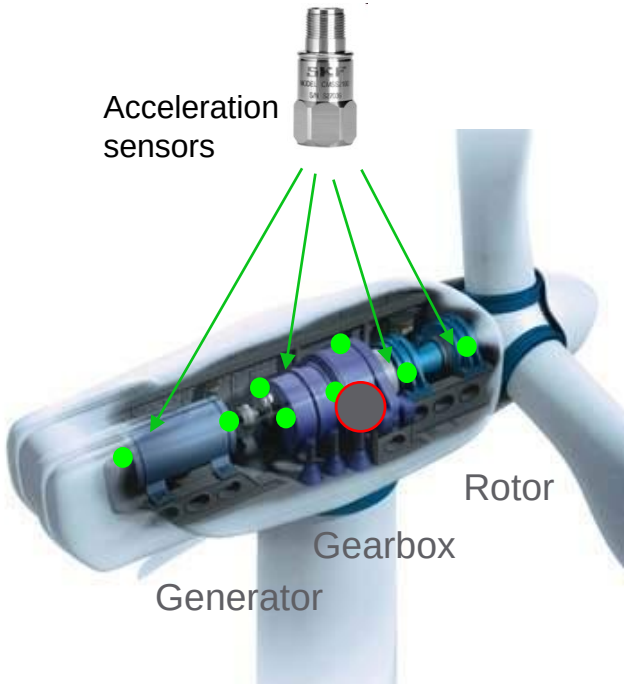
Statistical approach to improve prediction capability of CMS

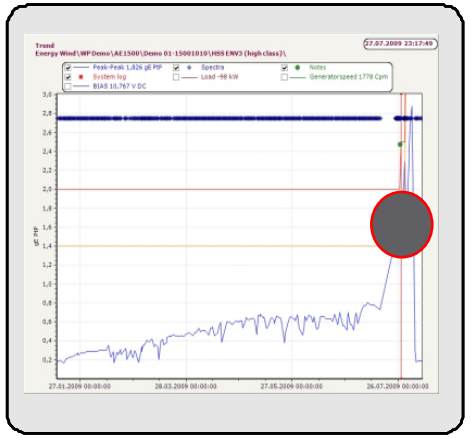
Fabrice Drommi, Business Development Manager Wind, Windergy, April 2017

Diagnostic workflow on wind turbines



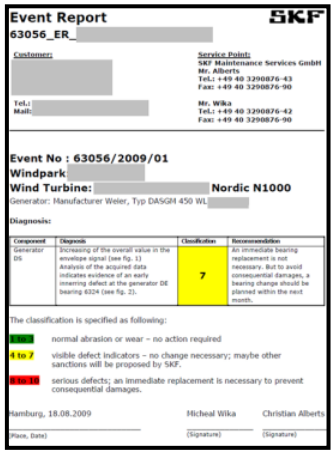
Monitoring unit (SKF IMx)

Automatic alarms



SKF RDC Remote Diagnostic Centre

- **Data analysis**
- **Condition investigation**
- **Recommendation**


Event Report

SKF

63056_ER_

Customer:

Service Point:
SKF Maintenance Services GmbH
Mr. Alberts
Tel.: +49 40 3290876-43
Fax: +49 40 3290876-90

Tel.:
Mail:

Mr. Wika
Tel.: +49 40 3290876-42
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Event No : 63056/2009/01
Windpark
Wind Turbine: Nordic N1000
Generator: Manufacturer Weier, Typ DASGM 450 WL

Diagnosis:

Component	Diagnosis	Classification	Recommendation
Generator DS	Increasing of the overall value in the envelope signal (see fig. 1) Analysis of the acquired data indicates evidence of an early inner-ring defect at the generator DE bearing 6324 (see fig. 2).	7	An immediate bearing replacement is not necessary. But to avoid consequential damages, a bearing change should be planned within the next month.

The classification is specified as following:

1 to 3 normal abrasion or wear – no action required

4 to 7 visible defect indicators – no change necessary; maybe other sanctions will be proposed by SKF.

8 to 10 serious defects; an immediate replacement is necessary to prevent consequential damages.

Hamburg, 18.08.2009 Micheal Wika Christian Alberts

Place, Date) (Signature) (Signature)

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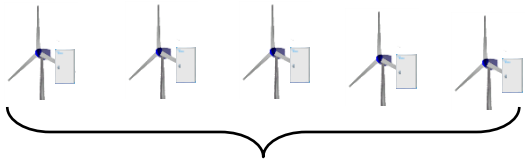
Fleet analysis → Decision guidance



Data collection:

- Approx. 2 MB /day/WTG

Post processing:

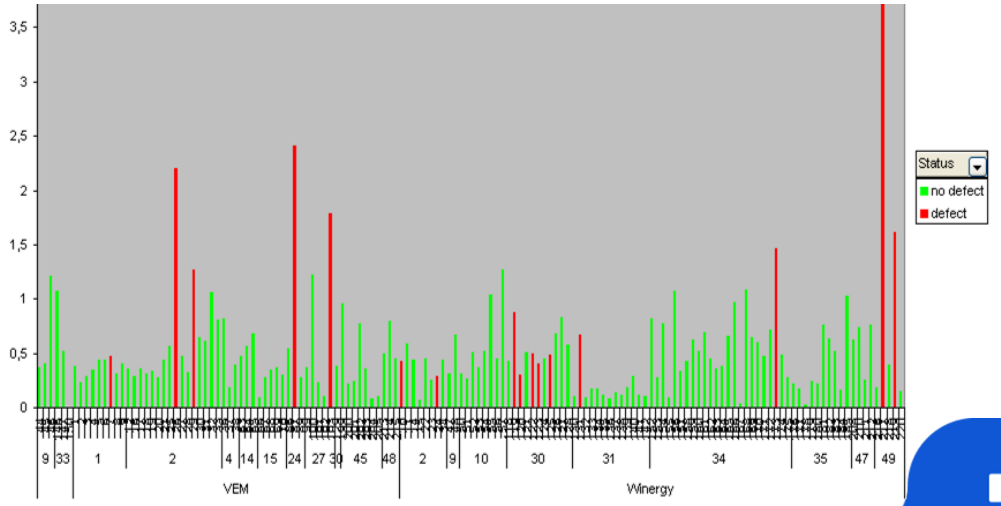
- Data preparation
- Filtering / selecting
- Highlighting

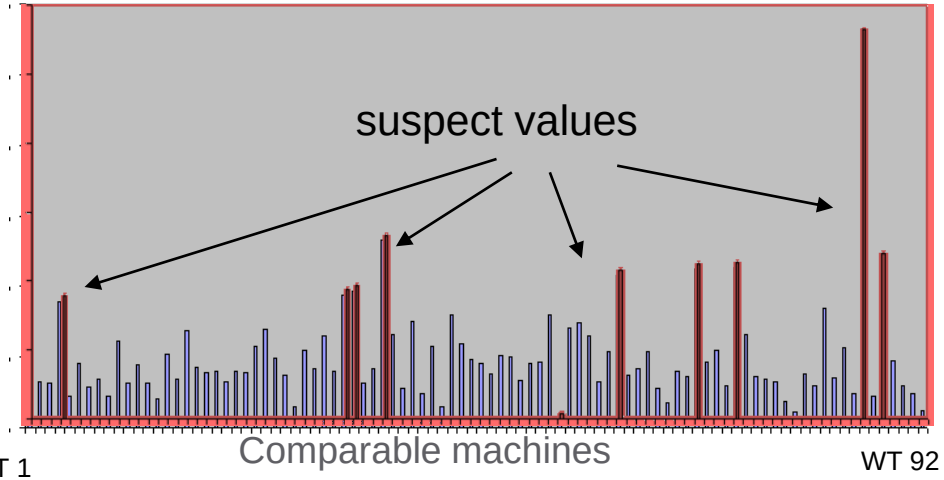
SKF Cloud

Deeper analysis

Reporting

Filtering and correction; knowledge of machine pool





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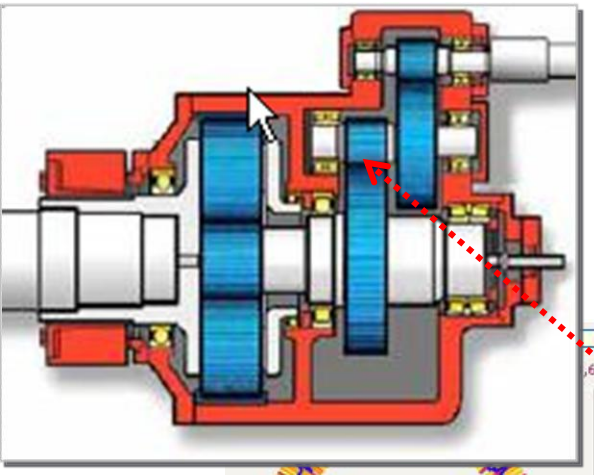
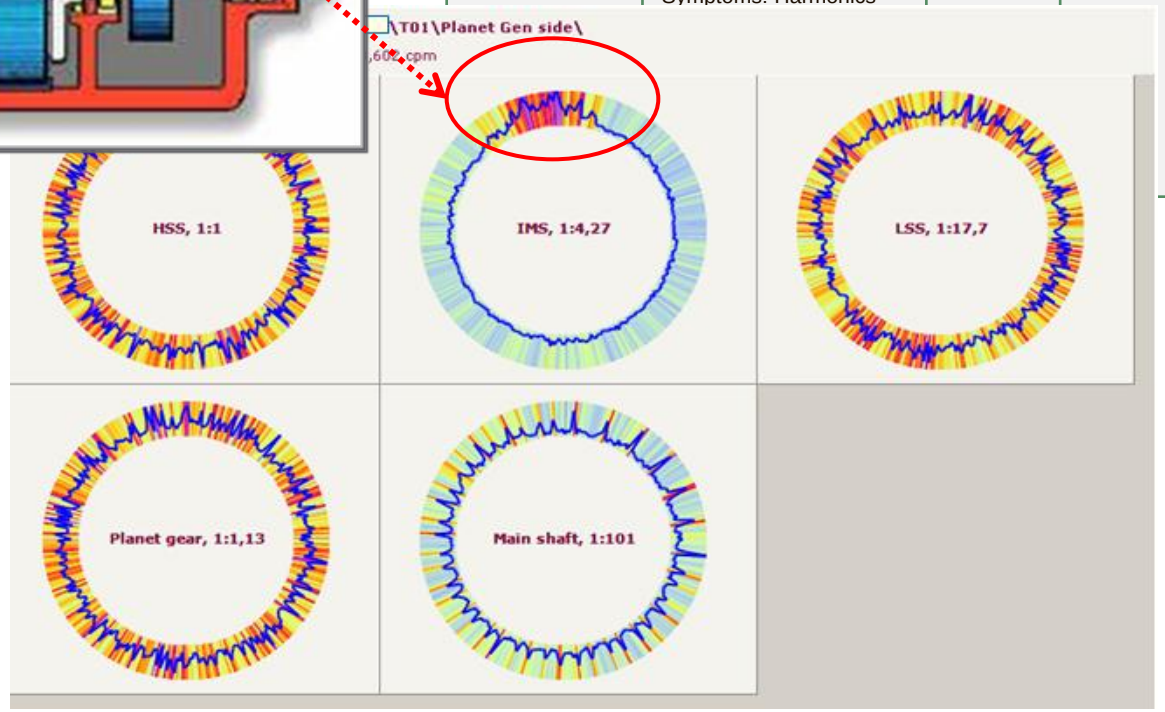
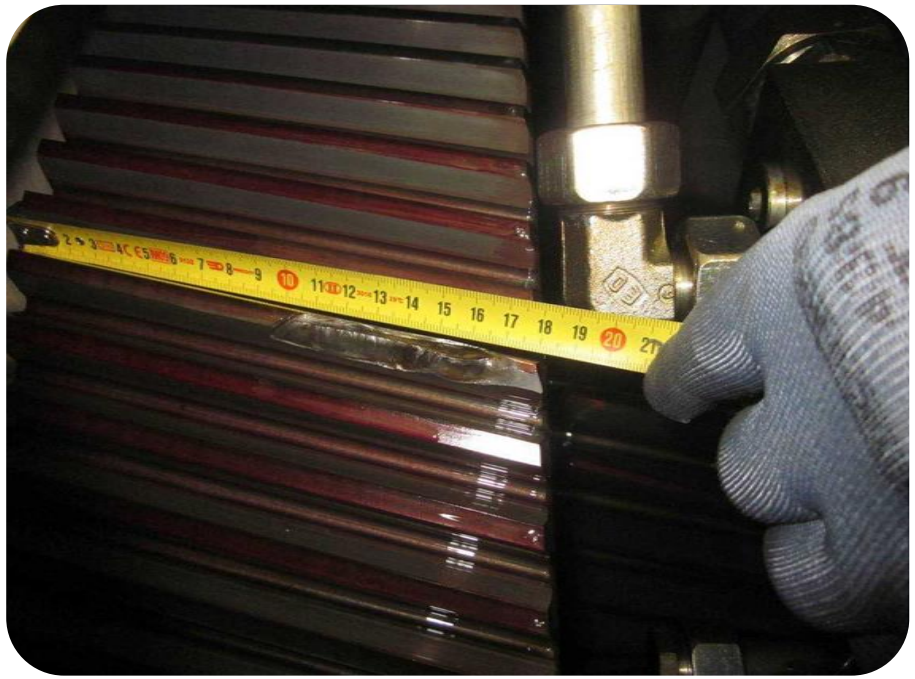
Case example; SKF @ptitude Observer Gear Inspector revealed damaged pinion – enabled timely action



Diagnosis:

Component	Description	Evaluation	Recommendation
IMS Pinion	Observations: Evolution on the overall vibration values and some signals – Clear peaks and harmonics are seen on signal. Symptoms: Harmonics	8	Boroscopy visit needs to be planned to check the condition of the teeth on IMS shaft





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Conclusion on CMS / RDS use on Gearbox

- CMS is cost effective
- Even planetary issues can be picked up
- No need of long term data analysis to get efficient findings
- CMS value is obtained with the right indicators, alarm levels, trending and visual tools like SKF @ptitude Observer Gear Inspector

SKF Imx-8

SKF Imx-W

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