Service life cycle example

Case Study

MOVENTAS
ITALY

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Service Engineer

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Services spanning from predictive maintenance to up-tower repairs

Moventas high-qualified technicians and engineers can perform up-tower repairs even on non-Moventas gearboxes. Moventas team in Italy has recently completed successfully an up-tower repair on a 2 MW wind turbine. The work included the replacement of intermediate shaft (IMS) assembly and high-speed shaft rotor side bearing (HSS RS).

The defects were initially detected by our remote Condition Management System – CMaS, which keeps a watchful eye on seven key parameters: temperature, vibration, load, pressure, RPM, oil condition and oil particles. Thanks to CMaS, it was possible to prepare the maintenance activity largely in advance, minimizing the downtime of the turbine and preventing further failures of the gearbox components. CMaS showed an increasing of the overall parameters, such as the acceleration values (figure 1 and 2) and the cumulative oil particles (figure 3).

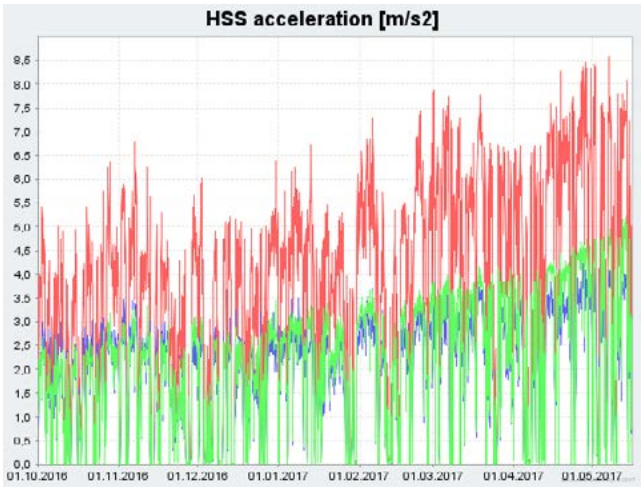

Figure 1

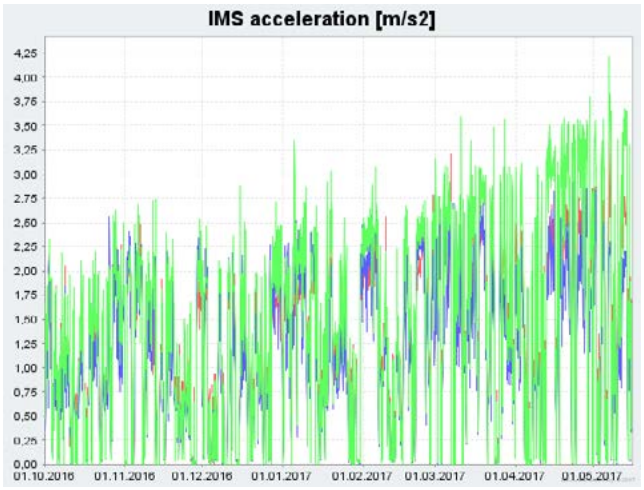

Figure 2

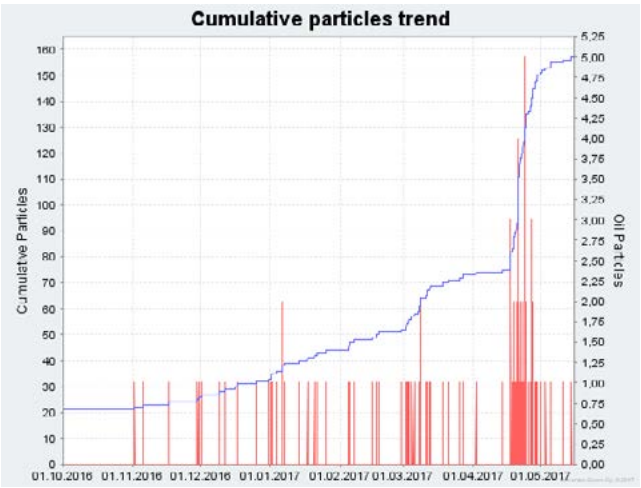

Figure 3

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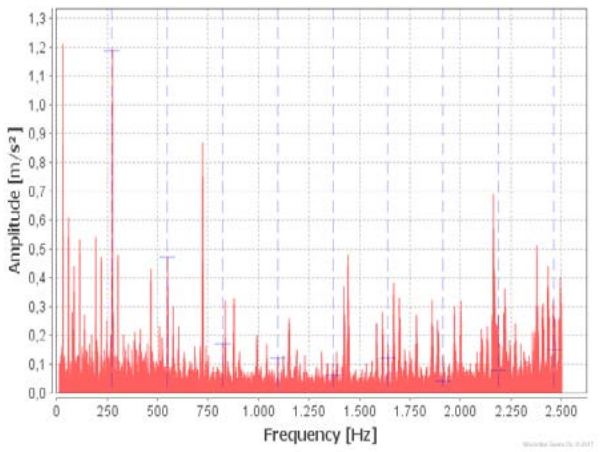
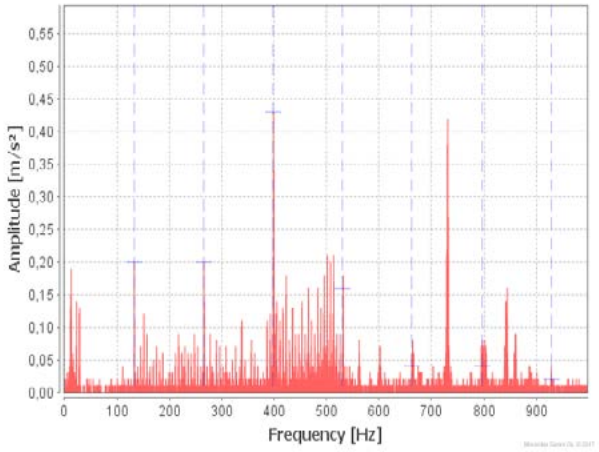
A deeper vibration analysis revealed a defect on the inner race of HSS RS bearing and on IMS pinion.





The endoscopic inspection confirmed the results of the vibration analysis. A broken tooth was detected on the IMS pinion and the HSS RS bearing was found in bad condition. Widespread indentations were detected on the outer race, as well as initial spalling. Rolling elements were affected by polishing. Unfortunately, the inner race could not have been inspected.

Picture 1
Broken tooth of IMS pinion.

Picture 2
Bad condition of HSS RS bearing outer race and rolling elements.

Following the vibration analysis and the endoscopic inspection, Moventas technicians performed the replacement of IMS assembly and HSS RS bearing.

Moventas has developed special tools for replacing the HSS RS bearing without extracting the entire high- speed shaft, which saved time and reduced the costs.

Benefits of CMaS services

PREPARE THE MAINTENANCE

MINIMIZE DOWNTIME

PREVENT FAILURES

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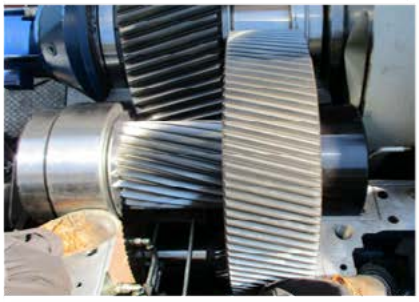
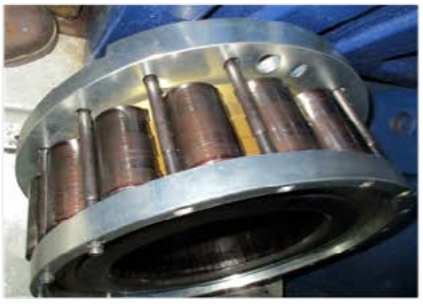
Picture 4.
Housing opening.

Picture 5.
Damaged IMS shaft.

Picture 6.
Damaged IMS removal.



Picture 7.
New IMS installed.



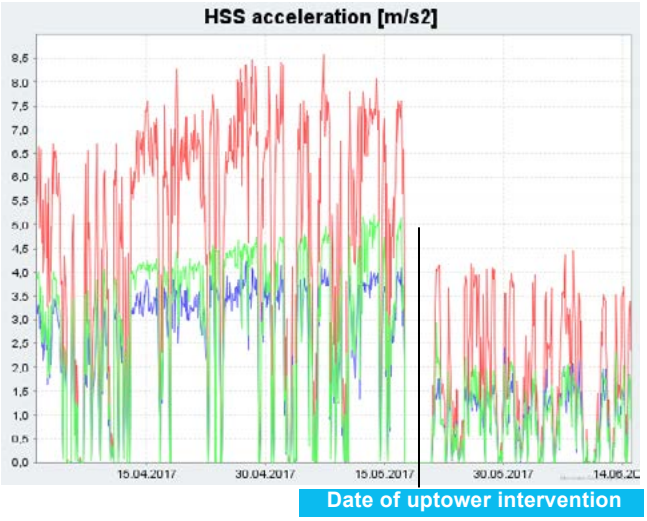
Picture 5.
Damaged HSS RS bearing.

Picture 6.
New HSS RS bearing.

Conclusion

After the intervention, the values of the overall parameters have significantly decreased, as shown in the following picture.

Thanks to Moventas experience and innovative solutions, the downtime lasted just three days.



Moventas is a specialist in condition monitoring

Moventas provides a top level service in condition monitoring and diagnosis of the main components of wind turbines. Our condition monitoring engineers in the Condition Monitoring Centers in Finland, USA and Italy, provide customers high level support and training.

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