

GfM Gesellschaft für Maschinendiagnose mbH

Machine diagnosis report

Customer: ### GmbH
Meas. engineer, date, time: Mr. ###, 24.10.2012, 4:45 p.m.
Measuring system: PeakStore
Turbine operator: ###
Turbine supplier, type, SN: ###, ###, ###
Gear unit supplier, type, SN: ###, ###, 22045
Generator supplier, type, SN: ###, ###, 5142702
Kinematics data source: delivered with order
Power during meas. in kW: approx. ###
Wind speed in m/s: approx. ###
Generator speed in 1/min: approx. ###
Consultant GfM: Dipl.-Ing. (FH) René Schubert
Reference report no.: -
GfM no.: E#####0e1
Number of pages: 6

Berlin, 2. March 2016

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Please find details of the measuring method and of the shortcuts on our homepage www.maschinendiagnose.com/diagnostic-report or please ask for information in written.

The given statements in the report are based on a time slot of the vibration signal according to the measuring time. Consequently are detectable irregularities, which according to the construction and the mode of operation causes untypical vibrations. Irregularities at the toothing are only detectable at enough distribution of forces. The detection bearing irregularities works, if these have a local character and are passed forceful enough by the rolling elements.

For the detected irregularities are made recommendations only on the basis of the vibration signal and if possible a failure probability is stated. For the exact quantification of irregularities have to be executed further test method.

(Unfortunately, in this sample report we need to make the rolling bearing designations illegible for reasons of confidentiality.)

Diagnosis result:

no.		found irregularities	trend	recommendation	$P_{\tau < 1a}$
rotor:					
11	rotor shaft				
12	rotor bearing				
gear shafts:					
21	planet carrier 1				
22	planets 1				
23	sun 1 = carrier 2				
24	planets 2				
25	sun 2 = LS shaft				
26	HS shaft				
tooth meshing of gear unit:					
31	planetary stage 1	indication of local deviation flank shapes at the sun (fig. 3)			< 5 %
32	planetary stage 2				
33	high speed stage	indication of rotating deviation flank shapes (fig. 1)			< 5 %
		indication of local deviation flank shapes at the wheel and pinion (fig. 5)			
gear unit bearings:					
41	planet carrier 1				
42	planets 1	indication to irregularities on at least one planet bearing (fig. 2)			< 5 %
43	sun 1 = carrier 2				
44	planets 2	indication to irregularities on at least one planet bearing (fig. 4)			< 5 %
45	sun2 = LS shaft				
46	HS shaft	outer ring bearing ### already detectable in the spectra (fig. 1)		visual inspection if possible	20 %
		inner ring bearing ### (fig. 6)		visual inspection if possible	< 5 %
generator:					
51	shaft				
52	DE bearing	cage and outer ring bearing ### (fig. 7) already detectable in the spectra (fig. 8)		visual inspection if possible	20 %
53	NDE bearing	cage and outer ring bearing ### (fig. 9)			< 5 %

trend - comparison to the last report, see reference report

- ↑ - intensity of irregularities increased
- - intensity of irregularities almost unchanged
- ↓ - intensity of irregularities decreased

n.p. - comparison not possible, because e.g. the measurement conditions were different

$P_{\tau < 1a}$ - estimated probability, that the by the vibration diagnosis assumed irregularity will lead to a failure within the next 12 months

- < 5 % - a minimal irregularity is detectable, no need for action
- 20 % - one of five of such irregularities will lead to a failure within one year
- 50 % - one of two of such irregularities will lead to a failure within one year

Spectra:

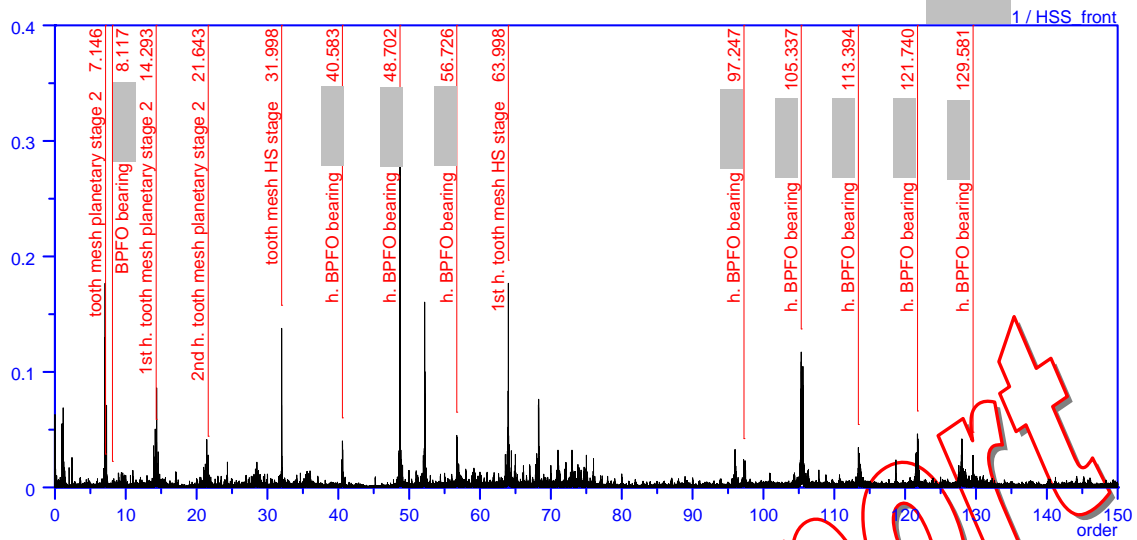


Figure 1: Order spectrum, measured at the high speed shaft, rotor sided, radial

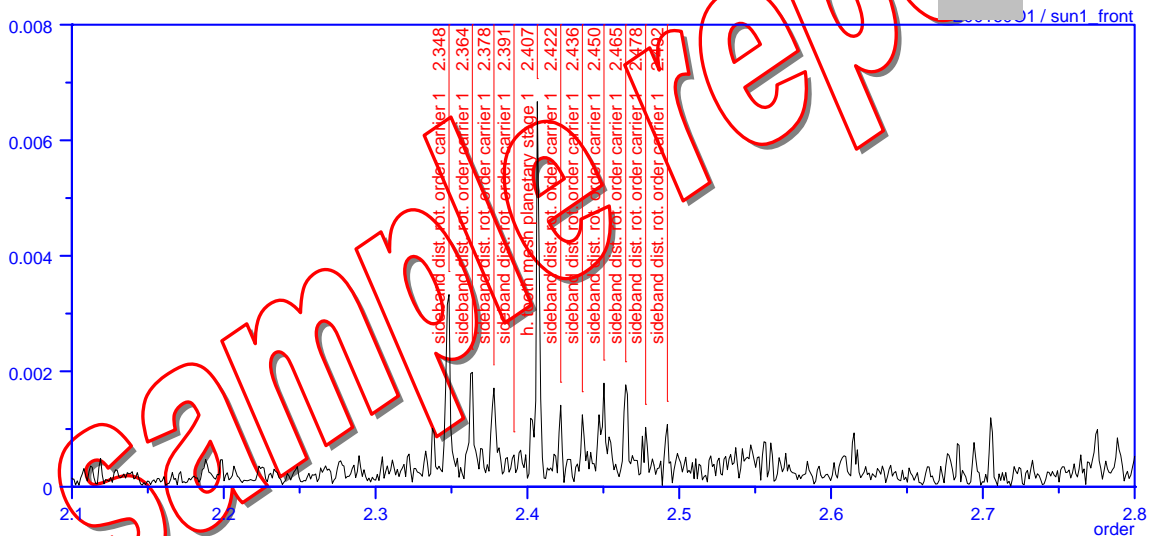


Figure 2: Order spectrum, measured at the sun 1, rotor sided, radial

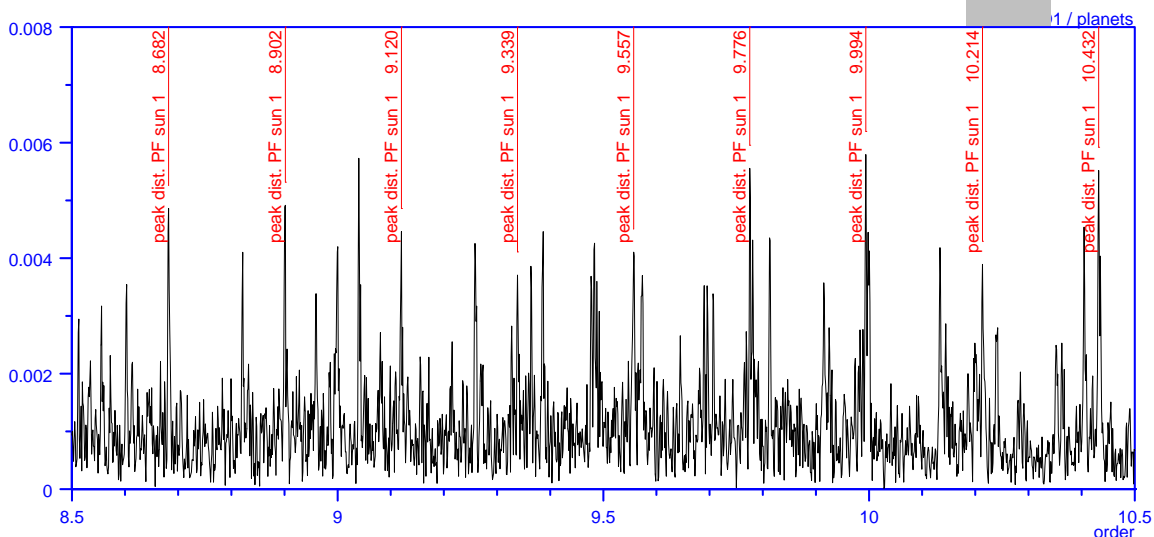


Figure 3: Order spectrum, measured at the planets 1, rotor sided, radial

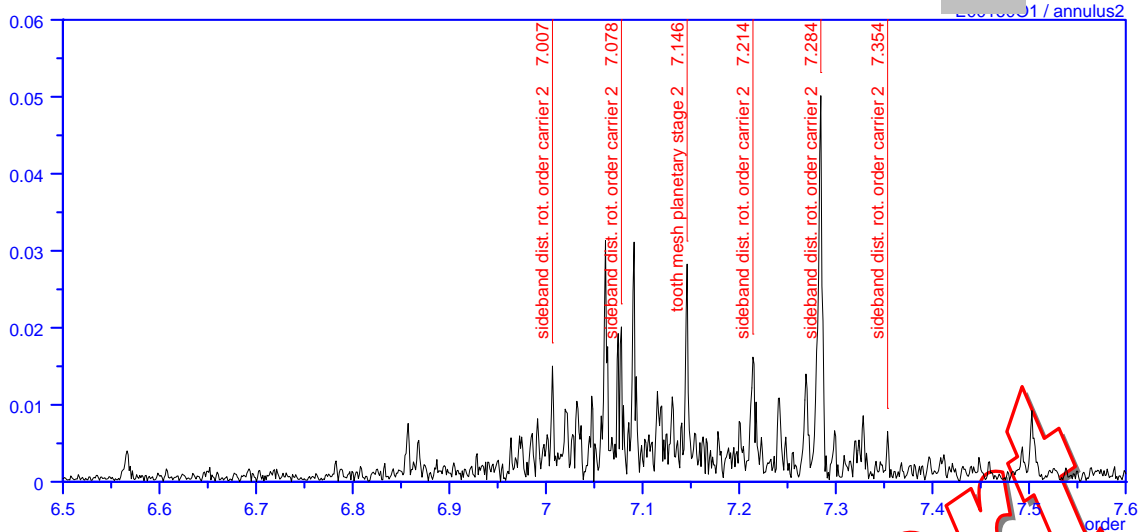


Figure 4: Order spectrum, measured at the annulus 2, rotor sided, radial

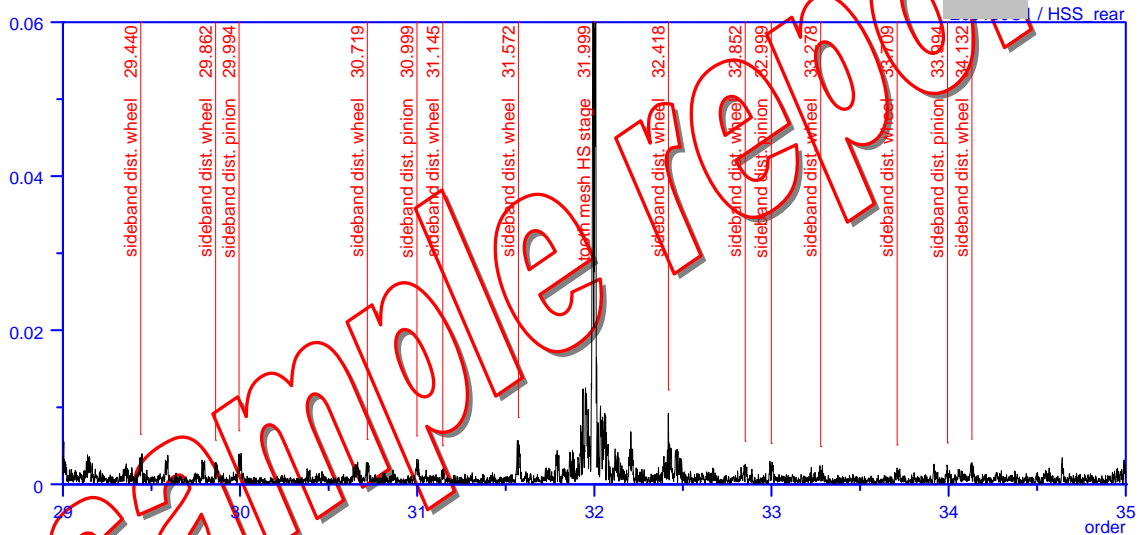


Figure 5: Order spectrum, measured at the high speed shaft, generator sided, radial

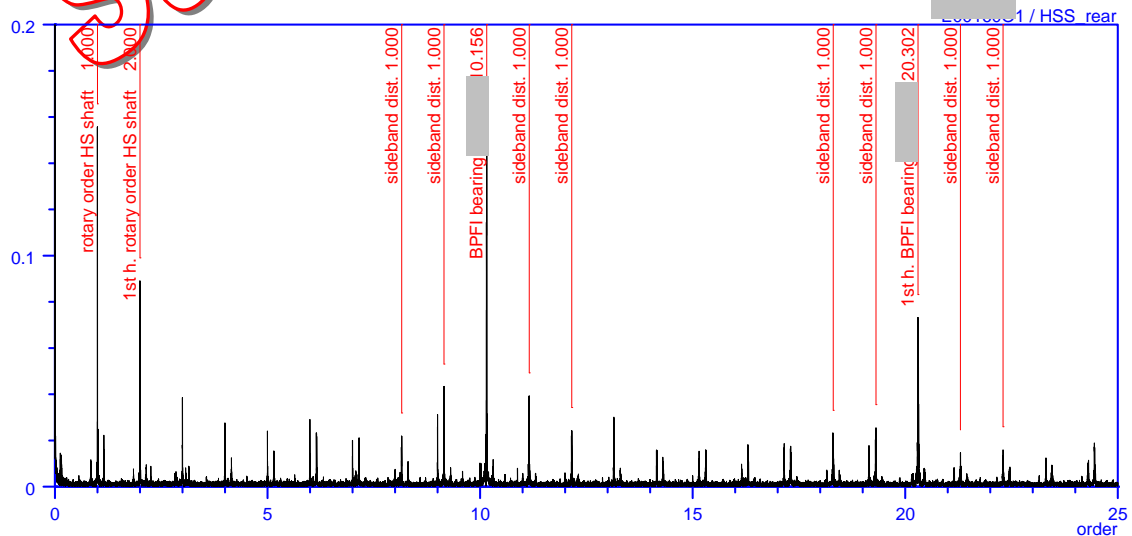


Figure 6: Envelope curve order spectrum, measured at the high speed shaft, generator sided, radial

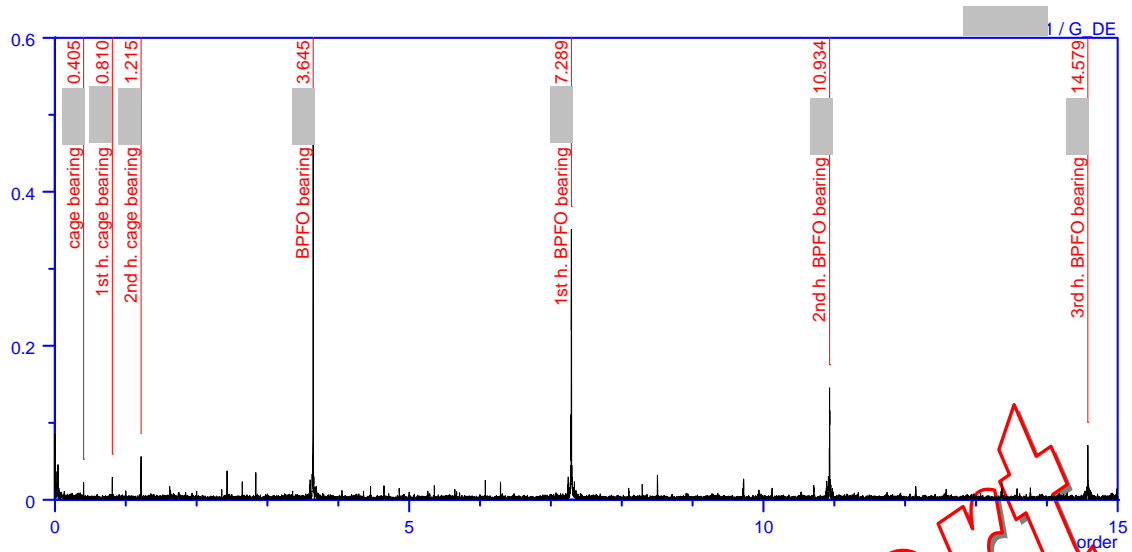


Figure 7: Envelope curve order spectrum, measured at the generator, drive end, radial

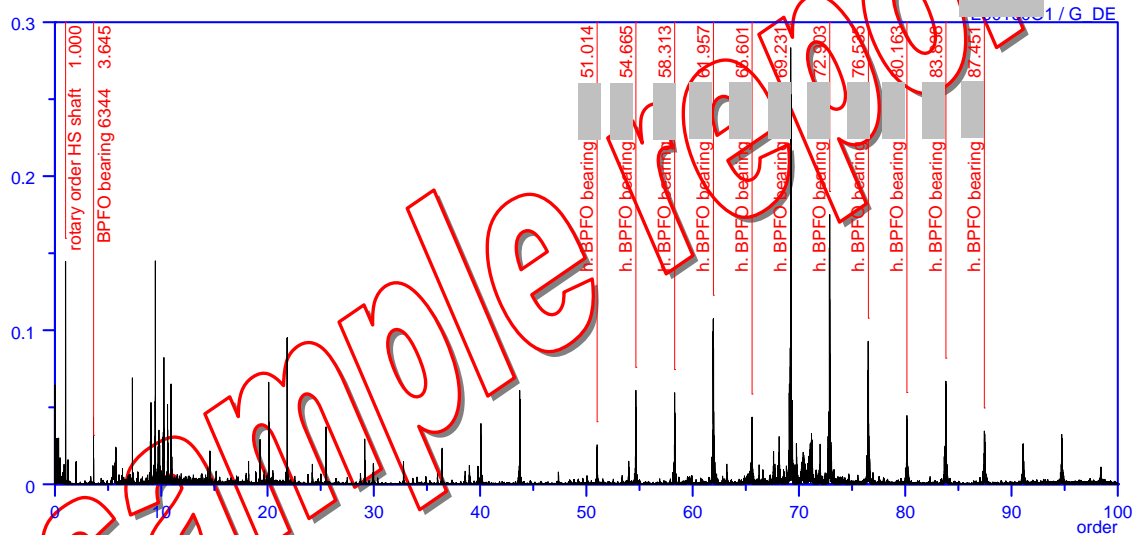


Figure 8: Order spectrum, measured at the generator, drive end, radial

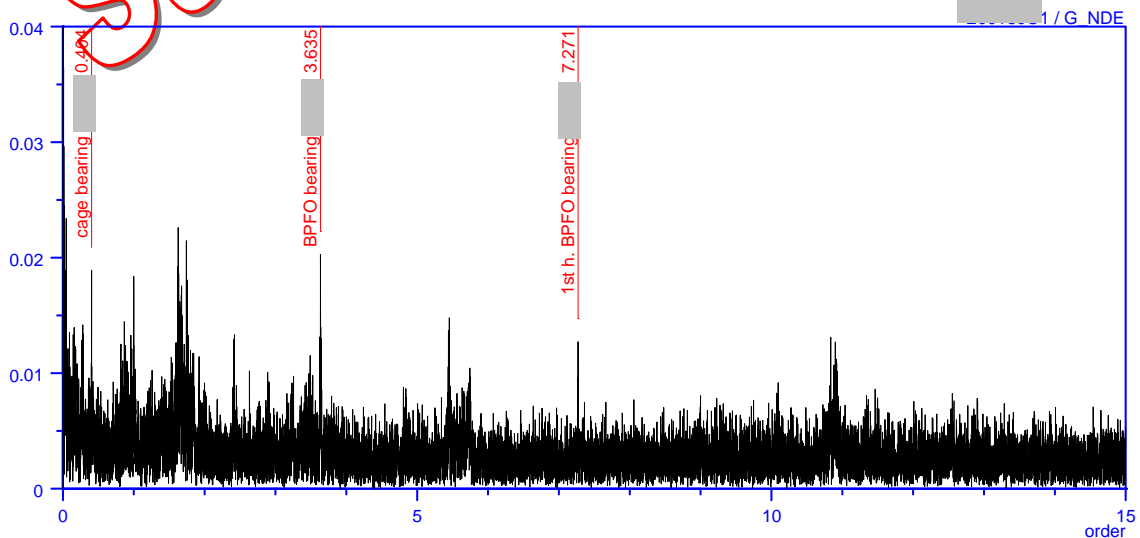


Figure 9: Envelope curve order spectrum, measured at the generator, non drive end, radial

Kinematics:

Table 1: Kinematics (theoretic) in order

(Unfortunately, in this sample report we renounce the representation of the kinematic table for reasons of confidentiality.)

sample report