

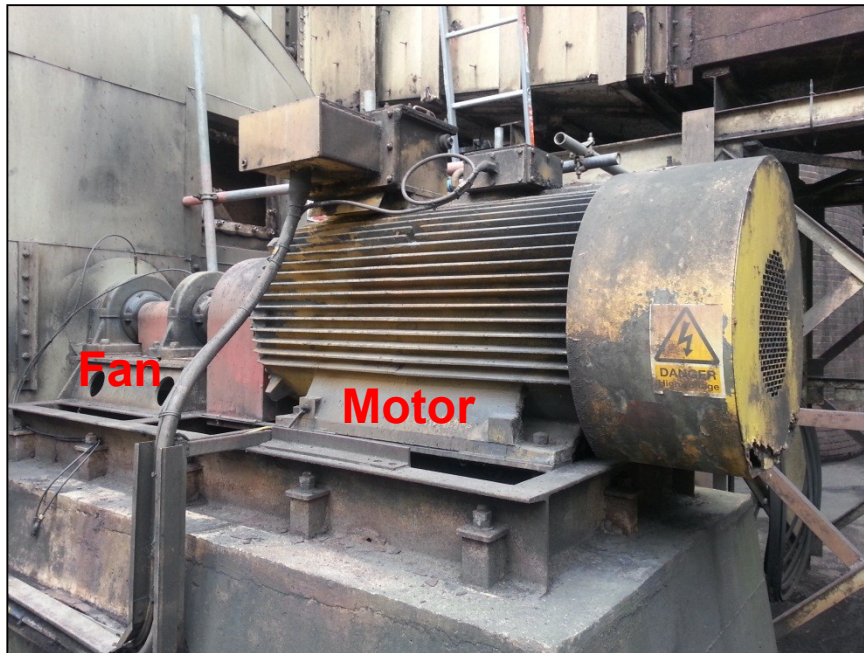
Vibration Analysis

Case Study – Gas Recycle Fan

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Reliability Maintenance Solutions Ltd

Vibration Analysis – Gas Recycle Fan

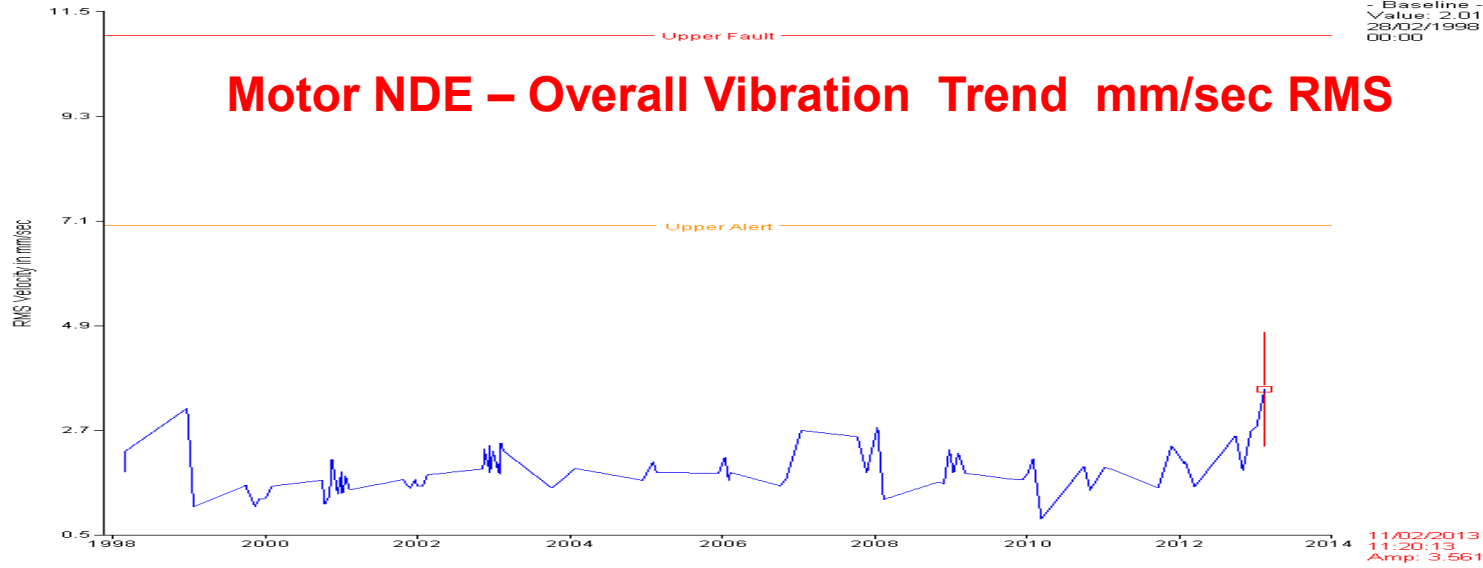


- The Gas Recycle Fan is part of an Animal Feeds Dryer Plant
- It is critical for the operation of the Dryer Plant. Failure will result in Dryer Plant shutdown
- Monthly Vibration readings are taken throughout the operation period.
- In Sept 2012 it was noticed an increase in vibration levels in the 3-4XRPM band on the motor NDE horizontal reading

DRAF - DRIERS / 38FANS618M - GAS RECYCLE FAN
1H - MOTOR NDE HORIZONTAL

Overall Value
- Baseline -
Value: 2.019
28/02/1998
00:00

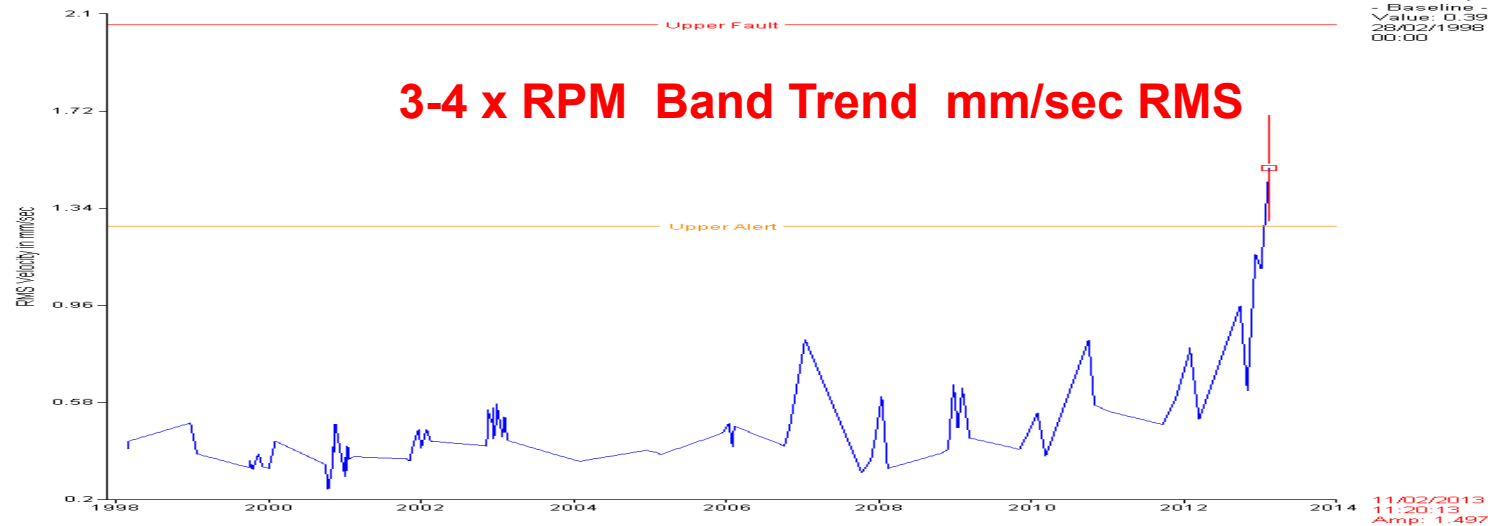
Motor NDE – Overall Vibration Trend mm/sec RMS



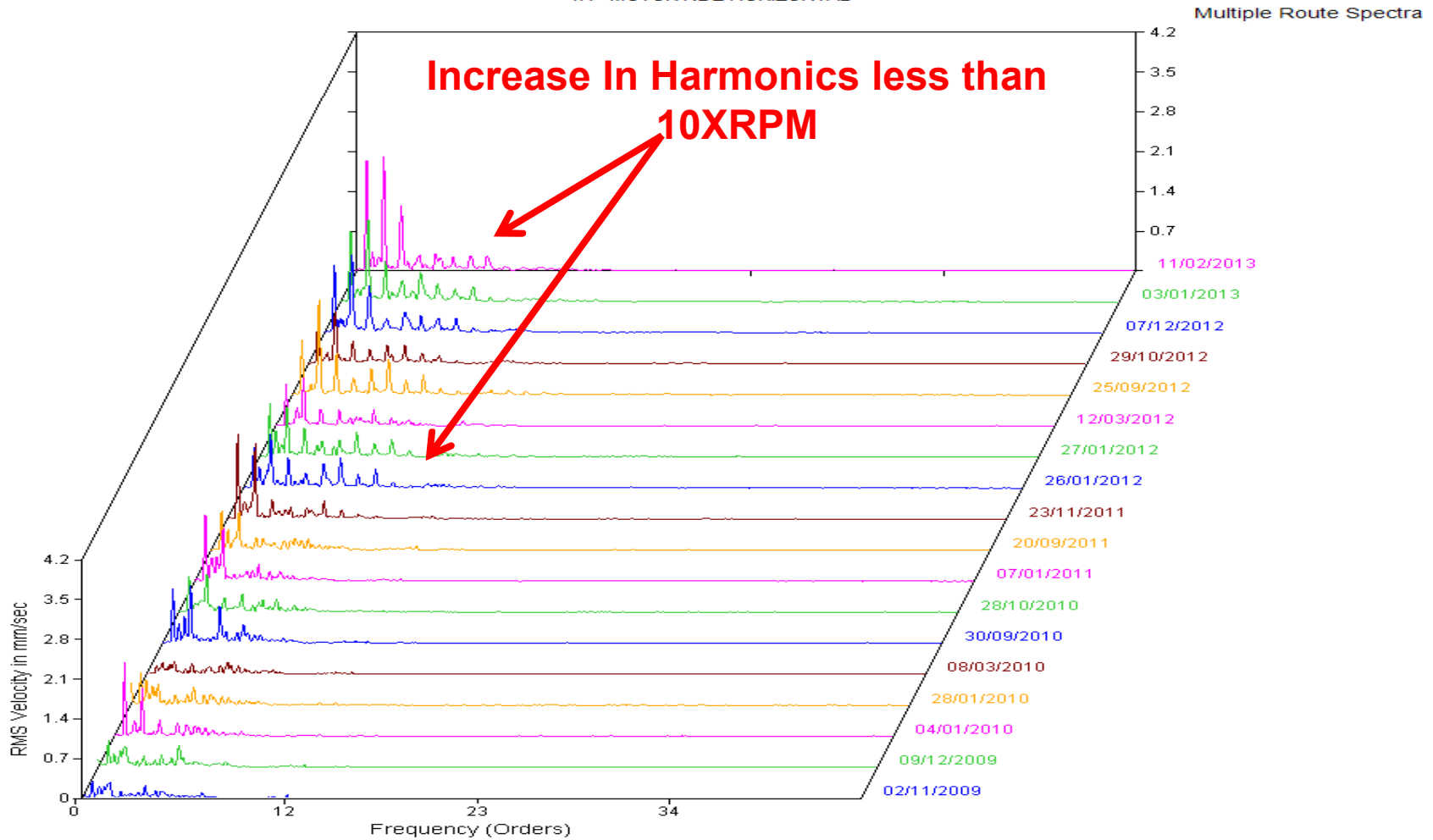
DRAF - DRIERS / 38FANS618M - GAS RECYCLE FAN
1H - MOTOR NDE HORIZONTAL

3-4xrpm/loose
- Baseline -
Value: 0.397
28/02/1998
00:00

3-4 x RPM Band Trend mm/sec RMS



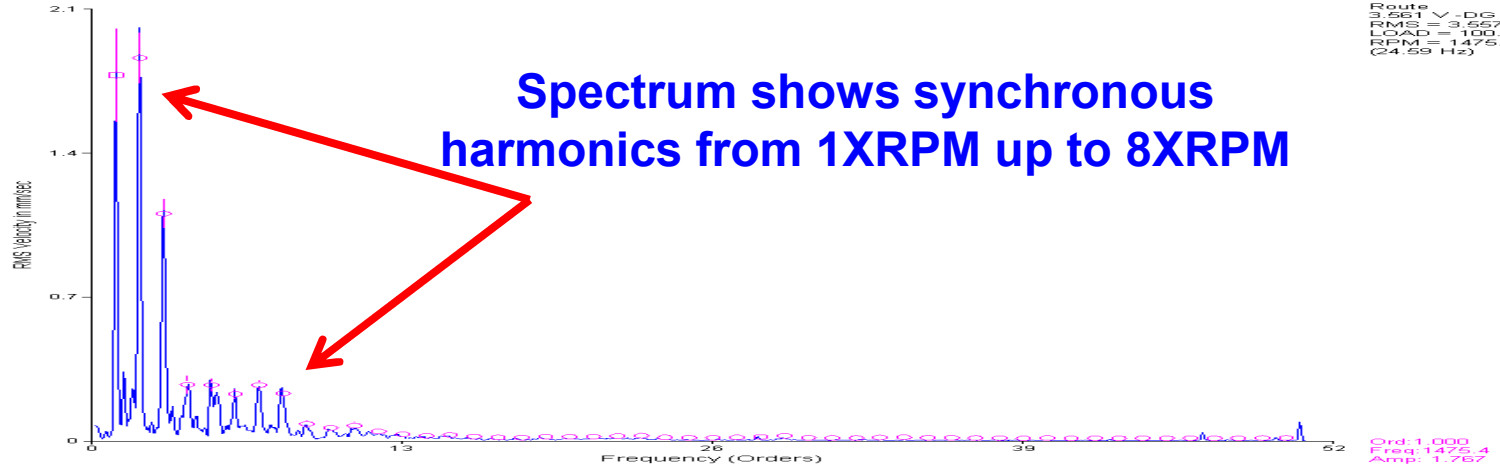
DRAF - DRIERS / 38FANS618M - GAS RECYCLE FAN
1H - MOTOR NDE HORIZONTAL



Multiple Spectrum History Plot- Motor NDE Horiz

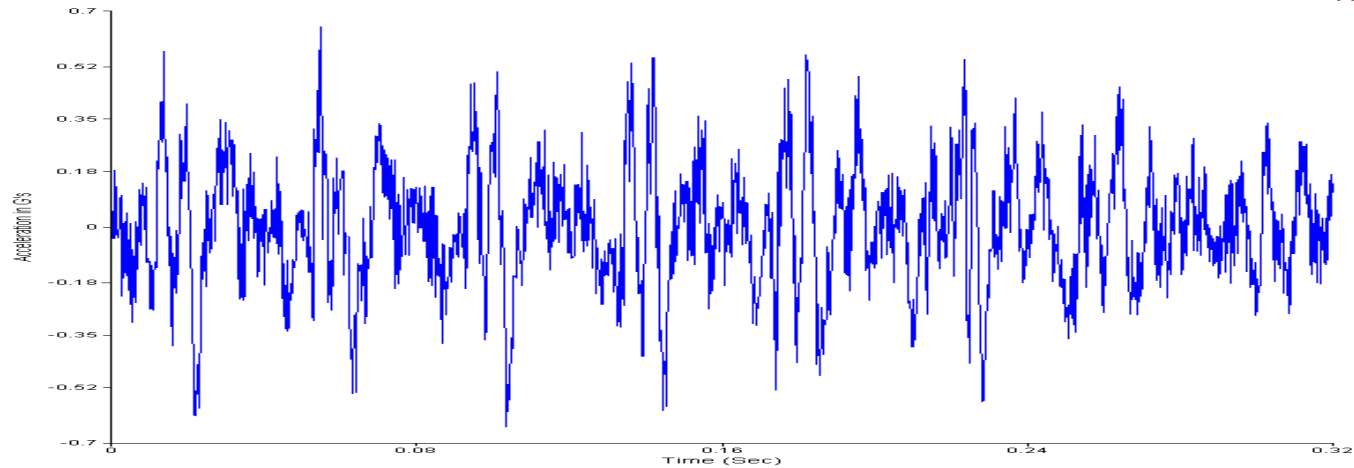
DRAF - DRIERS / 38FANS618M - GAS RECYCLE FAN
1H - MOTOR NDE HORIZONTAL

11/02/2013 11:20:13
Route
3.561 V.DG
RMS = 3.557
LOAD = 100.00
RPM = 1475.4
(24.59 Hz)



DRAF - DRIERS / 38FANS618M - GAS RECYCLE FAN
1H - MOTOR NDE HORIZONTAL

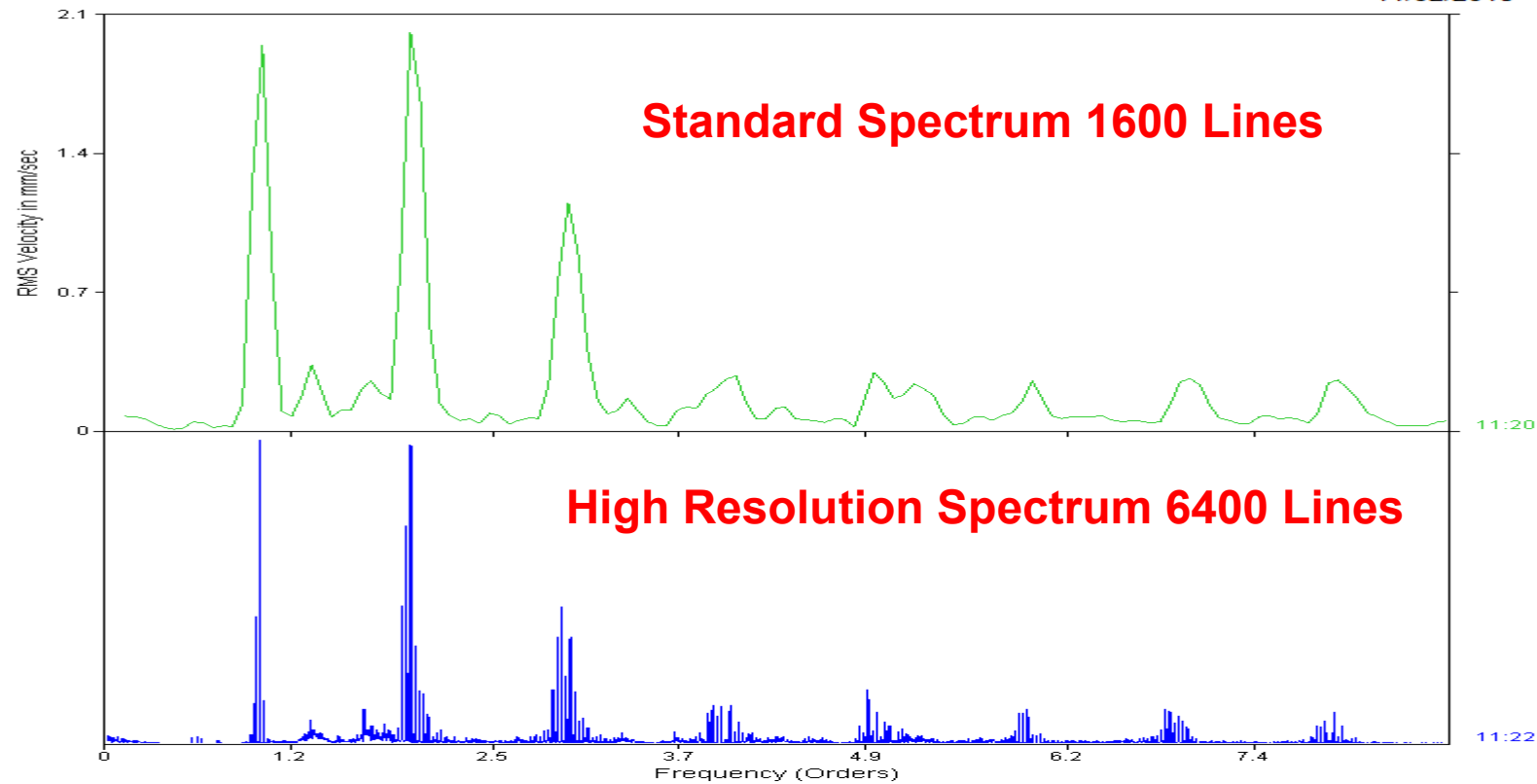
11/02/2013 11:20:13
Route
RPM = 1475.4
(24.59 Hz)
LOAD = 100.00
RMS = 0.199
Pk(+) = 0.650
Pk(-) = 0.643
Crest = 3.271



Spectrum & Waveform - Motor NDE Horiz

DRAF - DRIERS / 38FANS618M - GAS RECYCLE FAN
1H - MOTOR NDE HORIZONTAL

11/02/2013 - Multiple Spectra

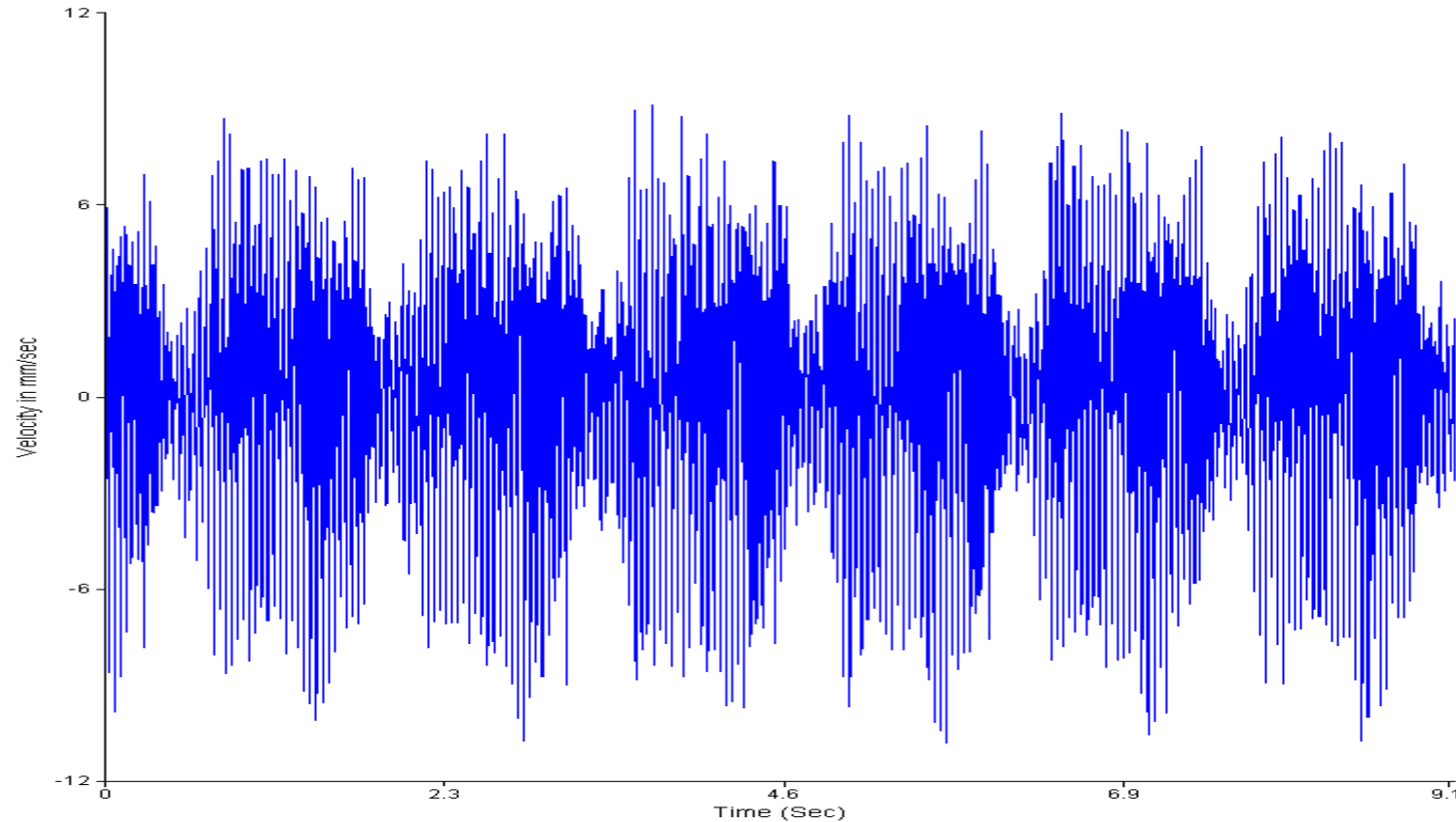


High Resolution 6400 Line spectrum shows clear sidebands surrounding the 1-8 XRPM harmonics

DRAF - DRIERS / 38FANS618M - GAS RECYCLE FAN
1H - MOTOR NDE HORIZONTAL

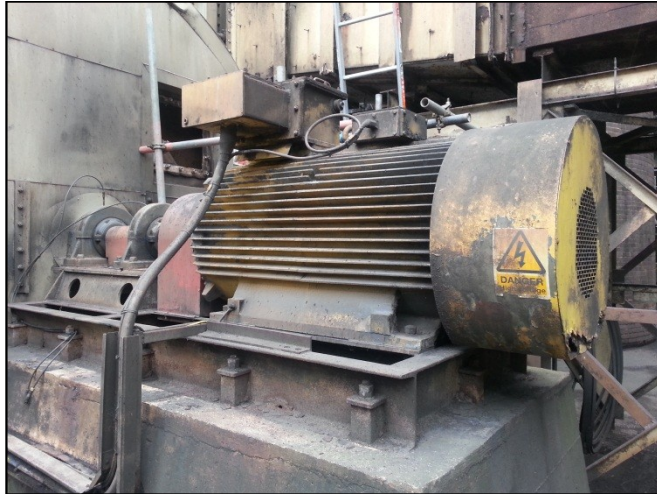
11/02/2013 11:22:32

Analyze
RPM = 1490.5
(24.84 Hz)
LOAD = 100.00
RMS = 3.364
Pk(+) = 9.884
Pk(-) = 11.77
Crest = 3.461



**Extended Time Waveform clearly shows a regular “Beat” is present,
this was also audible.**

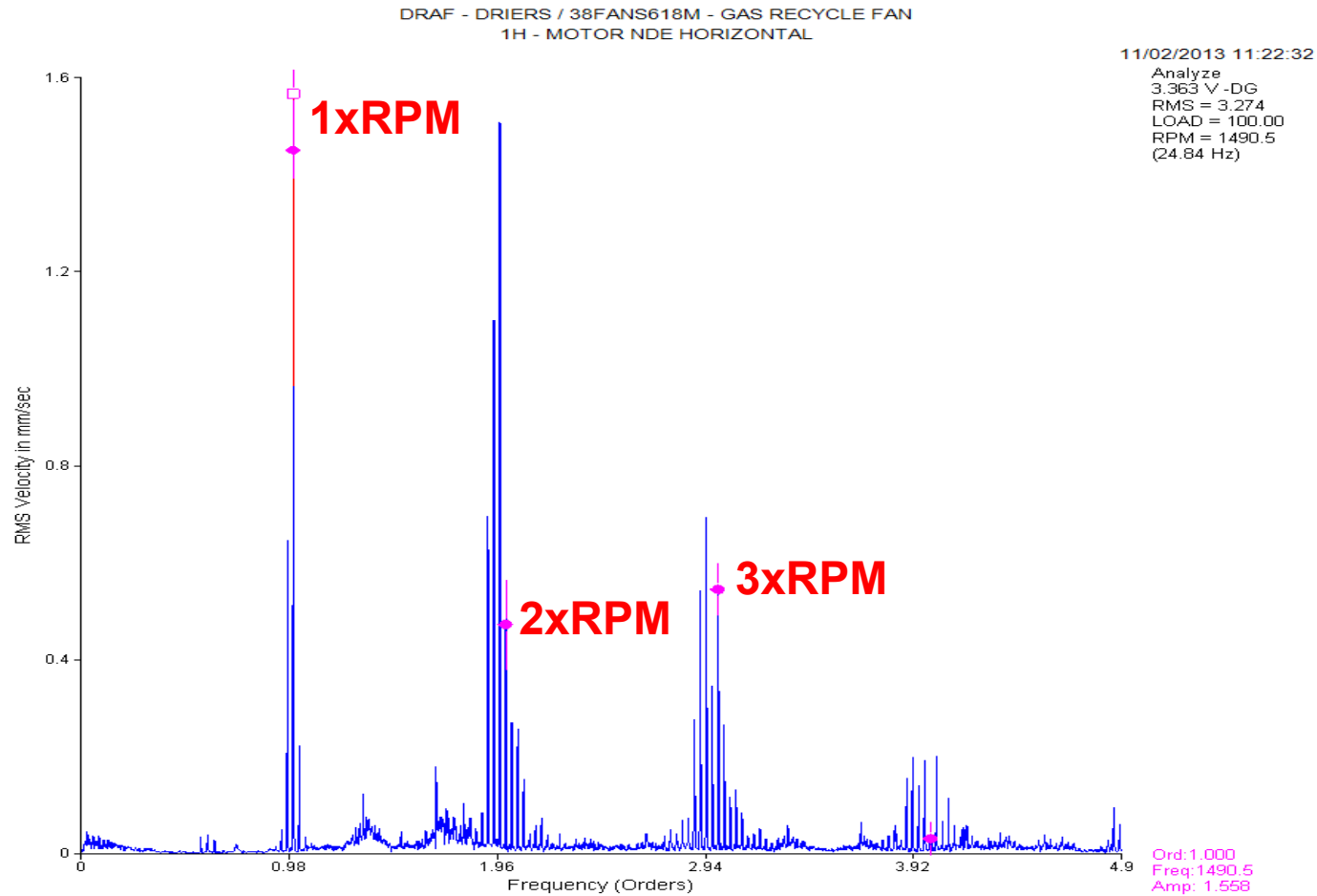
Gas Recycle Fan – Motor Details



- Induction Motor
- Power 315 KW
- 1500 RPM.
- Actual Running Speed 1490 RPM
- 4 Poles
- Rolling Element Bearings

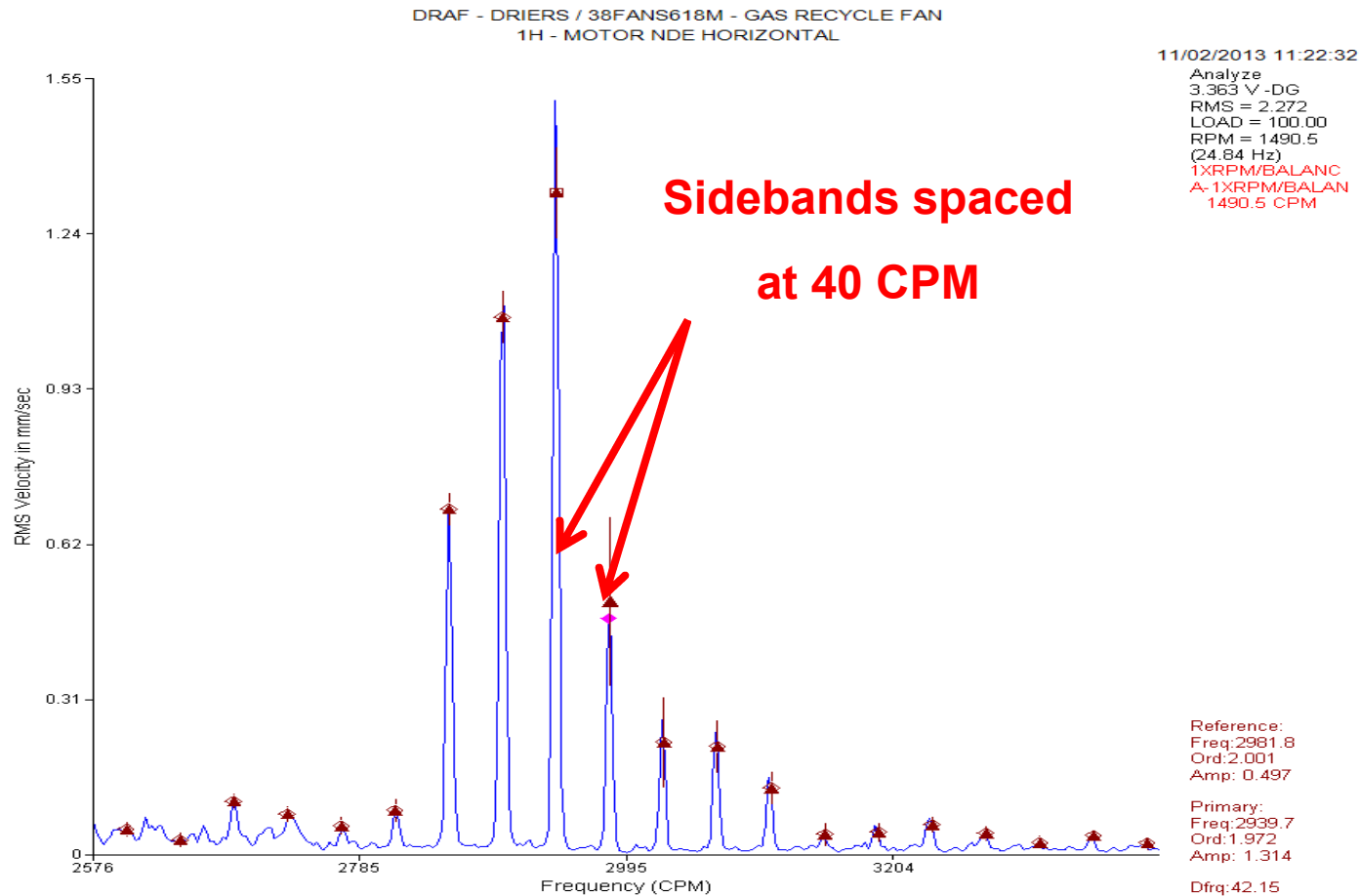


Gas Recycle Fan Motor – Detailed Analysis



High Resolution spectrum shows run speed harmonics surrounded by modulation sidebands

Gas Recycle Fan Motor – Detailed Analysis



Sidebands measured at 40 CPM (Cycles Per Min)

Suspected Rotorbar Problem

Gas Recycle Fan Motor – Detailed Analysis

Rotorbar Defect Freq = No. of Poles x Slip Frequency

1500 RPM – 1490 RPM = **10 CPM Slip Frequency**

4 Poles x 10 CPM Slip Freq = **40 Cycles Per Min**

40 Cycles per min matches the spacing of the modulation sidebands surrounding the 1xRPM harmonics. This is also the frequency of the “Beat”



Conclusion :

Rotorbar Defects Present on Motor



Upon Inspection - Rotobar found to be cracked