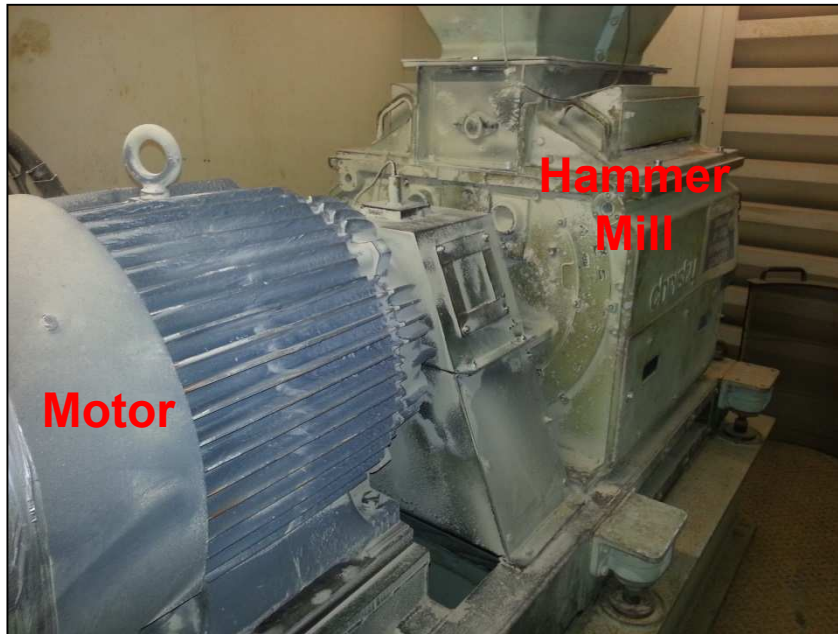


Case Study – Vibration Analysis



Hammer Mill – Motor Bearing Damage

Vibration Analysis – Hammer Mill, Motor bearing defect



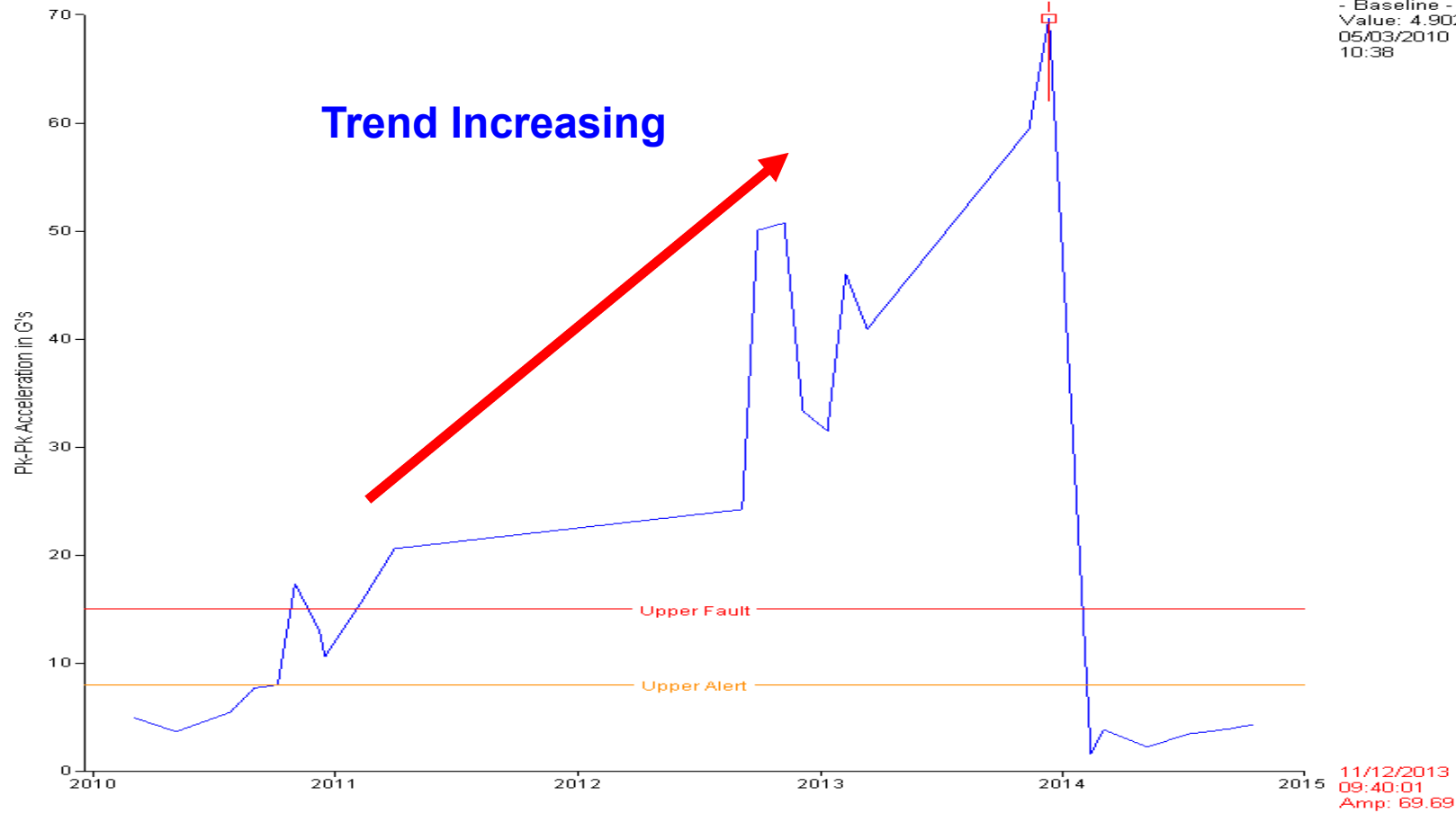
- The Hammer Mill is part of the mashing area on a Bio Ethanol Plant
- It mills wheat in preparation for the Bio-Ethanol Process
- The Motor is inverter driven (Variable Speed)

Monthly Vibration readings are collected and analysed

- Unit was in production from March 2010.

MML - Milling / Mashing & Liquefaction / M209A - Hammer Mill A
MIP - Motor Inboard Peakvue

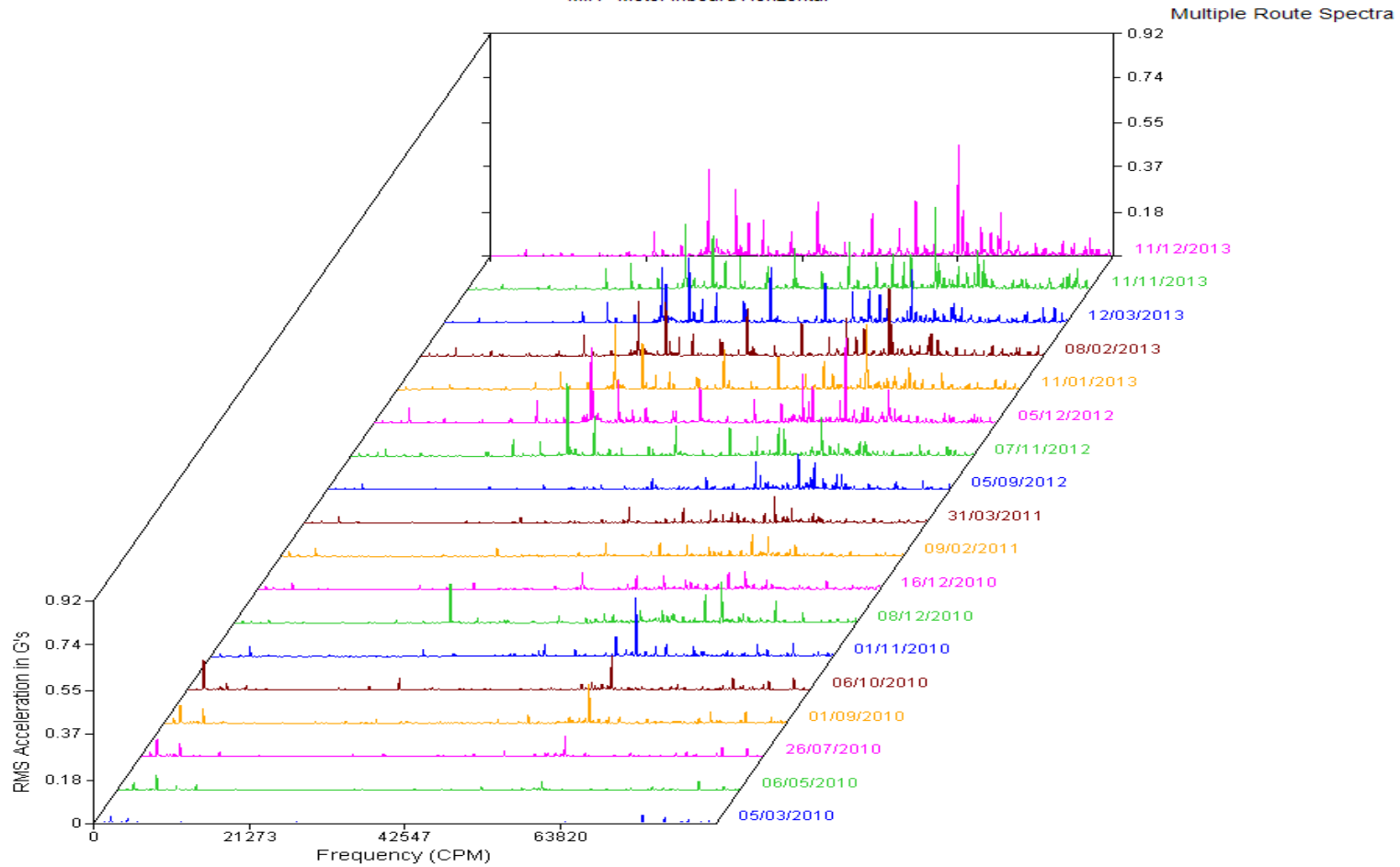
Waveform Pk-Pk
- Baseline -
Value: 4.902
05/03/2010
10:38



Motor DE bearing

Waveform P-P G levels increased since 2010 to 69 G's

MML - Milling / Mashing & Liquefaction / M209A - Hammer Mill A
MIH - Motor Inboard Horizontal

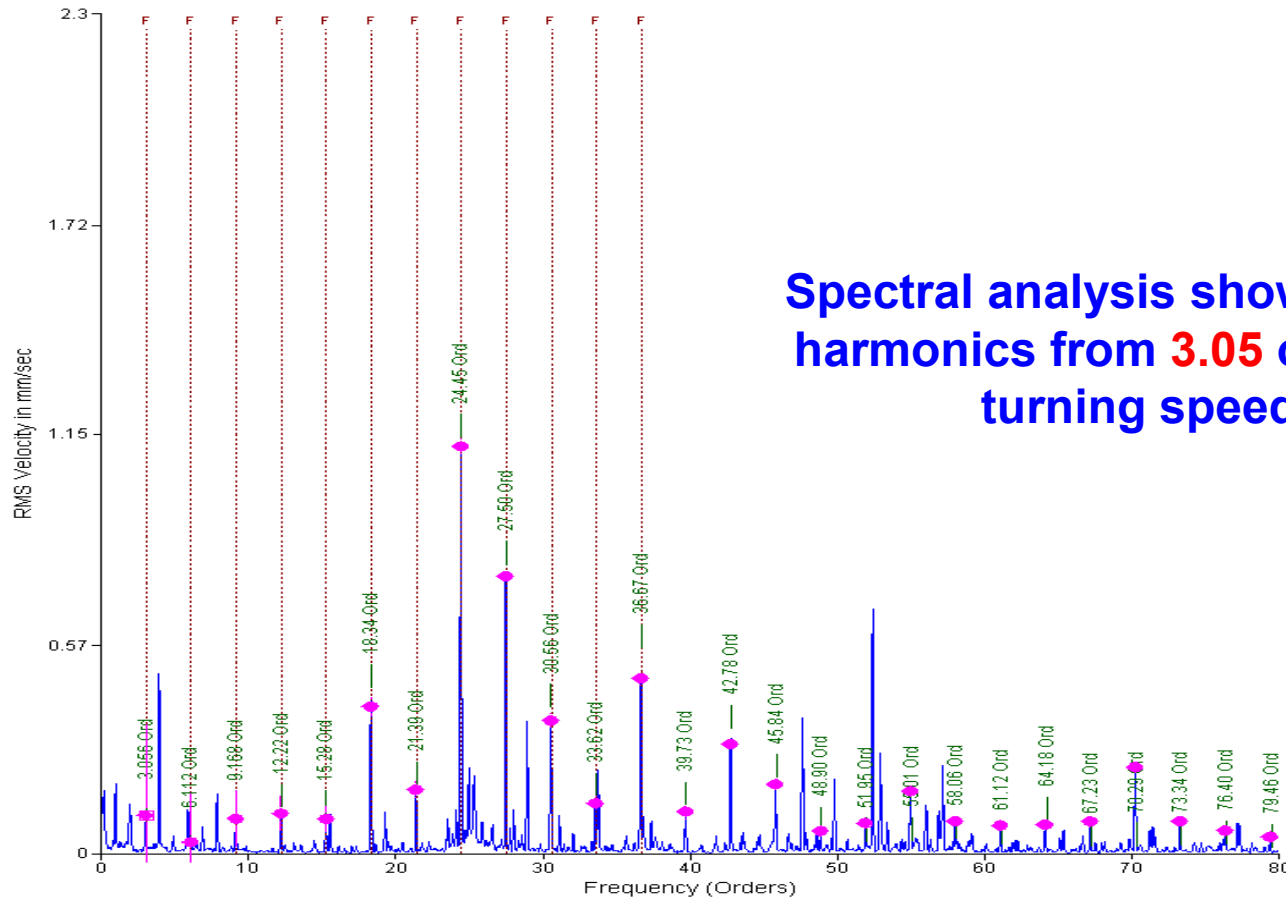


Motor DE bearing & NDE bearing
Increasing activity in spectral data

MML - Milling / Mashing & Liquefaction / M209A - Hammer Mill A
MIH - Motor Inboard Horizontal

11/12/2013 09:40:01

Route
2.247 V -DG
RMS = 2.248
LOAD = 100.00
RPM = 1220.5
(20.34 Hz)
SKF 6322
F-BPFO
3.056 Orders

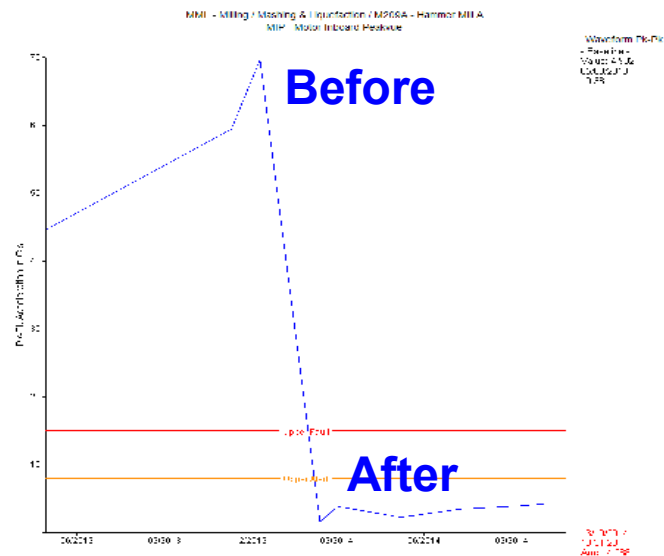
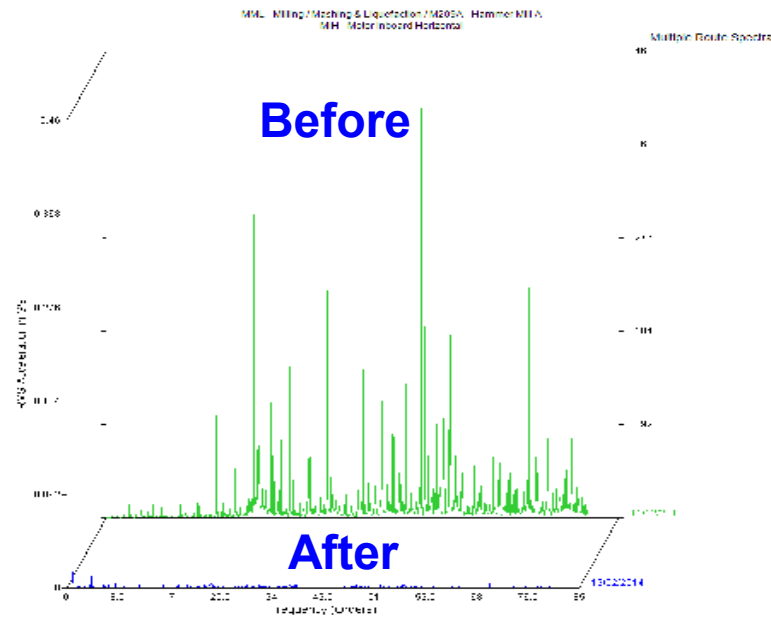


Defect frequency match with SKF 6322 bearing outer race damage (BPFO)



Motor bearings removed for inspection in early 2014

Clear damage on outer race indicating electrical erosion as root cause of bearing damage



•Appearance

Both motor bearings show severe fluting on outer races, damage also present on inner races, balls discoloured

•Cause

Stray eddy currents causing electrical erosion of the bearings

•Action

Fitted insulated bearing to the NDE of the motor as cure.