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1st Apr 2011

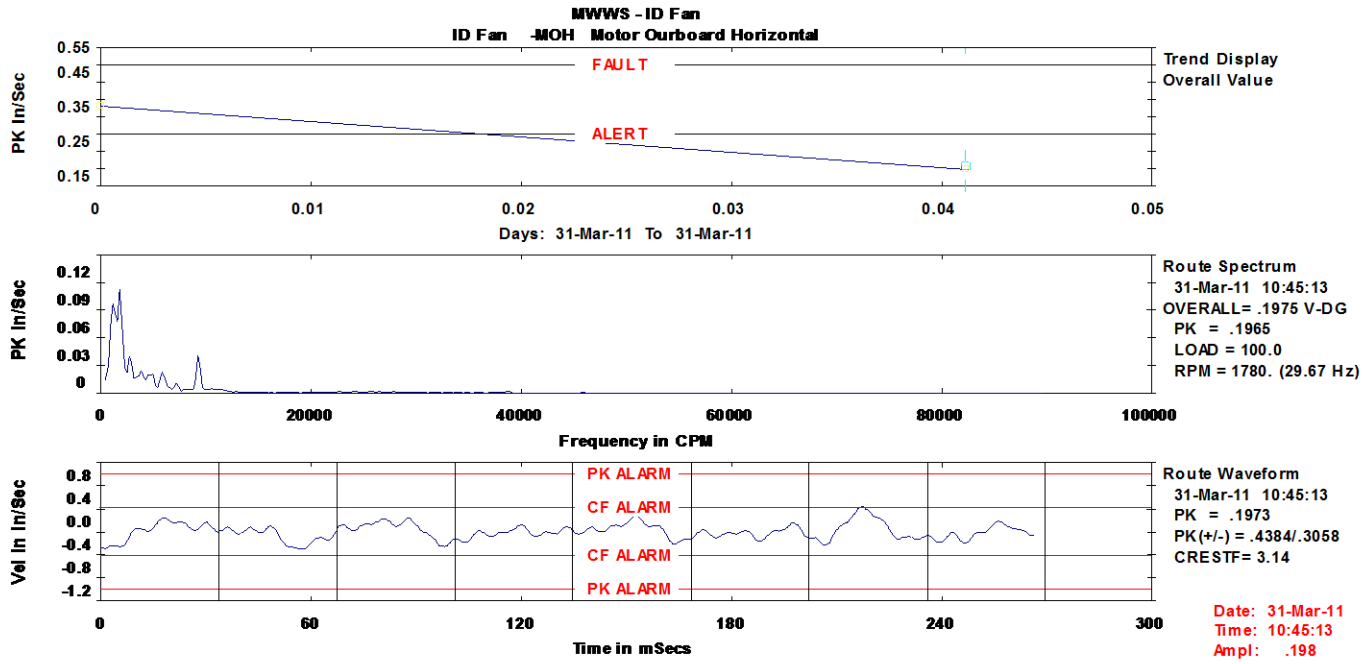
Att: XXXXXX

Millar Western Sawmill (Whitecourt)
Fan Balancing & Vibration Analysis Report

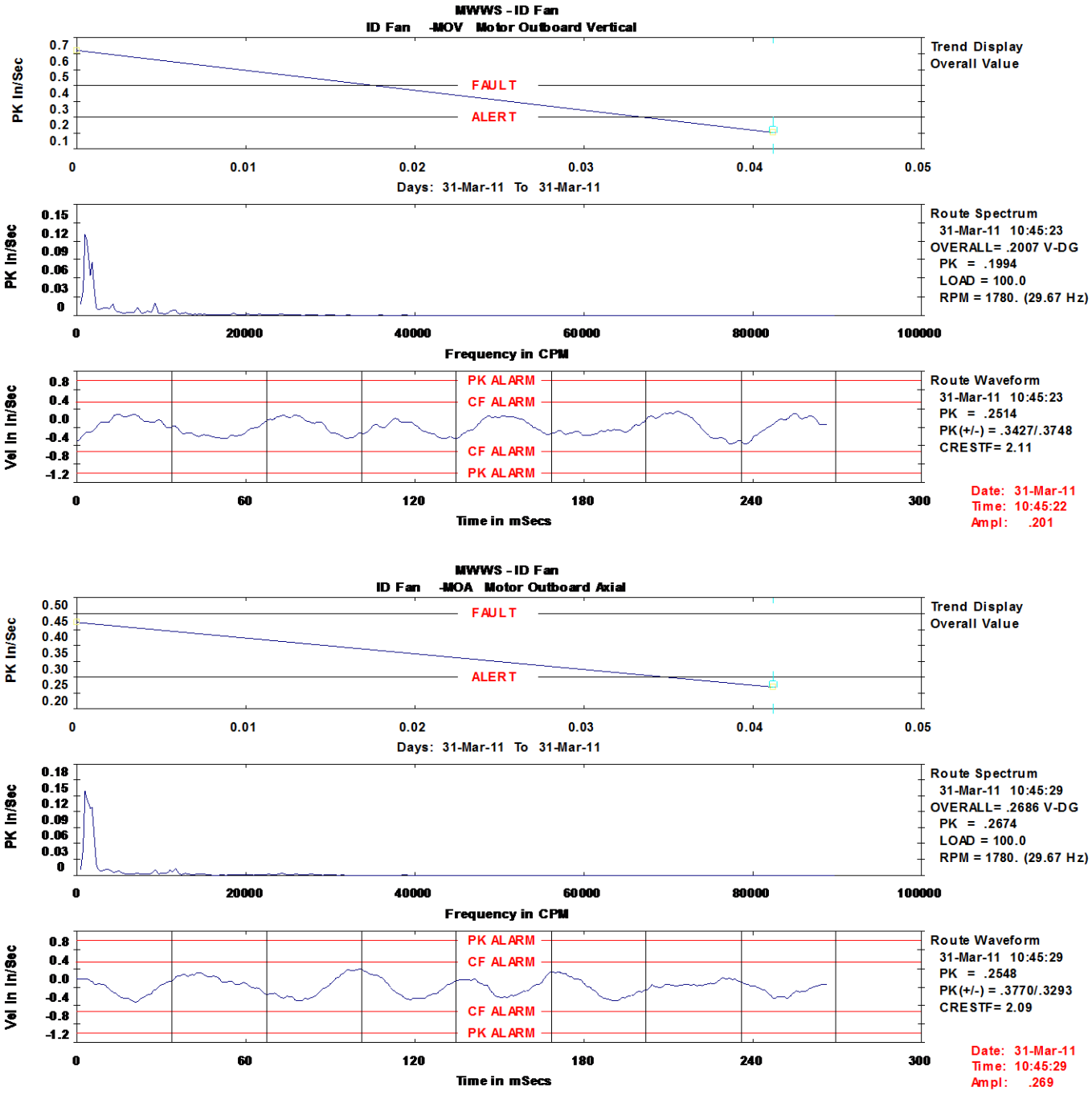
Hi Ron,

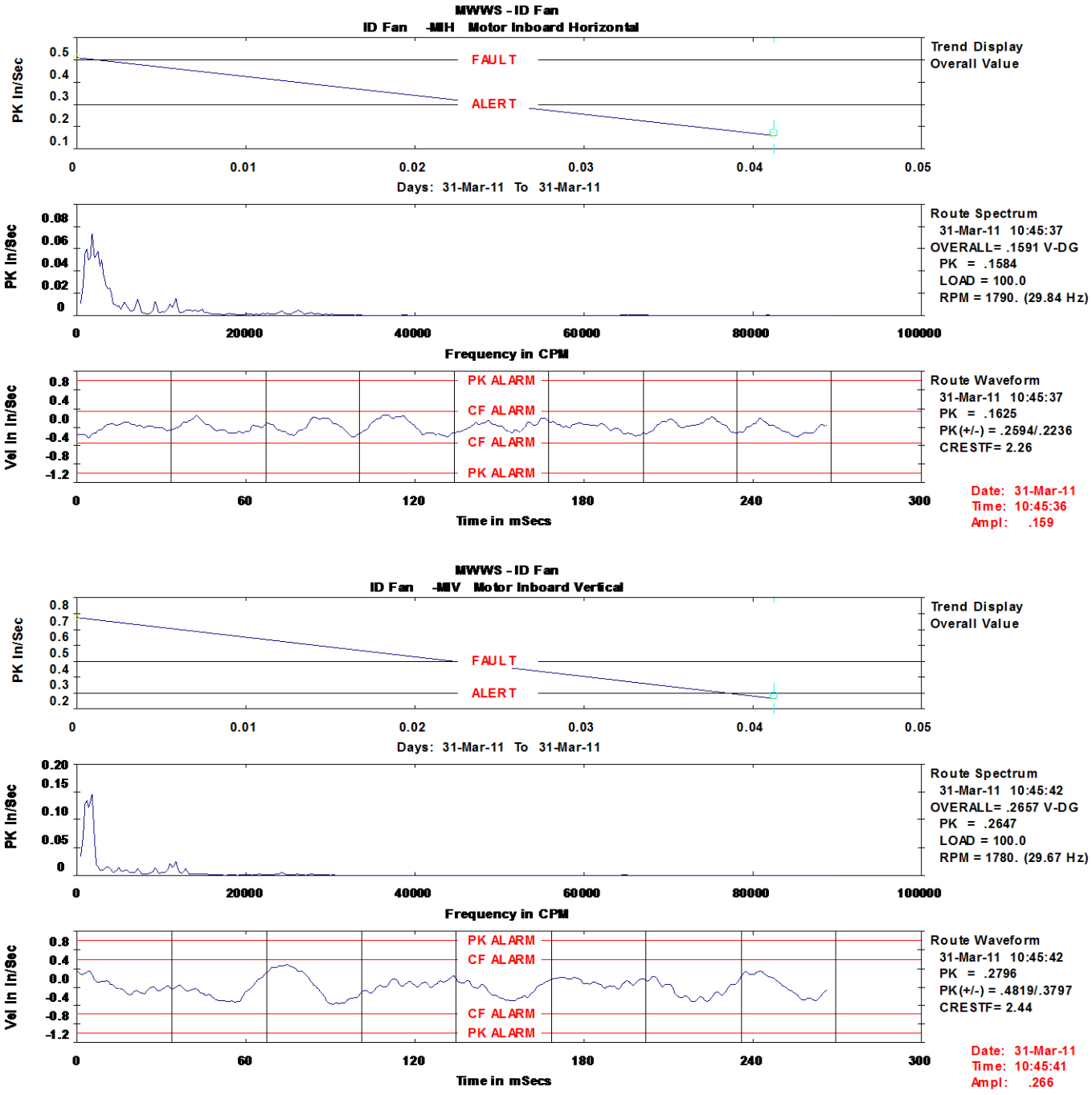
Vibration levels attributed to the unbalanced fan have been reduced from 4.29 mils inboard / 3.22 mils outboard to 0.047 mils inboard and 1.1 mils outboard (measurements taken in the horizontal axis). When measured in velocity, vibration levels @ 1 X operating rpm were 0.068 peak in/sec inboard and 0.079 peak in/sec outboard, well within ISO 10816-1:1995 guidelines (see see plots and chart below). This machine would be classified as a category IV machine because of the light-weight foundations.
The highest points of vibration are normally found in the horizontal axis; however, the poor/flimsy foundation amplified vertical vibration amplitudes on this machine.
The fan is now running at "acceptable" levels, however if any major work is to be carried out on the fan it would be prudent to consider stiffening the foundations, this would dramatically reduce the remaining vibration amplitudes and increase bearing life.

Trend plots show "before and after" overall vibration amplitudes.

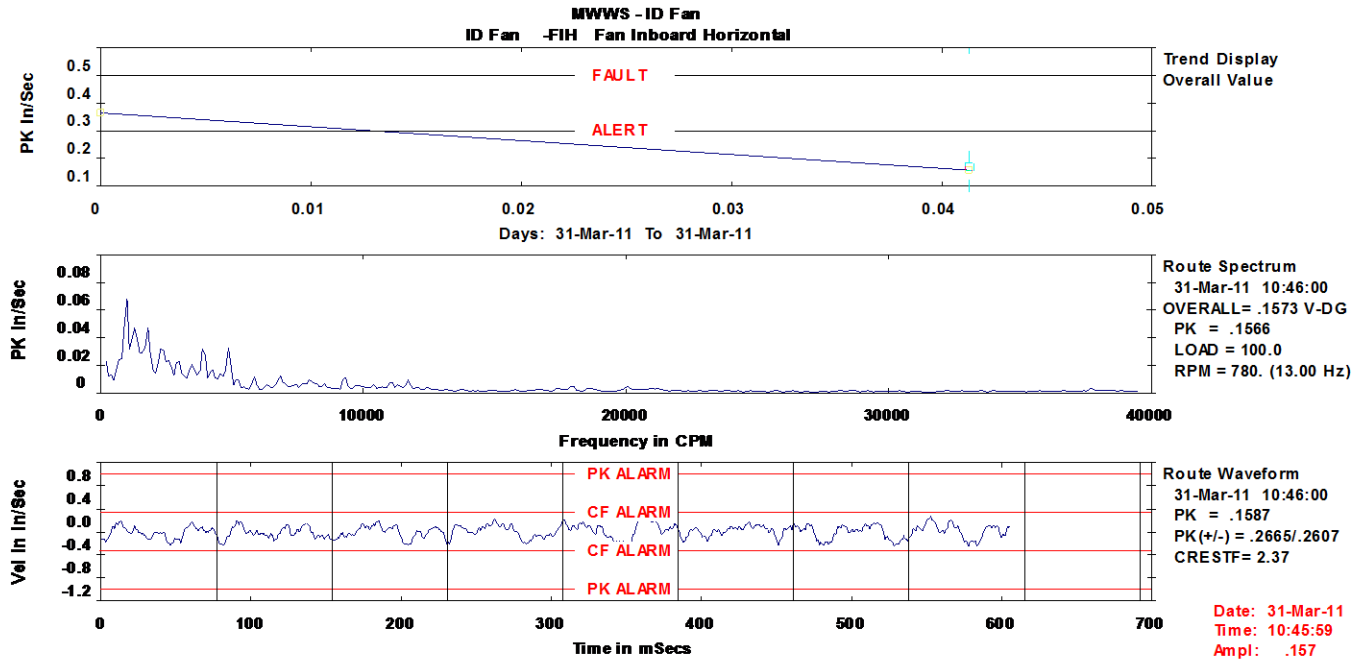


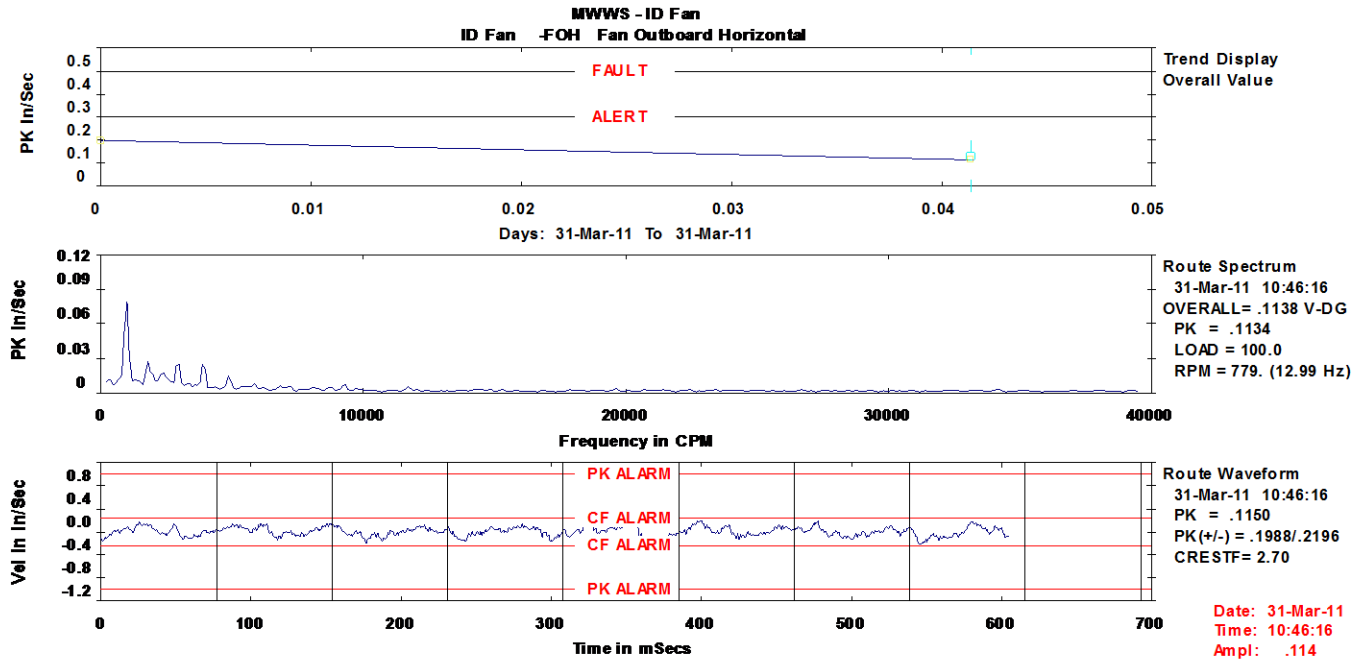
The highest level of vibration was initially found on the motor (outboard - vertical axis), the reason for this is the flimsy foundation, allowing the forces in the unbalanced fan to resonate through to the motor.

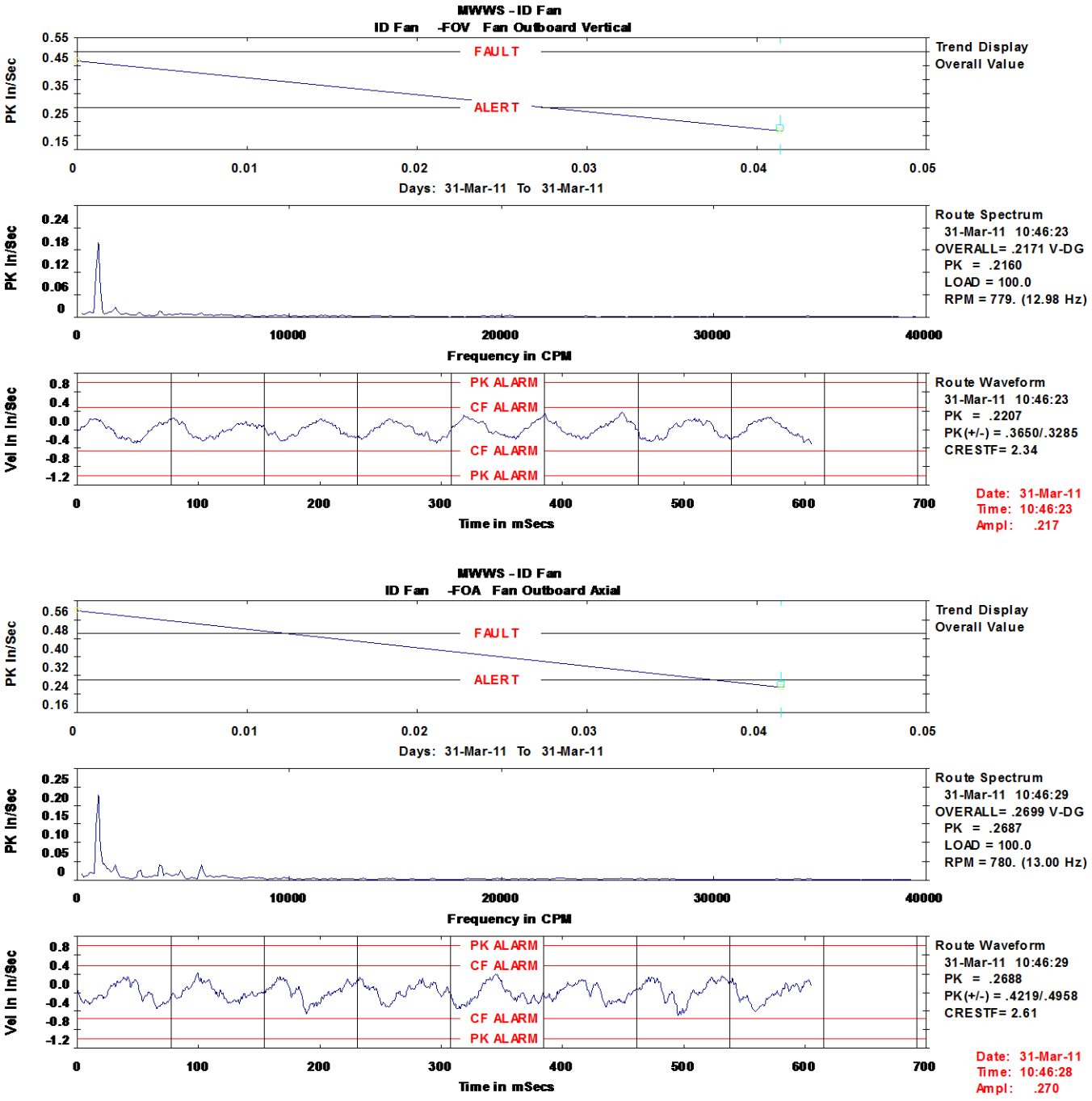

MWWS - ID Fan
ID Fan -MOV Motor Outboard Vertical
PK In/Sec
FAULT
ALERT
Trend Display
Overall Value
Days: 31-Mar-11 To 31-Mar-11
Route Spectrum
31-Mar-11 10:45:23
OVERALL= .2007 V-DG
PK = .1994
LOAD = 100.0
RPM = 1780. (29.67 Hz)
Frequency in CPM
Vel In In/Sec
PK ALARM
CF ALARM
Route Waveform
31-Mar-11 10:45:23
PK = .2514
PK(+/-) = .3427/.3748
CRESTF= 2.11
Date: 31-Mar-11
Time: 10:45:22
Ampl: .201
Time in mSecs
MWWS - ID Fan
ID Fan -MOA Motor Outboard Axial
Trend Display
Overall Value
Route Spectrum
31-Mar-11 10:45:29
OVERALL= .2686 V-DG
PK = .2674
LOAD = 100.0
RPM = 1780. (29.67 Hz)
Route Waveform
31-Mar-11 10:45:29
PK = .2548
PK(+/-) = .3770/.3293
CRESTF= 2.09
Date: 31-Mar-11
Time: 10:45:29
Ampl: .269

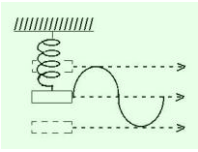

MWWS - ID Fan
ID Fan -MH Motor Inboard Horizontal
PK In/Sec
FAULT
ALERT
Trend Display
Overall Value
Days: 31-Mar-11 To 31-Mar-11
Route Spectrum
31-Mar-11 10:45:37
OVERALL= .1591 V-DG
PK = .1584
LOAD = 100.0
RPM = 1790. (29.84 Hz)
Frequency in CPM
Vel In In/Sec
PK ALARM
CF ALARM
CF ALARM
PK ALARM
Route Waveform
31-Mar-11 10:45:37
PK = .1625
PK(+/-) = .2594/.2236
CRESTF= 2.26
Time in mSecs
Date: 31-Mar-11
Time: 10:45:36
Ampl: .159
MWWS - ID Fan
ID Fan -MV Motor Inboard Vertical
PK In/Sec
FAULT
ALERT
Trend Display
Overall Value
Days: 31-Mar-11 To 31-Mar-11
Route Spectrum
31-Mar-11 10:45:42
OVERALL= .2657 V-DG
PK = .2647
LOAD = 100.0
RPM = 1780. (29.67 Hz)
Frequency in CPM
Vel In In/Sec
PK ALARM
CF ALARM
CF ALARM
PK ALARM
Route Waveform
31-Mar-11 10:45:42
PK = .2796
PK(+/-) = .4819/.3797
CRESTF= 2.44
Time in mSecs
Date: 31-Mar-11
Time: 10:45:41
Ampl: .266

Note the waveform in the lower half of the plot, it is not purely sinusoidal; this confirms that the remaining vibration amplitudes are not related to balance quality.






MWWS - ID Fan
ID Fan -FOV Fan Outboard Vertical
PK In/Sec
FAULT
ALERT
Trend Display
Overall Value
Days: 31-Mar-11 To 31-Mar-11
Route Spectrum
31-Mar-11 10:46:23
OVERALL= .2171 V-DG
PK = .2160
LOAD = 100.0
RPM = 779. (12.98 Hz)
Frequency in CPM
Vel In In/Sec
PK ALARM
CF ALARM
Route Waveform
31-Mar-11 10:46:23
PK = .2207
PK(+/-) = .3650/.3285
CRESTF= 2.34
Time in mSecs
Date: 31-Mar-11
Time: 10:46:23
Ampl: .217
MWWS - ID Fan
ID Fan -FOA Fan Outboard Axial
Trend Display
Overall Value
Route Spectrum
31-Mar-11 10:46:29
OVERALL= .2699 V-DG
PK = .2687
LOAD = 100.0
RPM = 780. (13.00 Hz)
Route Waveform
31-Mar-11 10:46:29
PK = .2688
PK(+/-) = .4219/.4958
CRESTF= 2.61
Date: 31-Mar-11
Time: 10:46:28
Ampl: .270



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General Machine Vibration Condition Chart

RMS Vibration Velocity		Peak Vibration Velocity		Class I	Class II	Class III	Class IV
mm/sec	In/sec	mm/sec	In/sec				
0.28	0.011	0.395	0.015	A	A	A	A
0.45	0.017	0.636	0.025				
0.71	0.028	1.00	0.039				
1.12	0.044	1.58	0.062	B			
1.8	0.070	2.55	0.100		B		
2.8	0.110	3.96	0.155	C		B	
4.5	0.177	6.36	0.250		C		B
7.1	0.279	10.04	0.395	D		C	
11.2	0.440	15.84	0.623		D		C
18	0.708	25.45	1.00			D	
28	1.100	39.59	1.56				D
45	1.77	63.63	2.51				

A – Good, B – Acceptable, C – Monitor Closely, D - Unacceptable

Class I – Electric motors up to15 KW

Class II – Medium sized machines (15 – 75 KW electric motors)

Class III – > 75 KW Large prime movers on heavy, rigid foundations

Class IV – > 75KW Large prime movers on relatively soft, lightweight foundations

I trust that the above is in line with your requirements but if you have any further questions, please do not hesitate to contact me.

Regards: Rob
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