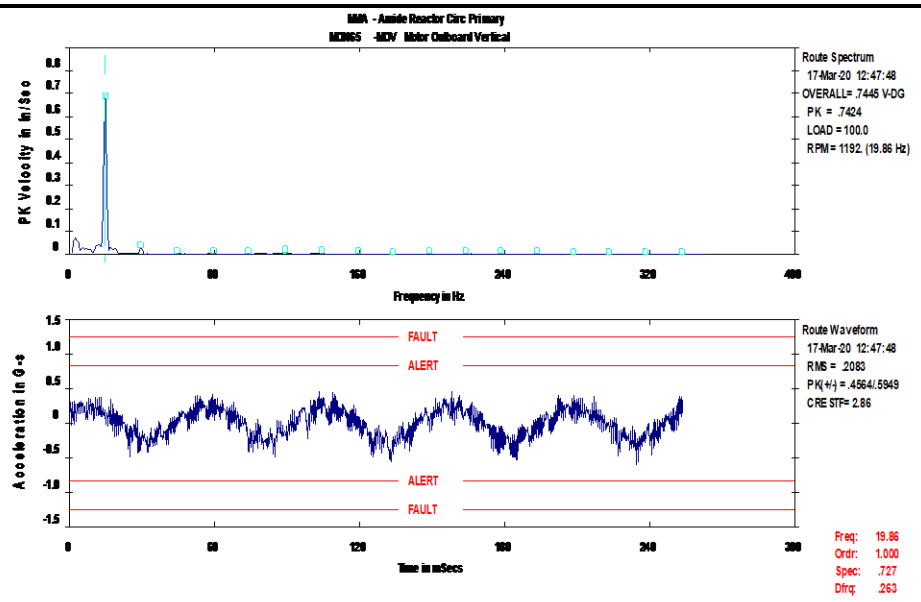
HI-SPEED PREDICTIVE MAINTENANCE

Machinery Vibration Report

Client	Lucite	**Survey Date**	3-17-20
Location	Memphis, TN	**Report Date**	3-18-20
Machine	Amide Reactor Circulation Primary MON65	**QMS No.**	142104
Component	Motor	**Analyst**	DWS

Defect Rating for this machine	**Class III**
Defect Rating System	
Class I: Defect is present, but effect on reliability is not clear; no immediate action is required. Continue normal monitoring.	**Class III;** Defect (s) present that may cause failure in short term (less than 2 mos.). Should be addressed as soon as practical, with a high maintenance priority. Increase monitoring frequency.
Class II: Defect (s) present that may cause problem in long term (2-6 mos.). Repair during normal maintenance scheduling. Continue to monitor.	**Class IV;** Defect (s) present that makes continued reliability unpredictable, and possibility of secondary damage is high. ***Repairs should be made ASAP. An unscheduled shutdown should be considered for repairs.***

Vibration Data



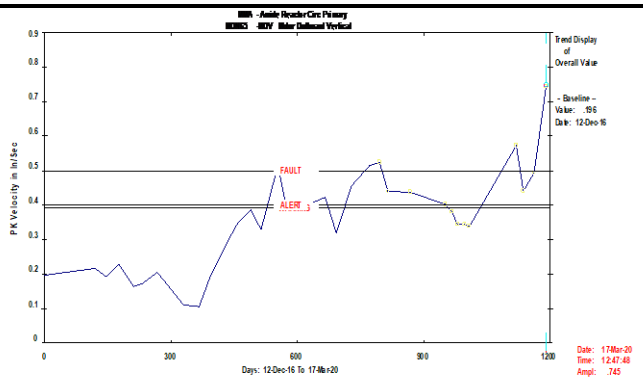
Analysis

Dominant shaft speed vibration with high frequency modulation.

Discussion / Repair recommendations

The motor has a large directional or torsional vibration indicating excessive vertical movement. Inspect all fasteners for tightness and the unit base for weakness/flexing. Check the coupling and alignment also. **Rated a Class III Defect.**

Trend Data



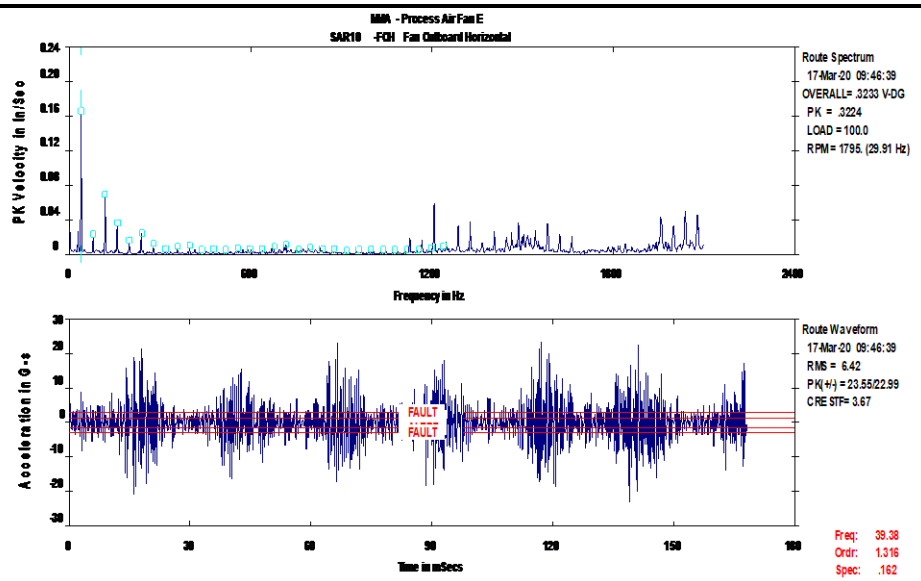
HI-SPEED PREDICTIVE MAINTENANCE

Machinery Vibration Report

Client	Lucite	**Survey Date**	3-17-20
Location	Memphis, TN	**Report Date**	3-18-20
Machine	Process Air Fan E SAR 10	**QMS No.**	142104
Component	Fan Bearings	**Analyst**	DWS

Defect Rating for this machine	**Class IV**
Defect Rating System	
Class I: Defect is present, but effect on reliability is not clear; no immediate action is required. Continue normal monitoring.	**Class III;** Defect (s) present that may cause failure in short term (less than 2 mos.). Should be addressed as soon as practical, with a high maintenance priority. Increase monitoring frequency.
Class II: Defect (s) present that may cause problem in long term (2-6 mos.). Repair during normal maintenance scheduling. Continue to monitor.	**Class IV;** Defect (s) present that makes continued reliability unpredictable, and possibility of secondary damage is high. ***Repairs should be made ASAP. An unscheduled shutdown should be considered for repairs.***

Vibration Data



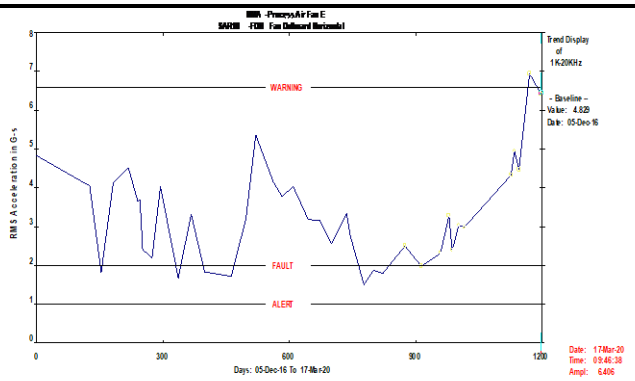
Analysis

Pulsing in the time domain of the outboard bearing at shaft speed.

Discussion / Repair recommendations

The fan bearings are most likely in distress. Pulsing at shaft speed can indicate at least one bad area on the bearing race. Suspect an issue during repairs at big shutdown. Make sure fan wheel is not rubbing on the housing. Did you float one of the bearings? Normally we float the outboard bearing (the one closest to the fan wheel, opposite the pulley or coupling). **Rated a Class IV Defect due to the high acceleration.**

Trend Data



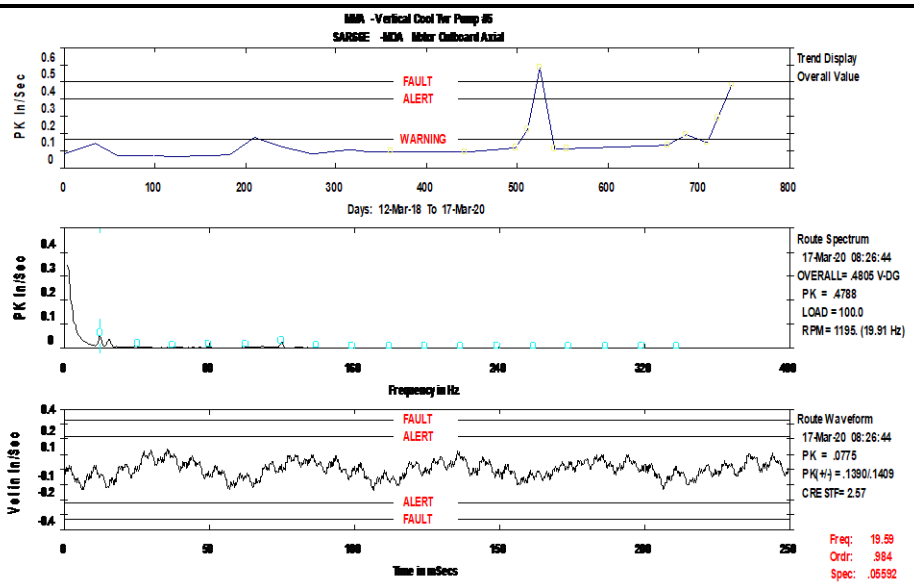
HI-SPEED PREDICTIVE MAINTENANCE

Machinery Vibration Report

Client	Lucite	**Survey Date**	3-17-20
Location	Memphis, TN	**Report Date**	3-18-20
Machine	Vertical Cooling Tower Pump 5 SAR66E	**QMS No.**	142104
Component		**Analyst**	DWS

Defect Rating for this machine	**NA**
Defect Rating System	
Class I: Defect is present, but effect on reliability is not clear; no immediate action is required. Continue normal monitoring.	**Class III;** Defect (s) present that may cause failure in short term (less than 2 mos.). Should be addressed as soon as practical, with a high maintenance priority. Increase monitoring frequency.
Class II: Defect (s) present that may cause problem in long term (2-6 mos.). Repair during normal maintenance scheduling. Continue to monitor.	**Class IV;** Defect (s) present that makes continued reliability unpredictable, and possibility of secondary damage is high. ***Repairs should be made ASAP. An unscheduled shutdown should be considered for repairs.***

Vibration Data



Analysis

Bad reading.

Discussion / Repair recommendations

The ski slope on the left side of the spectrum is almost always an indicator of a bad reading. Overwrite the data when this happens. Note the trend is high without strong vibrations in the time domain.

Information only

Trend Data

See above

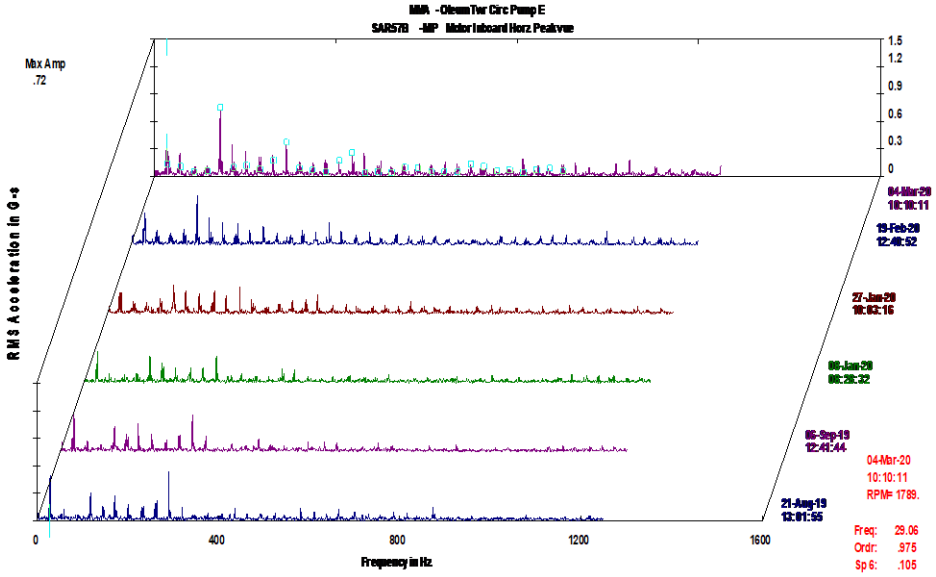
HI-SPEED PREDICTIVE MAINTENANCE

Machinery Vibration Report

Client	Lucite	**Survey Date**	3-4-20
Location	Memphis, TN	**Report Date**	3-18-20
Machine	Oleum Tower Circulation Pump B SAR57B	**QMS No.**	142104
Component	Motor Bearings	**Analyst**	DWS

Defect Rating for this machine	**Class II**
Defect Rating System	
Class I: Defect is present, but effect on reliability is not clear; no immediate action is required. Continue normal monitoring.	**Class III;** Defect (s) present that may cause failure in short term (less than 2 mos.). Should be addressed as soon as practical, with a high maintenance priority. Increase monitoring frequency.
Class II: Defect (s) present that may cause problem in long term (2-6 mos.). Repair during normal maintenance scheduling. Continue to monitor.	**Class IV;** Defect (s) present that makes continued reliability unpredictable, and possibility of secondary damage is high. ***Repairs should be made ASAP. An unscheduled shutdown should be considered for repairs.***

Vibration Data



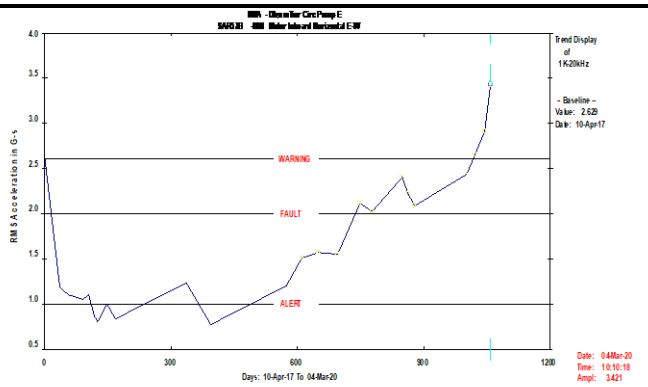
Analysis

Content increase in Peakvue.

Discussion / Repair recommendations

The Peakvue waterfall data indicates increased wear in the bearings. The acceleration trend is getting close to 4g's peak. Expect to change the bearings before the end of the year. **Rated a Class II Defect.**

Trend Data



HI-SPEED PREDICTIVE MAINTENANCE

Machinery Vibration Report

Client	Lucite	**Survey Date**	3-17-20
Location	Memphis, TN	**Report Date**	3-18-20
Machine	ACN29B ACN Cooling Tower Pump M	**QMS No.**	142104
Component	Motor	**Analyst**	DWS

Defect Rating for this machine	**Class II**
Defect Rating System	
Class I: Defect is present, but effect on reliability is not clear; no immediate action is required. Continue normal monitoring.	**Class III;** Defect (s) present that may cause failure in short term (less than 2 mos.). Should be addressed as soon as practical, with a high maintenance priority. Increase monitoring frequency.
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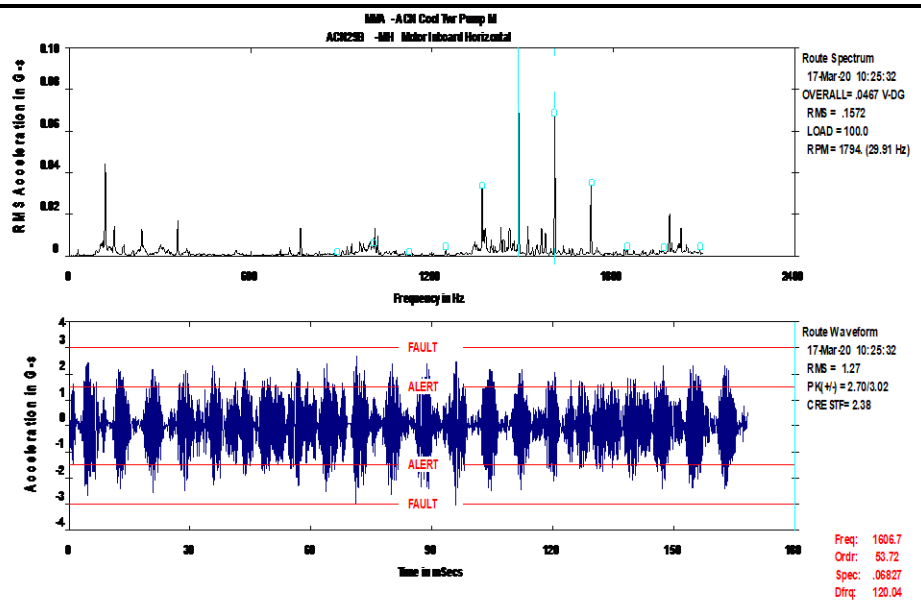
Vibration Data



Analysis

Sidebands and pulsing at near 120 HZ. Modulation frequency is above our F max at near 3KHz.

Discussion / Repair recommendations

There appears to be electrical, rotor bar and possibly bearing issues in the motor. The main vibration is above the Spectrum F max. Check the electrical connections, current and voltage and all fasteners as time allows. We will have to raise the F max to help better understand what is going on here. **Rated a Class II Defect for now.**

Trend Data