HI-SPEED INDUSTRIAL SERVICE QualiTest® Diagnostics

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May 17, 2023

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The following is a summary of findings from the May 2023 WEEK 2 vibration survey at the H2O2 Plant that was performed on May 15th, 2023.

QualiTest® uses a four step rating system for defects.

CLASS I: Defect is present, but effect on reliability is not clear; no immediate action is required. Continue to normally monitor.

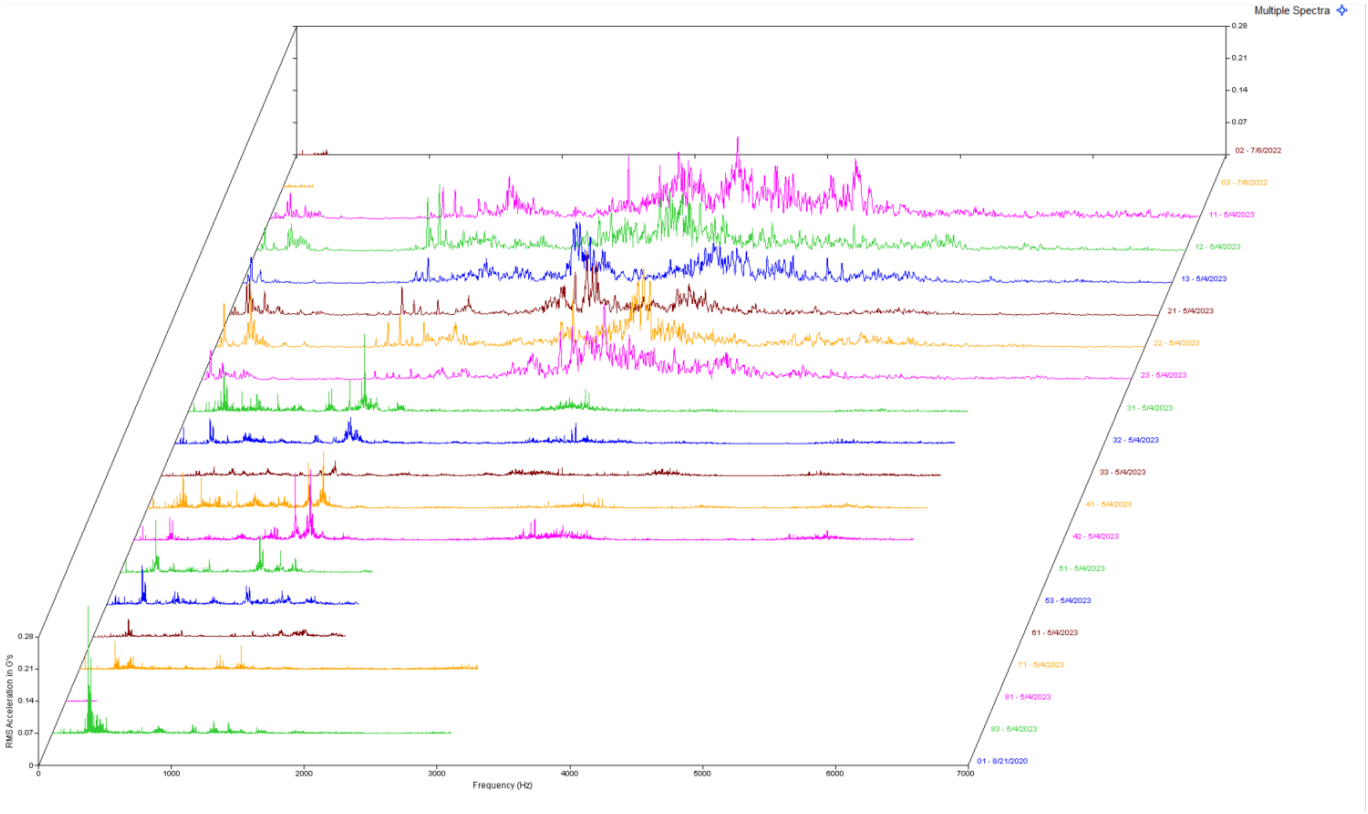
CLASS II: Defect (s) present that may cause problem in long term (2-6 months). Repair during normal maintenance scheduling. Continue to monitor.

CLASS III; Defect (s) present that may cause failure in short term (less than 2 months). This should be addressed as soon as practical, with a high maintenance priority. Increase monitoring frequency.

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

Defect Summary

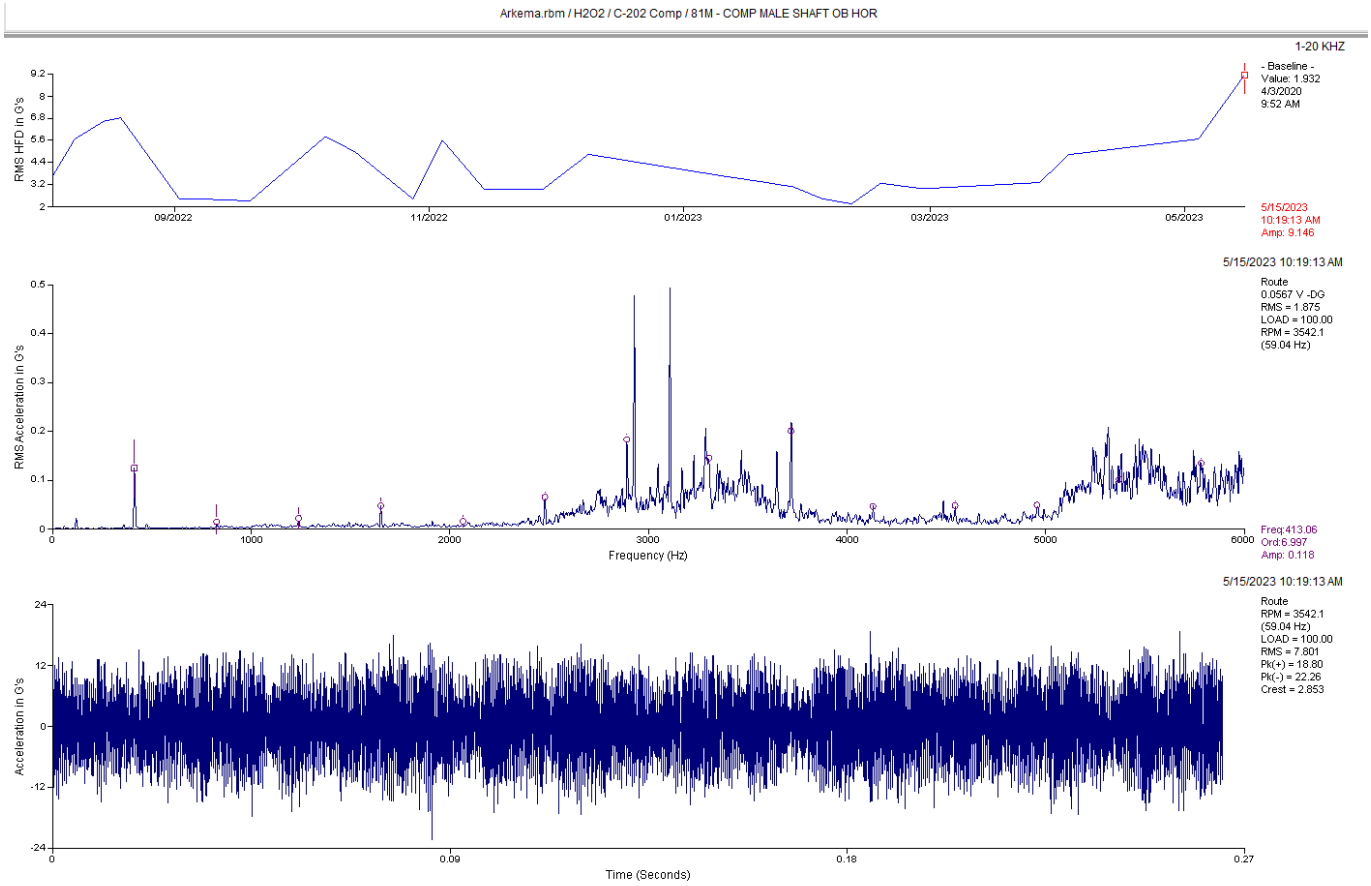
Agitator, Hydrogenator C CLASS II



Observation:
Data above is a multipoint spectral waterfall. Notice the noise floor in the motor data. Data points labeled 11-23.

Recommendation:
Motor data suggests a possible lubrication issue in the motor. For now, it is recommended that the motor has an adequate amount of grease.

C 202 Compressor CLASS I



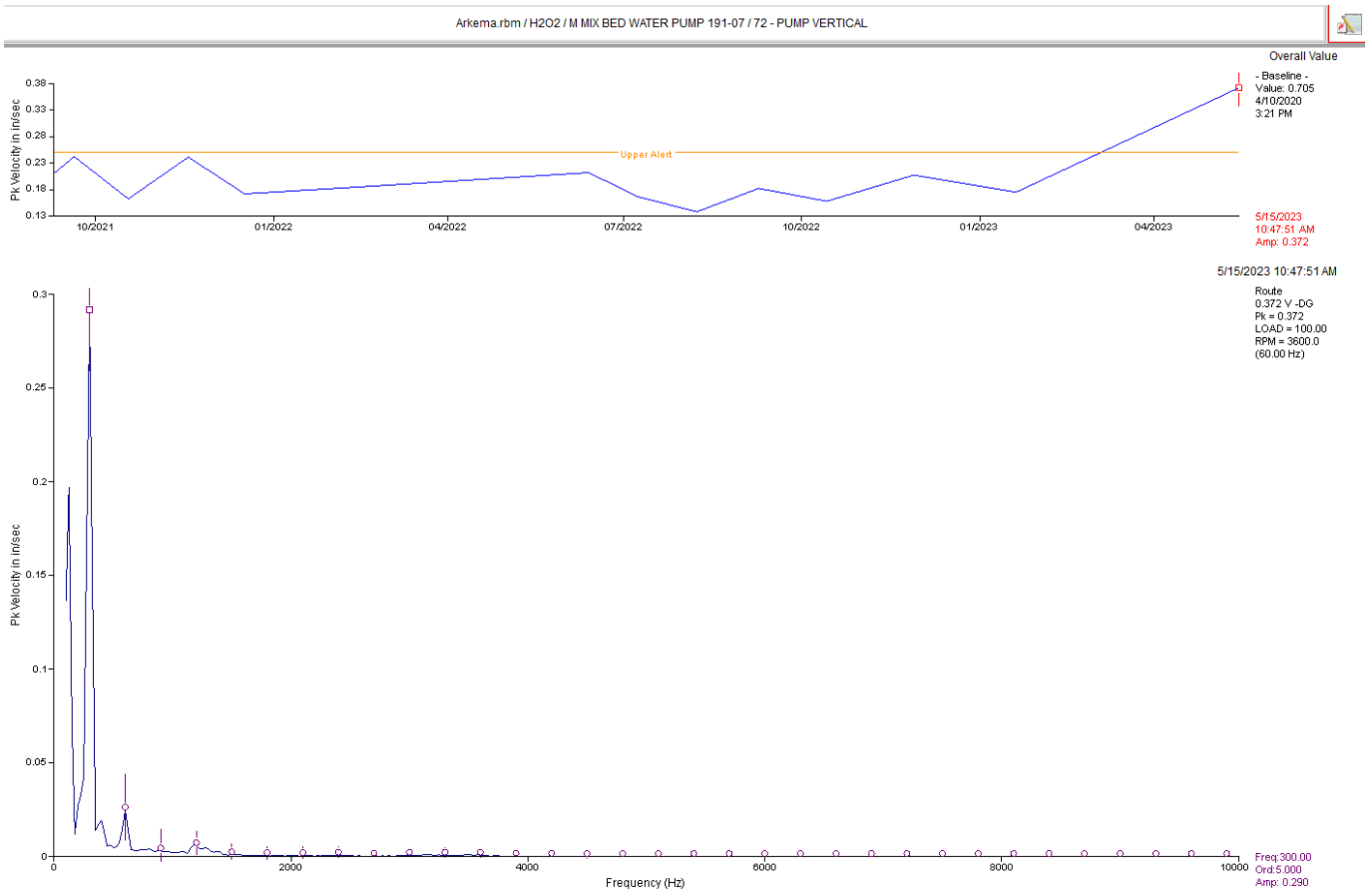
Observation:

Overall vibration has increased this survey in the compressor male section. Femail section is lower this survey compared to last week. Harmonics seen in spectral data above show a fundamental frequency at 413.Hz. This peak may be an output rpm harmonic. This may be due to heavy load on the air end during data acquisition but could also be signs of internal compressor issue or gear pump issue. For now, we will monitor this compressor closely each week.

Recommendation:

Inspect compressor load and ensure compressor is operating under normal parameters.

191-07 Middle Mix Bed Water Pump CLASS II



Observation:

Spectral data above shows a high 5 x rpm vibration in the pump vertical. This is likely vane pass vibration.

Recommendation:

Pump has a high vibration at what appears to be 5 x rpm. This is very likely vane pass frequency if impeller has 5 vanes. If so, then impeller may be damaged or some other internal issue in pump is causing a vane pass vibration. Inspect pump flow

Abbreviated Last Measurement Summary

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Database: Arkema.rbm
Station: PEROXIDE

MEASUREMENT POINT	OVERALL LEVEL	HFD / VHFD
XSTORPMP - X STORAGE PUMP	(15-May-23)	
	OVERALL LEVEL	1-20 KHz
11	.033 In/Sec	.728 G-s
21	.034 In/Sec	.740 G-s
23	.054 In/Sec	.870 G-s
71	.103 In/Sec	.158 G-s
72	.038 In/Sec	.313 G-s
2130-1old - C Concentrator Vacuum Pump	(15-May-23)	
	OVERALL LEVEL	1-20 KHz
11	.081 In/Sec	.379 G-s
21	.088 In/Sec	.618 G-s
23	.132 In/Sec	.398 G-s
71	.135 In/Sec	1.185 G-s
81	.194 In/Sec	.466 G-s
83	.187 In/Sec	1.063 G-s
7000-01 - AGITATOR,HYDROGENATOR C	(15-May-23)	
	OVERALL LEVEL	1-20 KHZ
02	.034 In/Sec	.053 G-s
03	.045 In/Sec	.020 G-s
11	.070 In/Sec	1.383 G-s
12	.110 In/Sec	.491 G-s
13	.120 In/Sec	.860 G-s
21	.098 In/Sec	1.037 G-s
22	.172 In/Sec	.652 G-s
23	.121 In/Sec	.472 G-s
31	.067 In/Sec	.508 G-s
32	.096 In/Sec	.332 G-s
33	.047 In/Sec	.439 G-s
41	.065 In/Sec	.522 G-s
42	.084 In/Sec	.413 G-s
51	.058 In/Sec	.253 G-s
53	.048 In/Sec	.244 G-s
61	.031 In/Sec	.257 G-s
71	.046 In/Sec	.261 G-s
81	.019 In/Sec	.347 G-s
83	.039 In/Sec	.415 G-s
57 - A/B Concentr Vac Pmp-var RPM	(15-May-23)	
	OVERALL LEVEL	1-20 KHz
11	.033 In/Sec	.651 G-s
12	.043 In/Sec	.676 G-s
21	.043 In/Sec	1.358 G-s
23	.063 In/Sec	.486 G-s
71	.062 In/Sec	.895 G-s
81	.083 In/Sec	.829 G-s
83	.068 In/Sec	.622 G-s
2130-1 - FLASH VAP VAC PUMP-var speed	(15-May-23)	
	OVERALL LEVEL	1-20 KHz
11	.047 In/Sec	.209 G-s
12	.047 In/Sec	.450 G-s
21	.041 In/Sec	.783 G-s
22	.098 In/Sec	.294 G-s
23	.060 In/Sec	.179 G-s
71	.178 In/Sec	.663 G-s
72	.206 In/Sec	.371 G-s
81	.191 In/Sec	.917 G-s
82	.147 In/Sec	1.095 G-s

	83	.145 In/Sec	1.160 G-s
C-203	- C-203 Comp		(15-May-23)
		OVERALL LEVEL	1-20 KHz
	11	.075 In/Sec	2.813 G-s
	12	.031 In/Sec	.847 G-s
	21	.067 In/Sec	2.815 G-s
	22	.024 In/Sec	.409 G-s
	23	.017 In/Sec	.342 G-s
		OVERALL LEVEL	1-20 KHZ
	71M	.069 In/Sec	5.327 G-s
	72M	.061 In/Sec	1.392 G-s
	73M	.077 In/Sec	1.240 G-s
	81M	.049 In/Sec	6.882 G-s
	82M	.040 In/Sec	1.392 G-s
	71F	.043 In/Sec	3.651 G-s
	72F	.049 In/Sec	1.256 G-s
	73F	.040 In/Sec	1.045 G-s
	81F	.058 In/Sec	2.708 G-s
	82F	.050 In/Sec	1.051 G-s
C-202	- C-202 Comp		(15-May-23)
		OVERALL LEVEL	1-20 KHz
	11	.063 In/Sec	.427 G-s
	12	.067 In/Sec	.294 G-s
	21	.064 In/Sec	.733 G-s
	22	.074 In/Sec	.211 G-s
	23	.040 In/Sec	.153 G-s
		OVERALL LEVEL	1-20 KHZ
	71M	.060 In/Sec	3.081 G-s
	72M	.048 In/Sec	1.121 G-s
	73M	.081 In/Sec	1.016 G-s
	81M	.057 In/Sec	12.93 G-s
	82M	.055 In/Sec	1.883 G-s
	71F	.047 In/Sec	3.086 G-s
	72F	.076 In/Sec	.989 G-s
	73F	.066 In/Sec	.866 G-s
	81F	.055 In/Sec	3.500 G-s
	82F	.054 In/Sec	.943 G-s
201-08A	- COMPRESSOR,NASH A 201-08A		(15-May-23)
		OVERALL LEVEL	1-20 KHz
	11	.048 In/Sec	.102 G-s
	12	.055 In/Sec	.145 G-s
	13	.112 In/Sec	.066 G-s
	21	.048 In/Sec	.128 G-s
	22	.064 In/Sec	.115 G-s
	23	.159 In/Sec	.110 G-s
	71	.188 In/Sec	.645 G-s
	72	.176 In/Sec	.151 G-s
	73	.136 In/Sec	.193 G-s
	81	.141 In/Sec	.222 G-s
	82	.186 In/Sec	.095 G-s
	83	.118 In/Sec	.176 G-s
202-05	- NASH SEAL LIQUID PUMP-A		(15-May-23)
		OVERALL LEVEL	1-20 KHz
	11	.018 In/Sec	.098 G-s
	21	.019 In/Sec	.211 G-s
	23	.024 In/Sec	.079 G-s
	71	.036 In/Sec	.076 G-s
	72	.018 In/Sec	.070 G-s
9002-10	- D-HYDROGENATOR AGITATOR		(15-May-23)
		OVERALL LEVEL	1-20 KHz
	11	.031 In/Sec	.198 G-s
	21	.052 In/Sec	.503 G-s
	23	.051 In/Sec	.242 G-s
		OVERALL LEVEL	1-20 KHZ
	31	.174 In/Sec	.870 G-s

31L	.125 In/Sec	.823 G-s
	OVERALL LEVEL	1-20 KHz
51	.076 In/Sec	.330 G-s
51L	.176 In/Sec	.330 G-s
52	.194 In/Sec	.657 G-s
52L	.175 In/Sec	.249 G-s
53	.180 In/Sec	.236 G-s
53L	.114 In/Sec	.266 G-s
61	.115 In/Sec	.117 G-s
61L	.192 In/Sec	.117 G-s
81	.034 In/Sec	.040 G-s
82	.053 In/Sec	.037 G-s
83	.043 In/Sec	.034 G-s

9003-01 - D-HYDRO PRIMARY FILT FD PUMP (15-May-23)

	OVERALL LEVEL	1-20 KHz
11	.038 In/Sec	.486 G-s
21	.058 In/Sec	2.052 G-s
23	.060 In/Sec	.774 G-s
71	.070 In/Sec	.268 G-s
72	.106 In/Sec	.319 G-s

9001-01 - D-HYDRO SECOND. FILT FD PUMP (15-May-23)

	OVERALL LEVEL	1-20 KHz
11	.043 In/Sec	.384 G-s
21	.057 In/Sec	1.617 G-s
23	.028 In/Sec	.529 G-s
71	.059 In/Sec	.511 G-s
72	.058 In/Sec	.411 G-s

192-03 - Two Stage Water Pump A-WEST (15-May-23)

	OVERALL LEVEL	1-20 KHz
11	.044 In/Sec	.512 G-s
21	.059 In/Sec	.620 G-s
23	.048 In/Sec	.433 G-s
71	.118 In/Sec	1.014 G-s
72	.059 In/Sec	.523 G-s

191-07 - M MIX BED WATER PUMP 191-07 (15-May-23)

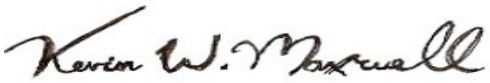
	OVERALL LEVEL	1-20 KHz
11	.080 In/Sec	.730 G-s
21	.057 In/Sec	1.881 G-s
23	.089 In/Sec	.226 G-s
71	.303 In/Sec	.422 G-s
72	.372 In/Sec	.313 G-s

Clarification Of Vibration Units:

Acc	-->	G-s	PK
Vel	-->	In/Sec	PK

As always, it has been a pleasure to serve Arkema. If there are any comments or questions, do not hesitate to contact us.

Sincerely,



ISO Certified Vibration Analyst, Category III

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