HI-SPEED INDUSTRIAL SERVICE

QualiTest® Diagnostics

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May 10, 2023

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Arkema
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The following is a summary of findings from the May 2023 WEEK 1 vibration survey at the H2O2 Plant that was performed on May 4th, 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.

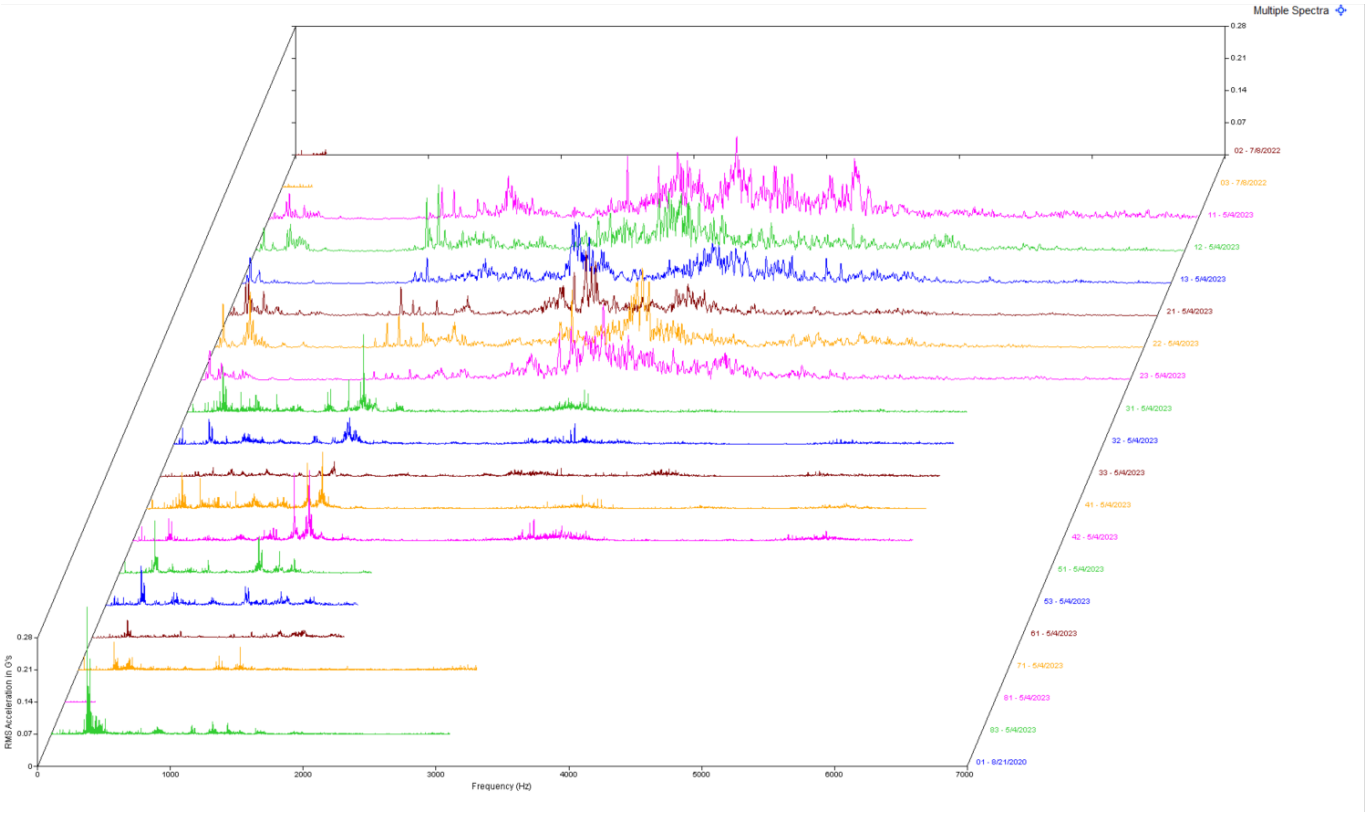
CLASS III; Defect (s) present that may cause failure in short term (less than 2 months). This should be addressed as soon as practical, with a high maintenance priority. Increase monitoring frequency.

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

Hi-Speed **Industrial Service** tests and inspects industrial machinery and equipment and makes recommendations concerning maintenance and repairs based on its experience in the field of industrial repair and maintenance. The information contained herein is provided as an opinion only, not as a guaranty or warranty of the matters discussed herein.

Defect Summary

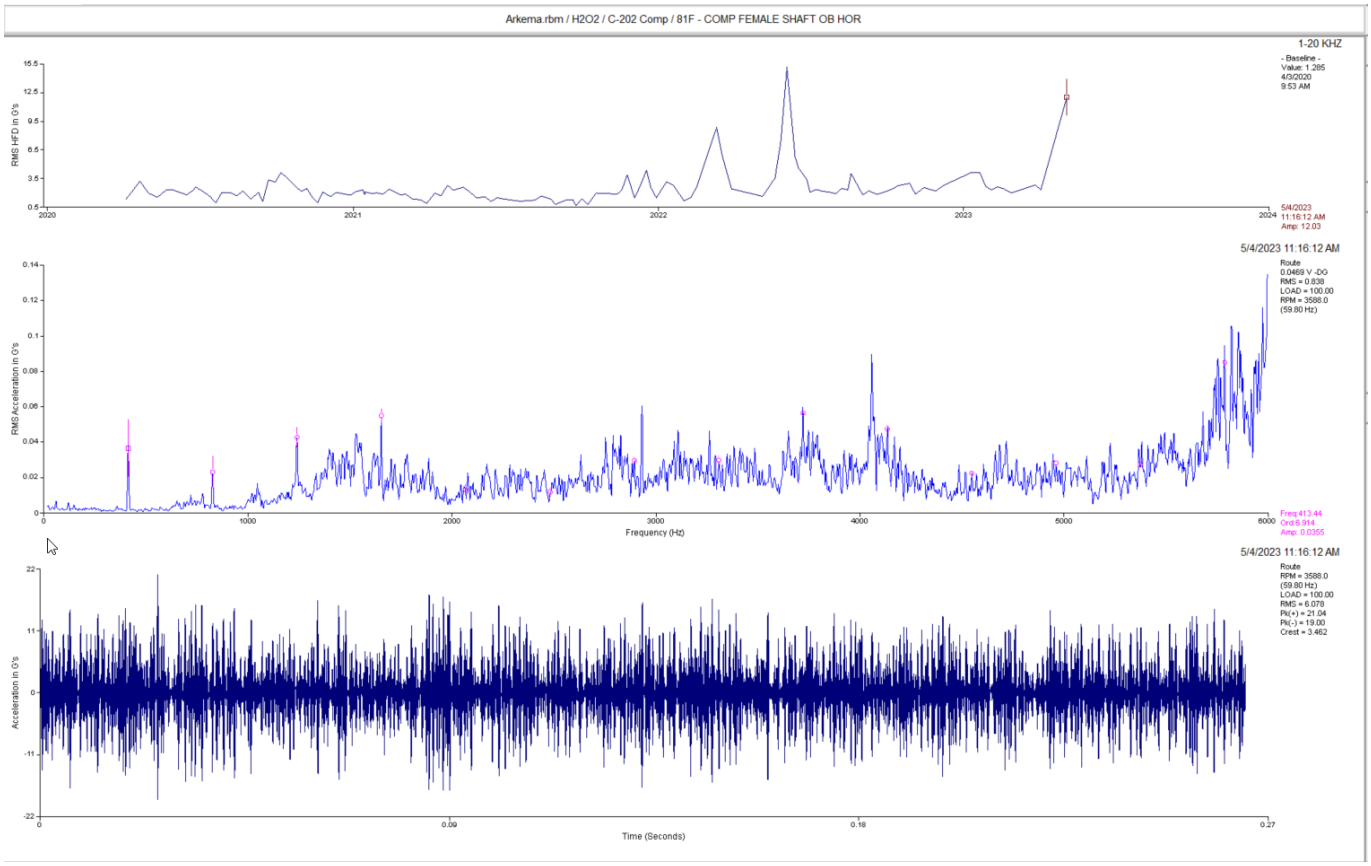
Agitator, Hydrogenator C CLASS II



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 female section. 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.

Abbreviated Last Measurement Summary

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Database: Arkema.rbm
Station: PEROXIDE
Route No. 3: ARK WK 1

MEASUREMENT POINT		OVERALL LEVEL	HFD / VHFD
XSTORPMP	- X STORAGE PUMP	(04-May-23)	
		OVERALL LEVEL	1-20 KHz
11		.049 In/Sec	.467 G-s
21		.052 In/Sec	1.108 G-s
23		.022 In/Sec	.450 G-s
71		.390 In/Sec	.296 G-s
72		.086 In/Sec	.228 G-s
RSTORPMP	- R STORAGE PUMP	(04-May-23)	
		OVERALL LEVEL	1-20 KHz
11		.041 In/Sec	.897 G-s
21		.033 In/Sec	1.148 G-s
23		.084 In/Sec	.546 G-s
71		.102 In/Sec	.504 G-s
72		.053 In/Sec	.385 G-s
2130-1old	- C Concentrator Vacuum Pump	(04-May-23)	
		OVERALL LEVEL	1-20 KHz
11		.066 In/Sec	.554 G-s
21		.078 In/Sec	.645 G-s
23		.144 In/Sec	.424 G-s
71		.136 In/Sec	2.166 G-s
81		.201 In/Sec	.825 G-s
83		.097 In/Sec	.581 G-s
7000-01	- AGITATOR,HYDROGENATOR C	(04-May-23)	
		OVERALL LEVEL	1-20 KHZ
11		.072 In/Sec	1.619 G-s
12		.104 In/Sec	1.155 G-s
13		.103 In/Sec	1.030 G-s
21		.094 In/Sec	.783 G-s
22		.172 In/Sec	1.001 G-s
23		.117 In/Sec	1.186 G-s
31		.077 In/Sec	.534 G-s
32		.089 In/Sec	.501 G-s
33		.036 In/Sec	.317 G-s
41		.070 In/Sec	.476 G-s
42		.082 In/Sec	.582 G-s
51		.077 In/Sec	.264 G-s
53		.067 In/Sec	.275 G-s
61		.032 In/Sec	.243 G-s
71		.060 In/Sec	.240 G-s
81		.022 In/Sec	.305 G-s
83		.062 In/Sec	.295 G-s
57	- A/B Concentr Vac Pmp-var RPM	(04-May-23)	
		OVERALL LEVEL	1-20 KHz
11		.042 In/Sec	.300 G-s
12		.034 In/Sec	.209 G-s
21		.037 In/Sec	.241 G-s
23		.043 In/Sec	.240 G-s
71		.056 In/Sec	.523 G-s
81		.053 In/Sec	.618 G-s
83		.028 In/Sec	.387 G-s

2130-1 - FLASH VAP VAC PUMP-var speed (04-May-23)

	OVERALL LEVEL	1-20 KHz
11	.057 In/Sec	.235 G-s
12	.043 In/Sec	.342 G-s
21	.046 In/Sec	.329 G-s
22	.043 In/Sec	.250 G-s
23	.072 In/Sec	.333 G-s
71	.067 In/Sec	.543 G-s
72	.073 In/Sec	.611 G-s
81	.077 In/Sec	1.020 G-s
82	.084 In/Sec	1.549 G-s
83	.042 In/Sec	.876 G-s

236-06 - HYDRO FD PUMP N 236-06 -2FLR (04-May-23)

	OVERALL LEVEL	1-20 KHz
11	.077 In/Sec	.553 G-s
21	.062 In/Sec	.463 G-s

2130-6 - ABC SEC FILT FEED PUMP-NORTH (04-May-23)

	OVERALL LEVEL	1-20 KHz
11	.036 In/Sec	.508 G-s
21	.029 In/Sec	.536 G-s
23	.034 In/Sec	.212 G-s
71	.201 In/Sec	.803 G-s
72	.128 In/Sec	1.089 G-s

9001-1 - EAST OXIDIZER FEED PUMP (04-May-23)

	OVERALL LEVEL	1-20 KHz
11	.051 In/Sec	.634 G-s
21	.041 In/Sec	.976 G-s
23	.045 In/Sec	.249 G-s
71	.104 In/Sec	.754 G-s
72	.129 In/Sec	.472 G-s

9001-2 - MIDDLE OXIDIZER FEED PUMP (04-May-23)

	OVERALL LEVEL	1-20 KHz
11	.048 In/Sec	1.178 G-s
21	.044 In/Sec	1.321 G-s
23	.036 In/Sec	1.092 G-s
71	.084 In/Sec	.383 G-s
72	.112 In/Sec	.342 G-s

7016-11 - WEST OXIDIZER FEED PUMP (04-May-23)

	OVERALL LEVEL	1-20 KHz
11	.025 In/Sec	1.162 G-s
21	.023 In/Sec	1.127 G-s
23	.016 In/Sec	1.420 G-s
71	.109 In/Sec	.541 G-s
72	.101 In/Sec	.422 G-s

234-01 - CHILL WATER PUMP 234-01 (04-May-23)

	OVERALL LEVEL	1-20 KHz
11	.030 In/Sec	1.475 G-s
21	.030 In/Sec	1.429 G-s
23	.034 In/Sec	
71	.063 In/Sec	.356 G-s
72	.047 In/Sec	.364 G-s

C-203 - C-203 Comp (04-May-23)

	OVERALL LEVEL	1-20 KHz
11	.070 In/Sec	3.029 G-s
12	.068 In/Sec	2.202 G-s
21	.097 In/Sec	4.001 G-s
22	.068 In/Sec	2.572 G-s
23	.033 In/Sec	1.566 G-s
	OVERALL LEVEL	1-20 KHZ
71M	.060 In/Sec	4.231 G-s
72M	.054 In/Sec	3.879 G-s
73M	.054 In/Sec	2.713 G-s

	81M	.069 In/Sec	9.445 G-s
	82M	.054 In/Sec	5.269 G-s
	71F	.039 In/Sec	3.632 G-s
	72F	.056 In/Sec	3.924 G-s
	81F	.036 In/Sec	3.340 G-s
	82F	.035 In/Sec	2.689 G-s

9000-02 - D HYDROGENATOR FD PUMP- EAST (04-May-23)

	OVERALL LEVEL	1-20 KHz
11	.031 In/Sec	.921 G-s
21	.046 In/Sec	.553 G-s
23	.032 In/Sec	.891 G-s
71	.096 In/Sec	.861 G-s
72	.080 In/Sec	.739 G-s

236-04A - HYDROGNTOR PRECOOLER FD PUMP (04-May-23)

	OVERALL LEVEL	1-20 KHz
11	.038 In/Sec	3.209 G-s
21	.060 In/Sec	2.419 G-s
23	.044 In/Sec	2.976 G-s
71	.129 In/Sec	.416 G-s
72	.052 In/Sec	.350 G-s

C-202 - C-202 Comp (04-May-23)

	OVERALL LEVEL	1-20 KHz
11	.130 In/Sec	5.210 G-s
12	.126 In/Sec	1.807 G-s
21	.062 In/Sec	.717 G-s
22	.110 In/Sec	2.679 G-s
23	.033 In/Sec	.450 G-s
	OVERALL LEVEL	1-20 KHZ
71M	.053 In/Sec	6.106 G-s
72M	.057 In/Sec	3.421 G-s
73M	.072 In/Sec	2.255 G-s
81M	.053 In/Sec	8.026 G-s
82M	.067 In/Sec	2.452 G-s
71F	.034 In/Sec	6.888 G-s
72F	.070 In/Sec	3.615 G-s
81F	.047 In/Sec	17.00 G-s
82F	.052 In/Sec	3.075 G-s

201-08A - COMPRESSOR,NASH A 201-08A (04-May-23)

	OVERALL LEVEL	1-20 KHz
11	.052 In/Sec	.181 G-s
12	.071 In/Sec	.213 G-s
13	.091 In/Sec	.169 G-s
21	.044 In/Sec	.083 G-s
22	.056 In/Sec	.174 G-s
23	.118 In/Sec	.101 G-s
71	.149 In/Sec	.683 G-s
72	.181 In/Sec	.523 G-s
73	.117 In/Sec	.479 G-s
81	.137 In/Sec	.199 G-s
82	.186 In/Sec	.264 G-s
83	.096 In/Sec	.201 G-s

9002-10 - D-HYDROGENATOR AGITATOR (04-May-23)

	OVERALL LEVEL	1-20 KHz
11	.067 In/Sec	.241 G-s
21	.057 In/Sec	.565 G-s
23	.092 In/Sec	.299 G-s
	OVERALL LEVEL	1-20 KHZ
31	.158 In/Sec	.970 G-s
31L	.276 In/Sec	1.110 G-s
	OVERALL LEVEL	1-20 KHz
51	.181 In/Sec	.368 G-s
51L	.231 In/Sec	.368 G-s
52	.245 In/Sec	.187 G-s
52L	.214 In/Sec	.213 G-s
53	.039 In/Sec	.363 G-s

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              53L                      .023 In/Sec       .350 G-s
              61                       .184 In/Sec       .447 G-s
              61L                      .159 In/Sec       .378 G-s
              81                       .033 In/Sec       .037 G-s
              82                       .032 In/Sec       .024 G-s
              83                       .018 In/Sec       .042 G-s

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   Clarification Of Vibration Units:
      Acc       -->  G-s       PK
      Vel       -->  In/Sec    PK
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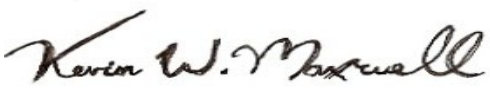
As always, it has been a pleasure to serve Arkema. If there are any comments or questions, do not hesitate to contact us.

Sincerely,



ISO Certified Vibration Analyst, Category III

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