HI-SPEED INDUSTRIAL SERVICE QualiTest® Diagnostics

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June 9th, 2023

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Arkema
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The following is a summary of findings from the June 2023 WEEK 1 vibration survey at the H2O2 Plant that was performed on June 5th, 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.

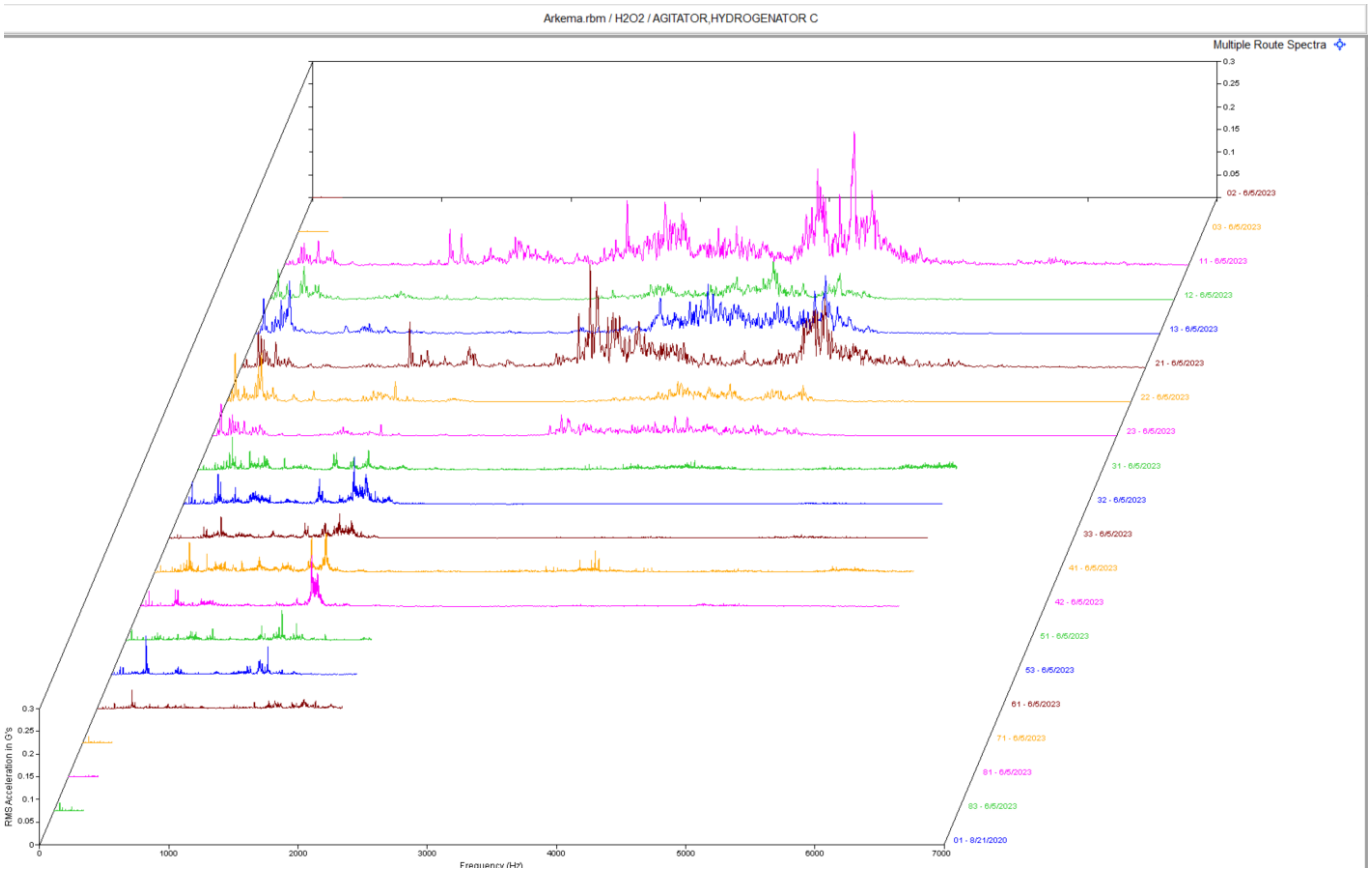
CLASS II: Defect (s) present that may cause problem in long term (2-6 months). Repair during normal maintenance scheduling. Continue to monitor.

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

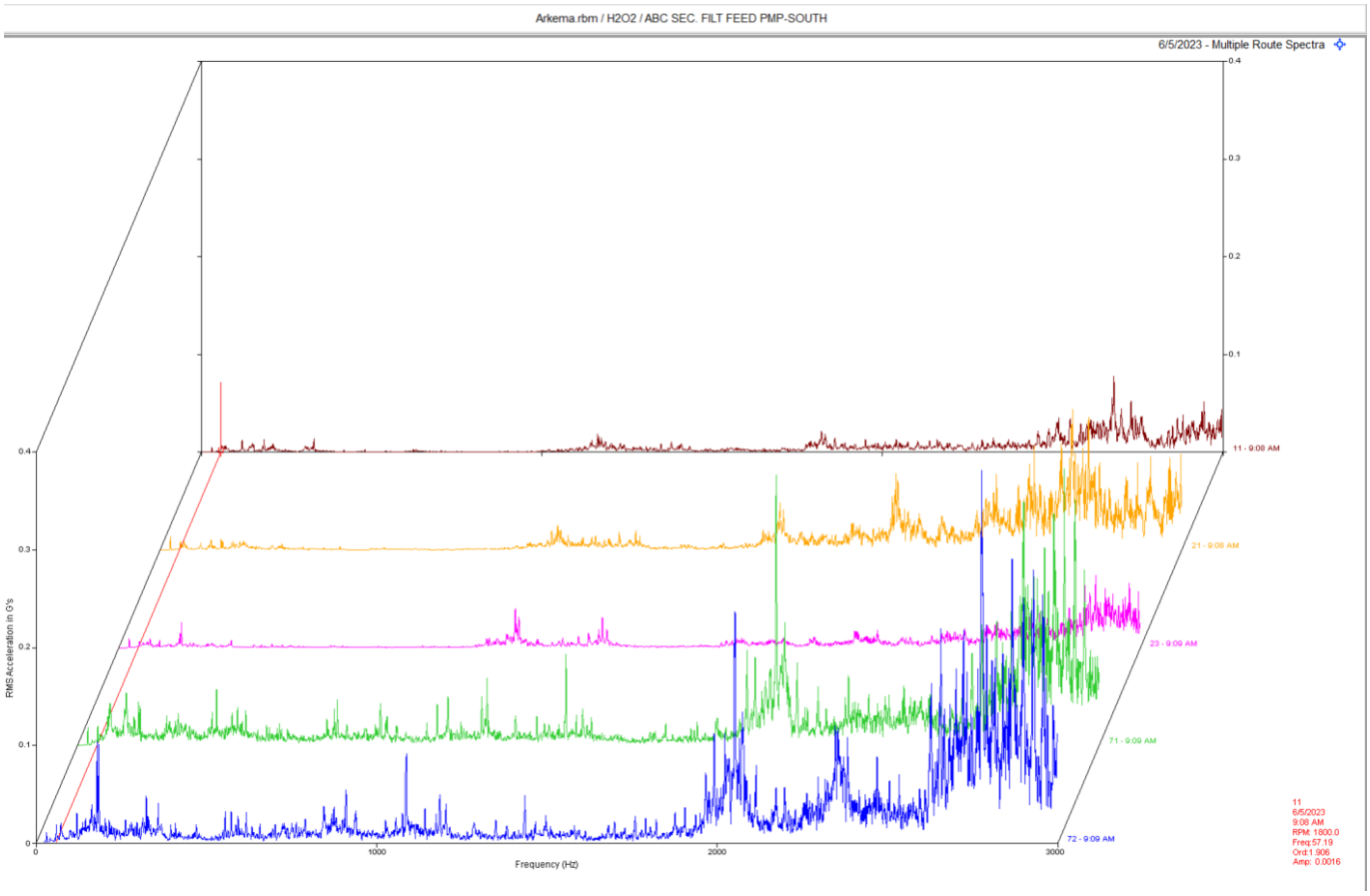
Agitator, Hydrogenator C CLASS II



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. May also be rolling element defects in bearings. For now, it is recommended that the motor is receiving an adequate amount of grease.

ABC SEC Filtered Feed Pump SOUTH CLASS II



Observation:

Data above is multi-point spectra of motor and pump. Motor and pump both have increased noise floor in spectra. This may be combination of bearing wear and cavitation in pump.

Recommendation:

Inspect pump for defects and ensure pump flow is near BEP of pump.

Abbreviated Last Measurement Summary

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

MEASUREMENT POINT		OVERALL LEVEL	HFD / VHFD
2130-1old	- C Concentrator Vacuum Pump	(05-Jun-23)	
		OVERALL LEVEL	1-20 KHz
11		.077 In/Sec	.378 G-s
21		.090 In/Sec	.545 G-s
23		.126 In/Sec	.310 G-s
71		.144 In/Sec	1.301 G-s
81		.189 In/Sec	.545 G-s
83		.159 In/Sec	1.279 G-s
7000-01	- AGITATOR,HYDROGENATOR C	(05-Jun-23)	
		OVERALL LEVEL	1-20 KHZ
02		.038 In/Sec	.061 G-s
03		.045 In/Sec	.037 G-s
11		.079 In/Sec	1.625 G-s
12		.127 In/Sec	.569 G-s
13		.146 In/Sec	.721 G-s
21		.102 In/Sec	1.582 G-s
22		.194 In/Sec	.325 G-s
23		.122 In/Sec	.342 G-s
31		.070 In/Sec	.501 G-s
32		.107 In/Sec	.521 G-s
33		.046 In/Sec	.344 G-s
41		.066 In/Sec	.493 G-s
42		.090 In/Sec	.501 G-s
51		.060 In/Sec	.243 G-s
53		.056 In/Sec	.200 G-s
61		.030 In/Sec	.286 G-s
71		.047 In/Sec	.256 G-s
81		.019 In/Sec	.334 G-s
83		.052 In/Sec	.242 G-s
57	- A/B Concentr Vac Pmp-var RPM	(05-Jun-23)	
		OVERALL LEVEL	1-20 KHz
11		.052 In/Sec	.648 G-s
12		.097 In/Sec	.761 G-s
21		.055 In/Sec	1.044 G-s
23		.071 In/Sec	.966 G-s
71		.072 In/Sec	.871 G-s
81		.115 In/Sec	.986 G-s
83		.067 In/Sec	.523 G-s
2130-1	- FLASH VAP VAC PUMP-var speed	(05-Jun-23)	
		OVERALL LEVEL	1-20 KHz
11		.051 In/Sec	.187 G-s
12		.057 In/Sec	.154 G-s
21		.041 In/Sec	.682 G-s
22		.184 In/Sec	.187 G-s
23		.098 In/Sec	.127 G-s
71		.078 In/Sec	1.082 G-s
72		.132 In/Sec	.686 G-s
81		.068 In/Sec	.720 G-s
82		.089 In/Sec	.750 G-s
83		.055 In/Sec	.500 G-s
236-06	- HYDRO FD PUMP N 236-06 -2FLR	(05-Jun-23)	
		OVERALL LEVEL	1-20 KHz
11		.091 In/Sec	.185 G-s
21		.062 In/Sec	1.190 G-s

7007-24 - ABC SEC. FILT FEED PMP-SOUTH (05-Jun-23)

	OVERALL LEVEL	1-20 KHz
11	.042 In/Sec	1.376 G-s
21	.065 In/Sec	2.043 G-s
23	.048 In/Sec	2.439 G-s
71	.180 In/Sec	3.999 G-s
72	.165 In/Sec	4.183 G-s

2130-6 - ABC SEC FILT FEED PUMP-NORTH (05-Jun-23)

	OVERALL LEVEL	1-20 KHz
11	.030 In/Sec	.551 G-s
21	.033 In/Sec	.762 G-s
23	.031 In/Sec	.839 G-s
71	.104 In/Sec	1.335 G-s
72	.100 In/Sec	1.114 G-s

9001-1 - EAST OXIDIZER FEED PUMP (05-Jun-23)

	OVERALL LEVEL	1-20 KHz
11	.043 In/Sec	.469 G-s
21	.047 In/Sec	.493 G-s
23	.040 In/Sec	.266 G-s
71	.106 In/Sec	.964 G-s
72	.143 In/Sec	.598 G-s

9001-2 - MIDDLE OXIDIZER FEED PUMP (05-Jun-23)

	OVERALL LEVEL	1-20 KHz
11	.050 In/Sec	.873 G-s
21	.056 In/Sec	.878 G-s
23	.042 In/Sec	.523 G-s
71	.066 In/Sec	.354 G-s
72	.074 In/Sec	.418 G-s

7016-11 - WEST OXIDIZER FEED PUMP (05-Jun-23)

	OVERALL LEVEL	1-20 KHz
11	.035 In/Sec	.756 G-s
21	.191 In/Sec	1.104 G-s
23	.023 In/Sec	.685 G-s
71	.092 In/Sec	.955 G-s
72	.084 In/Sec	.940 G-s

C-203 - C-203 Comp (05-Jun-23)

	OVERALL LEVEL	1-20 KHz
11	.079 In/Sec	2.891 G-s
12	.047 In/Sec	1.552 G-s
21	.063 In/Sec	2.699 G-s
22	.029 In/Sec	.461 G-s
23	.018 In/Sec	.330 G-s
	OVERALL LEVEL	1-20 KHZ
71M	.055 In/Sec	3.310 G-s
72M	.043 In/Sec	.994 G-s
73M	.070 In/Sec	1.132 G-s
81M	.041 In/Sec	4.688 G-s
82M	.037 In/Sec	.924 G-s
71F	.065 In/Sec	2.091 G-s
72F	.058 In/Sec	.751 G-s
73F	.065 In/Sec	.677 G-s
81F	.042 In/Sec	2.591 G-s
82F	.082 In/Sec	2.292 G-s

9000-02 - D HYDROGENATOR FD PUMP- EAST (05-Jun-23)

	OVERALL LEVEL	1-20 KHz
11	.057 In/Sec	.859 G-s
21	.050 In/Sec	.662 G-s
23	.034 In/Sec	.885 G-s
71	.100 In/Sec	.860 G-s
72	.075 In/Sec	.839 G-s

236-04A - HYDROGNTOR PRECOOLER FD PUMP (05-Jun-23)

	OVERALL LEVEL	1-20 KHz
11	.050 In/Sec	2.465 G-s

	21	.079 In/Sec	1.819 G-s
	23	.045 In/Sec	2.016 G-s
	71	.135 In/Sec	.417 G-s
	72	.055 In/Sec	.348 G-s

C-202 - C-202 Comp (05-Jun-23)

	OVERALL LEVEL	1-20 KHz
11	.053 In/Sec	1.603 G-s
12	.142 In/Sec	.775 G-s
21	.063 In/Sec	.484 G-s
22	.065 In/Sec	.102 G-s
23	.038 In/Sec	.071 G-s
	OVERALL LEVEL	1-20 KHZ
71M	.051 In/Sec	4.014 G-s
72M	.046 In/Sec	.721 G-s
73M	.074 In/Sec	1.129 G-s
81M	.057 In/Sec	18.52 G-s
82M	.061 In/Sec	1.720 G-s
71F	.032 In/Sec	6.231 G-s
72F	.072 In/Sec	.497 G-s
73F	.041 In/Sec	.884 G-s
81F	.042 In/Sec	14.05 G-s
82F	.062 In/Sec	1.860 G-s

new AC - INSTRUMENT AIR COMPRESSOR (05-Jun-23)

	OVERALL LEVEL	1-20 KHz
11	.088 In/Sec	1.171 G-s
12	.094 In/Sec	1.074 G-s
13	.053 In/Sec	.806 G-s
21	.073 In/Sec	1.843 G-s
22	.071 In/Sec	1.104 G-s
23	.049 In/Sec	1.228 G-s
	OVERALL LEVEL	1-20 KHZ
71F	.097 In/Sec	10.46 G-s
72F	.107 In/Sec	6.120 G-s
73F	.139 In/Sec	11.11 G-s
81F	.121 In/Sec	8.087 G-s
82F	.318 In/Sec	7.097 G-s
83F	.220 In/Sec	7.365 G-s
71M	.140 In/Sec	13.41 G-s
72M	.192 In/Sec	18.57 G-s
73M	.138 In/Sec	8.103 G-s
81M	.122 In/Sec	8.760 G-s
82M	.137 In/Sec	4.494 G-s
83M	.242 In/Sec	12.57 G-s

201-08A - COMPRESSOR,NASH A 201-08A (05-Jun-23)

	OVERALL LEVEL	1-20 KHz
11	.052 In/Sec	.137 G-s
12	.063 In/Sec	.186 G-s
13	.101 In/Sec	.085 G-s
21	.054 In/Sec	.111 G-s
22	.074 In/Sec	.131 G-s
23	.117 In/Sec	.117 G-s
71	.151 In/Sec	.660 G-s
72	.157 In/Sec	.198 G-s
73	.128 In/Sec	.252 G-s
81	.144 In/Sec	.171 G-s
82	.184 In/Sec	.174 G-s
83	.105 In/Sec	.131 G-s

9002-10 - D-HYDROGENATOR AGITATOR (05-Jun-23)

	OVERALL LEVEL	1-20 KHz
11	.068 In/Sec	.328 G-s
21	.064 In/Sec	.454 G-s
23	.073 In/Sec	.098 G-s
	OVERALL LEVEL	1-20 KHZ
31	.216 In/Sec	1.047 G-s
31L	.102 In/Sec	.921 G-s
	OVERALL LEVEL	1-20 KHz

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            51                        .258 In/Sec        .554 G-s
            51L                       .258 In/Sec        .554 G-s
            52                        .084 In/Sec        .610 G-s
            52L                       .257 In/Sec        .328 G-s
            53                        .218 In/Sec        .902 G-s
            53L                       .159 In/Sec        .701 G-s
            61                        .157 In/Sec        .329 G-s
            61L                       .134 In/Sec        .329 G-s
            81                        .032 In/Sec        .037 G-s
            82                        .030 In/Sec        .067 G-s
            83                        .035 In/Sec        .019 G-s

      EP15       - CENTAC Compressor              (05-Jun-23)
                                  OVERALL LEVEL      1-20 KHz
            11                        .075 In/Sec       1.160 G-s
            12                        .130 In/Sec        .634 G-s
            13                        .114 In/Sec       1.420 G-s
            21                        .100 In/Sec       1.106 G-s
            22                        .099 In/Sec       1.050 G-s
            23                        .059 In/Sec       2.177 G-s

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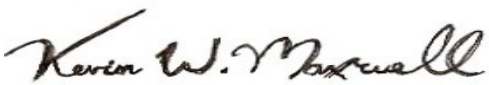
As always, it has been a pleasure to serve Arkema. If there are any comments or questions, do not hesitate to contact us.

Sincerely,



ISO Certified Vibration Analyst, Category III

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