February 21, 2020

ARKEMA

Subject: February week 2 vibration service report

Weekly Equipment

C Concentrator Vacuum Pump 2130-1 old
The motor axial vibration has dropped. No action is required.

Agitator, Hydrogenator C 7001-01
No legitimate vibrations were found to be above 0.155"/sec velocity peak overall for the gearbox output axial. Spectrum appears normal for unit. No action required.

A/B Concentrator Vacuum Pump 57
Overall vibrations have jumped up for the outboard pump bearing and is at 0.361"/sec velocity peak, at what looks to be mostly vane pass. We must note; however, that the vibration changes constantly as the vacuum breaks, so the overall reading and the data could change significantly during a short period of time. No immediate action is required at this time. **Rated a Class II Defect**.

Flash Vacuum Pump 2130-1
Vibrations appear to be normal this survey. No actions required.

Air Compressor C-201
Rotor bar vibrations are at 1 g RMS. The trend clearly shows that the vibrations vary considerably over time. We still believe these motors have possible weak rotor bar end connections that cause the vibrations to fluctuate higher due to loading. We will continue to monitor this unit for changes No actions required.

Air Compressor C-202
Rotor bar vibrations are at 1 g RMS. The trend clearly shows that the vibrations vary considerably over time. No actions required.

Air Compressor C-203
Rotor bar vibrations are at 2.6 g's RMS. The trend clearly shows that the vibrations vary considerably over time. We still believe these motors have possible weak rotor bar end connections that cause the vibrations to fluctuate higher due to loading. We will continue to monitor this unit for changes. No actions required.

7030 Ryburn Drive
Millington, TN 38053
P. 901-873-5300
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Instrument Air Compressor new

Oil was found on and under the compressor. It appeared to be sprayed on the unit and puddled on the floor. A device mounted to the west side if the unit was emitting vapors. Inspect as soon as possible. Vibration appeared to be about normal. **Rated a Class IV Defect.**

Air Compressor NASH A 201-08A
Vibrations are still down in the motor after the foot bolts were tightened. We recommend a complete cleaning and republication of all the foot bolts for the motor and vacuum pump. Pump vibrations are mixed. Check the pump bearing large flange bolts also. Check both shafts for excessive clearance with a lift check and finish with a shaft alignment. The pump is at 0.3"/sec velocity so the unit is still **rated a Class II Defect.**

D Hydrogenator Agitator 9002-10
Vibration data shows a slight change in vibrations this survey. Highest amplitude is still at 0.27"/sec velocity peak for the gearbox top E/W measurement. **Still rated a Class I Defect.**

Monthly Equipment

None rated this survey.

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.

This completes our assessment of your equipment for this survey. Thank you for your business and don't hesitate to call if you have any comments or questions.

Sincerely,

David W. Shook
Senior Reliability Specialist
dshook@gohispeed.com
Hi-Speed **Industrial Service**

Abbreviated Last Measurement Summary

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Database: Arkema.rbm
Station: PEROXIDE
Route No. 3: ARK WK 2
Report Date: 21-Feb-20 11:46

MEASUREMENT POINT	OVERALL LEVEL	HFD / VHFD
2130-1old - C Concentrator Vacuum Pump (19-Feb-20)		
	OVERALL LEVEL	
11	.061 In/Sec	
21	.076 In/Sec	
23	.116 In/Sec	
71	.117 In/Sec	
81	.181 In/Sec	
83	.094 In/Sec	
7000-01 - AGITATOR,HYDROGENATOR C (19-Feb-20)		
	OVERALL LEVEL	
01	.046 In/Sec	
02	.047 In/Sec	
03	.048 In/Sec	
11	.138 In/Sec	
12	.054 In/Sec	
13	.052 In/Sec	
21	.054 In/Sec	
22	.063 In/Sec	
23	.057 In/Sec	
31	.078 In/Sec	
32	.076 In/Sec	
33	.076 In/Sec	
41	.058 In/Sec	
42	.051 In/Sec	
53	.155 In/Sec	
53L	.152 In/Sec	
57 - A/B Concentr Vac Pmp-var RPM (19-Feb-20)		
	OVERALL LEVEL	
11	.047 In/Sec	
12	.069 In/Sec	
21	.088 In/Sec	
23	.061 In/Sec	
71	.119 In/Sec	
81	.361 In/Sec	
83	.066 In/Sec	
2130-1 - FLASH VAP VAC PUMP-var speed (19-Feb-20)		
	OVERALL LEVEL	
11	.041 In/Sec	
12	.039 In/Sec	
21	.046 In/Sec	

	22	.042 In/Sec
	23	.045 In/Sec
	71	.078 In/Sec
	72	.075 In/Sec
	81	.075 In/Sec
	82	.099 In/Sec
	83	.067 In/Sec

236-06 - HYDRO FD PUMP N 236-06 -2FLR (11-Feb-20)

		OVERALL LEVEL
	11	.109 In/Sec
	21	.077 In/Sec

236-26 - HYDRO FD PUMP S 236-26-2FLR (23-Aug-19)

		OVERALL LEVEL
	11	.103 In/Sec
	21	.073 In/Sec
	23	.103 In/Sec
*	71	.031 In/Sec
*	72	.031 In/Sec

7007-24 - ABC SEC. FILT FEED PMP-SOUTH (19-Feb-20)

		OVERALL LEVEL
	11	.036 In/Sec
	21	.045 In/Sec
	23	.035 In/Sec
	71	.174 In/Sec
	72	.142 In/Sec

2130-6 - ABC SEC FILT FEED PUMP-NORTH (19-Feb-20)

		OVERALL LEVEL
	11	.045 In/Sec
	21	.055 In/Sec
	23	.048 In/Sec
	71	.118 In/Sec
	72	.096 In/Sec

9001-1 - EAST OXIDIZER FEED PUMP (19-Feb-20)

		OVERALL LEVEL
	11	.071 In/Sec
	21	.054 In/Sec
	23	.044 In/Sec
	71	.091 In/Sec
	72	.075 In/Sec

9001-2 - MIDDLE OXIDIZER FEED PUMP (19-Feb-20)

		OVERALL LEVEL
	11	.046 In/Sec
	21	.034 In/Sec
	23	.050 In/Sec
	71	.101 In/Sec
	72	.093 In/Sec

7016-11 - WEST OXIDIZER FEED PUMP (19-Feb-20)

		OVERALL LEVEL
	11	.024 In/Sec
	21	.019 In/Sec

	23	.020 In/Sec	
	71	.091 In/Sec	
	72	.068 In/Sec	
234-01	- CHILL WATER PUMP 234-01		(19-Feb-20)
		OVERALL LEVEL	
	11	.035 In/Sec	
	11L	.048 In/Sec	
	21	.039 In/Sec	
	23	.042 In/Sec	
	23L	.040 In/Sec	
	71	.060 In/Sec	
	72	.063 In/Sec	
C-203	- C-203 Comp		(19-Feb-20)
		OVERALL LEVEL	1-20 KHz
	11	.020 In/Sec	.297 G-s
	12	.073 In/Sec	2.601 G-s
	21	.021 In/Sec	.314 G-s
	22	.027 In/Sec	.493 G-s
	23	.055 In/Sec	1.303 G-s
	71M	.033 In/Sec	
	72M	.022 In/Sec	
	73M	.058 In/Sec	
	81M	.062 In/Sec	
	82M	.049 In/Sec	
	71F	.049 In/Sec	
	72F	.054 In/Sec	
	73F	.063 In/Sec	
	81F	.045 In/Sec	
	82F	.042 In/Sec	
9000-02	- D HYDROGENATOR FD PUMP- EAST		(08-Aug-19)
		OVERALL LEVEL	
	11	.172 In/Sec	
	21	.187 In/Sec	
	23	.130 In/Sec	
	71	.115 In/Sec	
	72	.166 In/Sec	
9000-01	- D HYDROGENATOR FD PUMP- WEST		(19-Feb-20)
		OVERALL LEVEL	
	11	.028 In/Sec	
	21	.030 In/Sec	
	23	.022 In/Sec	
	71	.077 In/Sec	
	72	.059 In/Sec	
236-04A	- HYDROGNTOR PRECOOLER FD PUMP		(19-Feb-20)
		OVERALL LEVEL	
	11	.059 In/Sec	
	21	.068 In/Sec	
	23	.082 In/Sec	
	71	.129 In/Sec	
	72	.062 In/Sec	
C-202	- C-202 Comp		(19-Feb-20)

		OVERALL LEVEL	1-20 KHz
	11	.059 In/Sec	.950 G-s
	12	.125 In/Sec	.121 G-s
	21	.068 In/Sec	.435 G-s
	22	.063 In/Sec	.189 G-s
	23	.061 In/Sec	.436 G-s
	71M	.040 In/Sec	
	72M	.049 In/Sec	
	73M	.079 In/Sec	
	81M	.060 In/Sec	
	82M	.067 In/Sec	
	71F	.044 In/Sec	
	72F	.064 In/Sec	
	73F	.067 In/Sec	
	81F	.056 In/Sec	
	82F	.056 In/Sec	

C-201 - C-201 Comp (19-Feb-20)

	OVERALL LEVEL	1-20 KHz
11	.090 In/Sec	1.107 G-s
12	.052 In/Sec	.551 G-s
21	.092 In/Sec	1.012 G-s
22	.059 In/Sec	.333 G-s
23	.073 In/Sec	.940 G-s
71M	.054 In/Sec	
72M	.043 In/Sec	
73M	.076 In/Sec	
81M	.080 In/Sec	
82M	.059 In/Sec	
71F	.046 In/Sec	
72F	.046 In/Sec	
73F	.056 In/Sec	
81F	.094 In/Sec	
82F	.056 In/Sec	

new AC - INSTRUMENT AIR COMPRESSOR (19-Feb-20)

	OVERALL LEVEL	1-20 KHz
11	.155 In/Sec	.273 G-s
12	.108 In/Sec	.980 G-s
13	.058 In/Sec	.492 G-s
21	.172 In/Sec	1.345 G-s
22	.099 In/Sec	.833 G-s
23	.129 In/Sec	.263 G-s
71F	.225 In/Sec	
72F	.166 In/Sec	
73F	.190 In/Sec	
81F	.153 In/Sec	
82F	.264 In/Sec	
83F	.181 In/Sec	
71M	.125 In/Sec	
72M	.246 In/Sec	
73M	.139 In/Sec	
81M	.187 In/Sec	
82M	.301 In/Sec	
83M	.280 In/Sec	

201-08A - COMPRESSOR,NASH A 201-08A (19-Feb-20)

	OVERALL LEVEL
11	.069 In/Sec
12	.085 In/Sec
13	.183 In/Sec
21	.091 In/Sec
22	.134 In/Sec
23	.174 In/Sec
71	.180 In/Sec
72	.264 In/Sec
73	.205 In/Sec
81	.168 In/Sec
82	.293 In/Sec
83	.190 In/Sec

9002-10 - D-HYDROGENATOR AGITATOR (19-Feb-20)

	OVERALL LEVEL
11	.073 In/Sec
21	.066 In/Sec
23	.049 In/Sec
31	.199 In/Sec
31L	.232 In/Sec
51	.219 In/Sec
51L	.270 In/Sec
52	.253 In/Sec
52L	.251 In/Sec
53	.149 In/Sec
61	.131 In/Sec
61L	.173 In/Sec
81	.043 In/Sec
82	.042 In/Sec
83	.042 In/Sec

Clarification Of Vibration Units:

Acc	-->	G-s	PK
Vel	-->	In/Sec	PK
Dsp	-->	Mils	P-P

* - Indicates Data Has Date/Time Different From Machine Date/Time