

November 11, 2019

ARKEMA

Subject: November week 2 vibration service report

Weekly Equipment**Agitator, Hydrogenator C 7001-01**

No legitimate vibrations were found to be above 0.175"/sec velocity peak overall for the gearbox input axial. Spectrum appears normal for unit. No action required.

A/B Concentrator Vacuum Pump 57

Overall vibrations have increased slightly for the outboard pump bearing and is at 0.246"/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 I Defect.**

Flash Vacuum Pump 2130-1

Vibrations in this unit appear normal again. No actions required.

Air Compressor C-201

Rotor bar vibrations jumped a little, to just over 5 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.

Air Compressor C-202

Vibrations in this unit appear normal. No actions required.

Air Compressor C-203

Vibrations appear normal this week. 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 NASH 201-08

Vibrations in this unit appear normal. No actions required.

D Hydrogenator Agitator 9002-10

Vibration data shows a slight increase in vibrations this survey. Highest amplitude is still only 0.253"/sec velocity peak for the gearbox top measurement. Process variables is suspected for the change. **Still rated a Class I Defect Though.**

C Concentrator Vacuum Pump 2130-1 old

The motor axial vibration is still up at 0.237"/sec velocity Peak after replacement; otherwise, vibrations in this unit appear normal. Check the shaft alignment as time allows. **Rated a Class II Defect.**

Monthly Equipment this Survey on report

No Week 2 monthly equipment had reportable issues.

Week 2 equipment list follows as well as measurements.

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
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Hi-Speed Industrial Service

Last Monitored Machine List

Database: Arkema.rbm
 Station: PEROXIDE
 Route No. 4: ARK WK 2
 Report Date: 11-Nov-19 13:26
 Report Interval: 12-Oct-19 To 11-Nov-19

PERIODIC VIBRATION TECHNOLOGY

Collected Machine...

MACHINE ID	DESCRIPTION	NUMBER OF POINTS	LATEST DATE
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7000-01	AGITATOR, HYDROGENATOR C	22 OUT OF 22	11-Nov-19
57	A/B Concentr Vac Pmp-var RPM	10 OUT OF 10	11-Nov-19
2130-1	FLASH VAP VAC PUMP-var speed	10 OUT OF 10	11-Nov-19
C-203	C-203 Comp (Old Joy)	17 OUT OF 20	11-Nov-19
C-201	C-201 Comp (Old Centac)	17 OUT OF 20	11-Nov-19
C-202	C-202 Comp (New Location)	17 OUT OF 20	11-Nov-19
new AC	INSTRUMENT AIR COMPRESSOR	18 OUT OF 18	11-Nov-19
201-08A	COMPRESSOR, NASH A 201-08A	16 OUT OF 16	11-Nov-19
9002-10	D-HYDROGENATOR AGITATOR	16 OUT OF 16	11-Nov-19
9003-01	D-HYDRO PRIMARY FILT FD PUMP	5 OUT OF 5	11-Nov-19
9001-01	D-HYDRO SECOND. FILT FD PUMP	5 OUT OF 5	11-Nov-19
192-03	Two Stage Water Pump A-WEST	5 OUT OF 5	11-Nov-19
191-07	M MIX BED WATER PUMP 191-07	5 OUT OF 5	11-Nov-19
2130-1old	C Concentrator Vacuum Pump	6 OUT OF 6	11-Nov-19

Missed Machine...

MACHINE ID	DESCRIPTION	
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9003-02	D-HYDRO RECYCLE PUMP	0 OUT OF 5
9002-01	D-HYDRO SPARE PUMP	0 OUT OF 5
191-13	E MIXED BED WATER PMP 191-13	0 OUT OF 5
191-14	W MIX BED WATER PUMP 191-14	0 OUT OF 5

Monitored Point Total = 169 OUT OF 213
 Monitored Machine Total = 14 OUT OF 21

Abbreviated Last Measurement Summary

Database: Arkema.rbm
Station: PEROXIDE
Route No. 4: ARK WK 2
Report Date: 11-Nov-19 12:57

MEASUREMENT POINT -----	OVERALL LEVEL -----	HFD / VHFD -----
7000-01 - AGITATOR, HYDROGENATOR C	(11-Nov-19)	
	OVERALL LEVEL	
01 - DRIVESHAFT BRG-NORTH-SOUTH	.043 In/Sec	
02 - DRIVESHAFT BRG-EAST-WEST	.045 In/Sec	
03 - DRIVESHAFT BRG-VERTICAL	.041 In/Sec	
11 - C Hydro Agitator MOTOR OB HORIZ	.041 In/Sec	
11H - MOTOR OB HORIZ - HI FREQ	.041 In/Sec	
12 - C Hydro Agitator MOTOR OB VERT	.047 In/Sec	
12H - MOTOR OB VERT - HI FREQ	.055 In/Sec	
13 - C Hydro Agitator Motor OB Axial	.044 In/Sec	
13H - MOTOR OB AXIAL - HI FREQ	.040 In/Sec	
21 - C Hydro Agitator MOTOR IB HORIZ	.045 In/Sec	
21H - MOTOR IB HORIZ - HI FREQ	.050 In/Sec	
22 - C Hydro Agitator MOTOR IB VERT	.061 In/Sec	
22H - MOTOR IB VERT - HI FREQ	.057 In/Sec	
23 - C Hydro Agitator Motor IB Axial	.054 In/Sec	
23H - MOTOR IB AXIAL - HI FREQ	.054 In/Sec	
31 - C Hydro Agitator GrBx In Horizon	.075 In/Sec	
32 - C Hydro Agitator GrBx In VERT	.175 In/Sec	
33 - C Hydro Agitator GrBx In Axial	.055 In/Sec	
41 - C Hydro Agitator GrBx Top Horizo	.051 In/Sec	
42 - C Hydro Agitator GrBx Top VERT	.042 In/Sec	
53 - C Hydro Agitator GrBx Top Axial	.115 In/Sec	
53L - C Hydro Agitator GrBx Top Axial	.105 In/Sec	
57 - A/B Concentr Vac Pmp-var RPM	(11-Nov-19)	
	OVERALL LEVEL	
11 - Motor OB HOR	.051 In/Sec	
	OVERALL LEVEL	1-20 KHz
11H - Motor OB HOR	.054 In/Sec	.136 G-s
12 - Motor OB VERT	.059 In/Sec	
12H - Motor OB VERT	.064 In/Sec	.372 G-s
13 - Motor OB AXIAL	.105 In/Sec	
21 - Motor IB HOR	.125 In/Sec	
23 - Motor IB AXIAL	.059 In/Sec	
71 - Compressor IB HOR	.167 In/Sec	
81 - Compressor OB Horiz	.246 In/Sec	
83 - Compressor OB Axial	.063 In/Sec	
2130-1 - FLASH VAP VAC PUMP-var speed	(11-Nov-19)	
	OVERALL LEVEL	
11 - Motor OB HOR	.059 In/Sec	
12 - Motor OB VERT	.030 In/Sec	

21	- Motor IB HOR	.038 In/Sec
22	- Motor IB VERT	.038 In/Sec
23	- Motor IB AXIAL	.050 In/Sec
71	- Compressor IB HOR	.063 In/Sec
72	- Compressor IB VERT	.070 In/Sec
81	- Compressor OB Horiz	.083 In/Sec
82	- Compressor OB VERT	.083 In/Sec
83	- Compressor OB Axial	.041 In/Sec

C-203 - C-203 Comp (Old Joy)

(11-Nov-19)

	OVERALL LEVEL	1-20 KHz
11 - MOTOR OB HOR	.088 In/Sec	1.558 G-s
12 - MOTOR OB VERT	.055 In/Sec	1.789 G-s
13 - MOTOR OB AXIAL	.043 In/Sec	1.103 G-s
21 - MOTOR IB HOR	.035 In/Sec	.601 G-s
22 - MOTOR IB VERT	.020 In/Sec	.265 G-s
23 - MOTOR IB AXIAL	.033 In/Sec	1.031 G-s
71M - COMP MALE SHAFT IB HOR	.031 In/Sec	
72M - COMP MALE SHAFT IB VERT	.044 In/Sec	
73M - COMP MALE SHAFT IB AXIAL	.050 In/Sec	
81M - COMP MALE SHAFT OB HOR	.055 In/Sec	
82M - COMP MALE SHAFT OB VERT	.062 In/Sec	
83M - COMP MALE SHAFT OB AXIAL	.031 In/Sec	
71F - COMP FEMALE SHAFT IB HOR	.041 In/Sec	
72F - COMP FEMALE SHAFT IB VERT	.040 In/Sec	
73F - COMP FEMALE SHAFT IB AXIAL	.071 In/Sec	
81F - COMP FEMALE SHAFT OB HOR	.037 In/Sec	
82F - COMP FEMALE SHAFT OB VERT	.047 In/Sec	

C-201 - C-201 Comp (Old Centac)

(11-Nov-19)

	OVERALL LEVEL	1-20 KHz
11 - MOTOR OB HOR	.094 In/Sec	2.041 G-s
12 - MOTOR OB VERT	.077 In/Sec	.425 G-s
13 - MOTOR OB AXIAL	.138 In/Sec	5.329 G-s
21 - MOTOR IB HOR	.086 In/Sec	.355 G-s
22 - MOTOR IB VERT	.037 In/Sec	.698 G-s
23 - MOTOR IB AXIAL	.060 In/Sec	1.039 G-s
71M - COMP MALE SHAFT IB HOR	.034 In/Sec	
72M - COMP MALE SHAFT IB VERT	.036 In/Sec	
73M - COMP MALE SHAFT IB AXIAL	.076 In/Sec	
81M - COMP MALE SHAFT OB HOR	.062 In/Sec	
82M - COMP MALE SHAFT OB VERT	.052 In/Sec	
83M - COMP MALE SHAFT OB AXIAL	.059 In/Sec	
71F - COMP FEMALE SHAFT IB HOR	.048 In/Sec	
72F - COMP FEMALE SHAFT IB VERT	.044 In/Sec	
73F - COMP FEMALE SHAFT IB AXIAL	.039 In/Sec	
81F - COMP FEMALE SHAFT OB HOR	.043 In/Sec	
82F - COMP FEMALE SHAFT OB VERT	.048 In/Sec	

C-202 - C-202 Comp (New Location)

(11-Nov-19)

	OVERALL LEVEL	1-20 KHz
11 - MOTOR OB HOR	.042 In/Sec	.670 G-s
12 - MOTOR OB VERT	.113 In/Sec	.878 G-s
13 - MOTOR OB AXIAL	.067 In/Sec	1.166 G-s
21 - MOTOR IB HOR	.051 In/Sec	.233 G-s
22 - MOTOR IB VERT	.052 In/Sec	.194 G-s
23 - MOTOR IB AXIAL	.034 In/Sec	.785 G-s

71M	- COMP MALE SHAFT IB HOR	.038 In/Sec
72M	- COMP MALE SHAFT IB VERT	.051 In/Sec
73M	- COMP MALE SHAFT IB AXIAL	.078 In/Sec
81M	- COMP MALE SHAFT OB HOR	.062 In/Sec
82M	- COMP MALE SHAFT OB VERT	.054 In/Sec
83M	- COMP MALE SHAFT OB AXIAL	.078 In/Sec
71F	- COMP FEMALE SHAFT IB HOR	.037 In/Sec
72F	- COMP FEMALE SHAFT IB VERT	.070 In/Sec
73F	- COMP FEMALE SHAFT IB AXIAL	.069 In/Sec
81F	- COMP FEMALE SHAFT OB HOR	.044 In/Sec
82F	- COMP FEMALE SHAFT OB VERT	.045 In/Sec

new AC - INSTRUMENT AIR COMPRESSOR

(11-Nov-19)

OVERALL LEVEL

1-20 KHz

11	- MOTOR OB HOR	.134 In/Sec	1.275 G-s
12	- MOTOR OB VERT	.100 In/Sec	.870 G-s
13	- MOTOR OB AXIAL	.067 In/Sec	.355 G-s
21	- MOTOR IB HOR	.155 In/Sec	.577 G-s
22	- MOTOR IB VERT	.092 In/Sec	.791 G-s
23	- MOTOR IB AXIAL	.058 In/Sec	.789 G-s
71M	- COMP MALE SHAFT IB HOR	.154 In/Sec	
72M	- COMP MALE SHAFT IB VERT	.123 In/Sec	
73M	- COMP MALE SHAFT IB AXIAL	.137 In/Sec	
81M	- COMP MALE SHAFT OB HOR	.189 In/Sec	
82M	- COMP MALE SHAFT OB VERT	.256 In/Sec	
83M	- COMP MALE SHAFT OB AXIAL	.199 In/Sec	
71F	- COMP FEMALE SHAFT IB HOR	.178 In/Sec	
72F	- COMP FEMALE SHAFT IB VERT	.153 In/Sec	
73F	- COMP FEMALE SHAFT IB AXIAL	.117 In/Sec	
81F	- COMP FEMALE SHAFT OB HOR	.156 In/Sec	
82F	- COMP FEMALE SHAFT OB VERT	.195 In/Sec	
83F	- COMP FEMALE SHAFT OB AXIAL	.158 In/Sec	

201-08A - COMPRESSOR, NASH A 201-08A

(11-Nov-19)

OVERALL LEVEL

11	- Nash Compr A Motor OB Horiz	.052 In/Sec
12	- Nash Compr A Motor OB Vertical	.069 In/Sec
12H	- Nash Compr A Motor OB Vertical	.071 In/Sec
13	- Nash Compr A Motor OB Axial	.094 In/Sec
21	- Nash Compr A Motor IB Horiz	.069 In/Sec
22	- Nash Compr A Motor IB VERT	.106 In/Sec
23	- Nash Compr A Motor IB AXIAL	.168 In/Sec
71	- Nash Compr A COMP IB HORIZ	.153 In/Sec
72	- Nash Compr A Compressor IB Verti	.186 In/Sec
72H	- Nash Compr A COMP IB Vertical	.199 In/Sec
73	- Nash Compr A COMP IB AXIAL	.145 In/Sec
81	- Nash Compr A COMP OB HORIZ	.124 In/Sec
82	- Nash Compr A Compressor OB Verti	.186 In/Sec
82H	- Nash Compr A COMP OB Vertical	.188 In/Sec
83	- Nash Compr A Compressor OB Axial	.109 In/Sec
83H	- Nash Compr A COMP OB AXIAL	.117 In/Sec

9002-10 - D-HYDROGENATOR AGITATOR

(11-Nov-19)

OVERALL LEVEL

11	- MOTOR OUTBOARD HORIZONTAL	.087 In/Sec
21	- MOTOR INBOARD HORIZONTAL	.070 In/Sec
23	- motor inboard axial	.053 In/Sec

31	- GEARBOX INPUT SHAFT -HORIZONTAL	.180 In/Sec
31H	- GEARBOX INPUT SHAFT -HORIZONTAL	.188 In/Sec
31L	- GEARBOX INPUT SHAFT-N-S-LOW FRQ	.215 In/Sec
51	- GEARBOX TOP PLATE- E-W	.288 In/Sec
51L	- GEARBOX OUTPUT SHAFT-E-W-LOW FRQ	.302 In/Sec
52	- GEARBOX TOP PLATE- N-S	.234 In/Sec
52L	- GEARBOX OUTPUT SHAFT-E-W-LOW FRQ	.253 In/Sec
53	- GEARBOX OUTPUT SHAFT -VERTICAL	.099 In/Sec
61	- GEARBOX OUTPUT SHAFT-HORIZONTAL	.092 In/Sec
61L	- GEARBOX OUTPUT SHAFT-E-W-LOW FRQ	.187 In/Sec
81	- AGIT INTERMED BRG @ SEAL- N-S	.056 In/Sec
82	- AGIT INTERMED BRG @ SEAL- E-W	.045 In/Sec
83	- AGIT INTERMED BRG @ SEAL- VERT	.029 In/Sec

9003-01	- D-HYDRO PRIMARY FILT FD PUMP	(11-Nov-19)
		OVERALL LEVEL
11	- MOTOR OUTBOARD HORIZONTAL	.059 In/Sec
21	- MOTOR INBOARD HORIZONTAL	.049 In/Sec
23	- MOTOR INBOARD AXIAL	.029 In/Sec
71	- PUMP HORIZONTAL	.111 In/Sec
72	- PUMP VERTICAL	.138 In/Sec

9001-01	- D-HYDRO SECOND. FILT FD PUMP	(11-Nov-19)
		OVERALL LEVEL
11	- MOTOR OUTBOARD HORIZONTAL	.047 In/Sec
21	- MOTOR INBOARD HORIZONTAL	.058 In/Sec
23	- MOTOR INBOARD AXIAL	.034 In/Sec
71	- PUMP HORIZONTAL	.077 In/Sec
72	- PUMP VERTICAL	.063 In/Sec

192-03	- Two Stage Water Pump A-WEST	(11-Nov-19)
		OVERALL LEVEL
11	- MOTOR OUTBOARD HORIZONTAL	.064 In/Sec
21	- MOTOR IB HORIZ	.135 In/Sec
23	- motor inboard axial	.062 In/Sec
71	- PUMP HORIZONTAL	.190 In/Sec
72	- PUMP VERTICAL	.058 In/Sec

191-07	- M MIX BED WATER PUMP 191-07	(11-Nov-19)
		OVERALL LEVEL
11	- Chilled H2O Pump Motor OB Horizo	.148 In/Sec
21	- Chilled H2O Pump Motor IB Horizo	.118 In/Sec
23	- MOTOR INBOARD	.059 In/Sec
71	- Chilled H2O Pump IB Horizontal	.214 In/Sec
72	- PUMP VERTICAL	.168 In/Sec

2130-1old	- C Concentrator Vacuum Pump	(11-Nov-19)
		OVERALL LEVEL
11	- Motor OB HOR	.058 In/Sec
21	- Motor IB HOR	.060 In/Sec
23	- Motor IB AXIAL	.236 In/Sec
71	- Compressor IB HOR	.122 In/Sec
81	- Compressor OB Horiz	.151 In/Sec
83	- Compressor OB Axial	.077 In/Sec

Clarification Of Vibration Units:

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