

September 27, 2019

ARKEMA

Subject: September week 4 vibration service report

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

No legitimate vibrations were found to be above 0.125"/sec velocity peak overall. Spectrum appears normal for unit. No action required.

**A/B Concentrator Vacuum Pump 57**

Vibrations increased again for the outboard pump bearing at what looks to be vane pass. Vibration has risen again and is at 0.31"/sec velocity peak overall. No immediate action is required at this time. **Rated a Class I Defect.**

**Flash Vacuum Pump 2130-1**

Vibrations in this unit appear normal. No actions required.

**Air Compressor C-201**

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 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**

Data sets for the gearbox bearings show overall vibrations have jumped to 0.419"/sec velocity peak. Shaft speed fundamental is below the accelerometer high pass filter. Vibrations of interest are around 11.33 and 10.52 and 278 HZ. Modulation is causing a slight beat vibration. Some of these peaks are most likely gear mesh. Gearbox and structure could be resonant. An internal inspection and oil analysis should be considered. Also, check the unit fasteners for tightness. **Rated a Class II Defect.** Please provide detailed information on the gearbox for further analysis.

**Instrument Air Compressor new**

Vibrations in this unit appear normal. No actions required.

**C Concentrator Vacuum Pump 2130-1 old**

Vibrations in this unit appear normal. No actions required.

**Monthly Equipment this Survey on report****Cooling Tower Fan Motors**

The following cooling tower fan motors slightly elevated vibrations at just over 0.3"/sec peak velocity. Inspect the units and drivetrain for issues defects or issues that could cause the increase. **Rated a Class I Defect.**

- North Cooling Tower, South Fan Motor
- South Cooling Tower, North and South Fan Motors

An Abbreviated Last Measurement Summary follows below:

**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**

Abbreviated Last Measurement Summary  
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Database: Arkema.rbm  
Station: PEROXIDE  
Route No. 5: ARK WK 3  
Report Date: 30-Sep-19 14:48

MEASUREMENT POINT -----	OVERALL LEVEL -----	HFD / VHFD -----
7000-01 - AGITATOR, HYDROGENATOR C	(27-Sep-19)	
	OVERALL LEVEL	
01 - DRIVESHAFT BRG-NORTH-SOUTH	.044 In/Sec	
02 - DRIVESHAFT BRG-EAST-WEST	.043 In/Sec	
03 - DRIVESHAFT BRG-VERTICAL	.038 In/Sec	
11 - C Hydro Agitator MOTOR OB HORIZ	.049 In/Sec	
11H - MOTOR OB HORIZ - HI FREQ	.043 In/Sec	
12 - C Hydro Agitator MOTOR OB VERT	.043 In/Sec	
12H - MOTOR OB VERT - HI FREQ	.049 In/Sec	
13 - C Hydro Agitator Motor OB Axial	.045 In/Sec	
13H - MOTOR OB AXIAL - HI FREQ	.042 In/Sec	
21 - C Hydro Agitator MOTOR IB HORIZ	.052 In/Sec	
21H - MOTOR IB HORIZ - HI FREQ	.045 In/Sec	
22 - C Hydro Agitator MOTOR IB VERT	.052 In/Sec	
22H - MOTOR IB VERT - HI FREQ	.049 In/Sec	
23 - C Hydro Agitator Motor IB Axial	.070 In/Sec	
23H - MOTOR IB AXIAL - HI FREQ	.073 In/Sec	
31 - C Hydro Agitator GrBx In Horizon	.078 In/Sec	
32 - C Hydro Agitator GrBx In VERT	.069 In/Sec	
33 - C Hydro Agitator GrBx In Axial	.050 In/Sec	
41 - C Hydro Agitator GrBx Top Horizo	.057 In/Sec	
42 - C Hydro Agitator GrBx Top VERT	.041 In/Sec	
53 - C Hydro Agitator GrBx Top Axial	.125 In/Sec	
53L - C Hydro Agitator GrBx Top Axial	.114 In/Sec	
57 - A/B Concentr Vac Pmp-var RPM	(27-Sep-19)	
	OVERALL LEVEL	
11 - Motor OB HOR	.054 In/Sec	
	OVERALL LEVEL	1-20 KHz
11H - Motor OB HOR	.054 In/Sec	.213 G-s
12 - Motor OB VERT	.051 In/Sec	
12H - Motor OB VERT	.050 In/Sec	.304 G-s
13 - Motor OB AXIAL	.069 In/Sec	
21 - Motor IB HOR	.055 In/Sec	
23 - Motor IB AXIAL	.068 In/Sec	
71 - Compressor IB HOR	.121 In/Sec	
81 - Compressor OB Horiz	.322 In/Sec	
83 - Compressor OB Axial	.086 In/Sec	
2130-1 - FLASH VAP VAC PUMP-var speed	(27-Sep-19)	
	OVERALL LEVEL	
11 - Motor OB HOR	.049 In/Sec	
12 - Motor OB VERT	.035 In/Sec	
21 - Motor IB HOR	.048 In/Sec	
22 - Motor IB VERT	.042 In/Sec	

23	- Motor IB AXIAL	.054 In/Sec
71	- Compressor IB HOR	.053 In/Sec
72	- Compressor IB VERT	.067 In/Sec
81	- Compressor OB Horiz	.070 In/Sec
82	- Compressor OB VERT	.085 In/Sec
83	- Compressor OB Axial	.041 In/Sec

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

(27-Sep-19)

	OVERALL LEVEL	1-20 KHz
11 - MOTOR OB HOR	.026 In/Sec	.284 G-s
12 - MOTOR OB VERT	.034 In/Sec	.729 G-s
13 - MOTOR OB AXIAL	.035 In/Sec	1.312 G-s
21 - MOTOR IB HOR	.023 In/Sec	.669 G-s
22 - MOTOR IB VERT	.025 In/Sec	.076 G-s
23 - MOTOR IB AXIAL	.046 In/Sec	.855 G-s
71M - COMP MALE SHAFT IB HOR	.031 In/Sec	
72M - COMP MALE SHAFT IB VERT	.055 In/Sec	
73M - COMP MALE SHAFT IB AXIAL	.052 In/Sec	
81M - COMP MALE SHAFT OB HOR	.052 In/Sec	
82M - COMP MALE SHAFT OB VERT	.060 In/Sec	
83M - COMP MALE SHAFT OB AXIAL	.035 In/Sec	
71F - COMP FEMALE SHAFT IB HOR	.038 In/Sec	
72F - COMP FEMALE SHAFT IB VERT	.058 In/Sec	
73F - COMP FEMALE SHAFT IB AXIAL	.052 In/Sec	
81F - COMP FEMALE SHAFT OB HOR	.034 In/Sec	
82F - COMP FEMALE SHAFT OB VERT	.084 In/Sec	

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

(27-Sep-19)

	OVERALL LEVEL	1-20 KHz
11 - MOTOR OB HOR	.042 In/Sec	.804 G-s
12 - MOTOR OB VERT	.128 In/Sec	.148 G-s
13 - MOTOR OB AXIAL	.050 In/Sec	1.359 G-s
21 - MOTOR IB HOR	.044 In/Sec	.227 G-s
22 - MOTOR IB VERT	.033 In/Sec	.119 G-s
23 - MOTOR IB AXIAL	.057 In/Sec	.419 G-s
71M - COMP MALE SHAFT IB HOR	.026 In/Sec	
72M - COMP MALE SHAFT IB VERT	.040 In/Sec	
73M - COMP MALE SHAFT IB AXIAL	.078 In/Sec	
81M - COMP MALE SHAFT OB HOR	.039 In/Sec	
82M - COMP MALE SHAFT OB VERT	.047 In/Sec	
83M - COMP MALE SHAFT OB AXIAL	.068 In/Sec	
71F - COMP FEMALE SHAFT IB HOR	.025 In/Sec	
72F - COMP FEMALE SHAFT IB VERT	.056 In/Sec	
73F - COMP FEMALE SHAFT IB AXIAL	.067 In/Sec	
81F - COMP FEMALE SHAFT OB HOR	.037 In/Sec	
82F - COMP FEMALE SHAFT OB VERT	.046 In/Sec	

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

(27-Sep-19)

	OVERALL LEVEL	1-20 KHz
11 - MOTOR OB HOR	.071 In/Sec	.683 G-s
12 - MOTOR OB VERT	.103 In/Sec	3.486 G-s
13 - MOTOR OB AXIAL	.044 In/Sec	.452 G-s
21 - MOTOR IB HOR	.100 In/Sec	.292 G-s
22 - MOTOR IB VERT	.035 In/Sec	.352 G-s
23 - MOTOR IB AXIAL	.056 In/Sec	.656 G-s
71M - COMP MALE SHAFT IB HOR	.051 In/Sec	
72M - COMP MALE SHAFT IB VERT	.035 In/Sec	

73M - COMP MALE SHAFT IB AXIAL	.071 In/Sec
81M - COMP MALE SHAFT OB HOR	.060 In/Sec
82M - COMP MALE SHAFT OB VERT	.050 In/Sec
83M - COMP MALE SHAFT OB AXIAL	.063 In/Sec
71F - COMP FEMALE SHAFT IB HOR	.042 In/Sec
72F - COMP FEMALE SHAFT IB VERT	.039 In/Sec
73F - COMP FEMALE SHAFT IB AXIAL	.042 In/Sec
81F - COMP FEMALE SHAFT OB HOR	.047 In/Sec
82F - COMP FEMALE SHAFT OB VERT	.049 In/Sec

9002-10 - D-HYDROGENATOR AGITATOR	(27-Sep-19)
	OVERALL LEVEL
11 - MOTOR OUTBOARD HORIZONTAL	.080 In/Sec
21 - MOTOR INBOARD HORIZONTAL	.068 In/Sec
23 - motor inboard axial	.078 In/Sec
31 - GEARBOX INPUT SHAFT -HORIZONTAL	.233 In/Sec
31H - GEARBOX INPUT SHAFT -HORIZONTAL	.255 In/Sec
31L - GEARBOX INPUT SHAFT-N-S-LOW FRQ	.259 In/Sec
51 - GEARBOX TOP PLATE- E-W	.285 In/Sec
51L - GEARBOX OUTPUT SHAFT-E-W-LOW FRQ	.323 In/Sec
52 - GEARBOX TOP PLATE- N-S	.419 In/Sec
52L - GEARBOX OUTPUT SHAFT-E-W-LOW FRQ	.279 In/Sec
53 - GEARBOX OUTPUT SHAFT -VERTICAL	.055 In/Sec
61 - GEARBOX OUTPUT SHAFT-HORIZONTAL	.145 In/Sec
61L - GEARBOX OUTPUT SHAFT-E-W-LOW FRQ	.228 In/Sec
81 - AGIT INTERMED BRG @ SEAL- N-S	.044 In/Sec
82 - AGIT INTERMED BRG @ SEAL- E-W	.042 In/Sec
83 - AGIT INTERMED BRG @ SEAL- VERT	.046 In/Sec

201-08A - COMPRESSOR,NASH A 201-08A	(27-Sep-19)
	OVERALL LEVEL
11 - Nash Compr A Motor OB Horiz	.053 In/Sec
12 - Nash Compr A Motor OB Vertical	.061 In/Sec
12H - Nash Compr A Motor OB Vertical	.061 In/Sec
13 - Nash Compr A Motor OB Axial	.093 In/Sec
21 - Nash Compr A Motor IB Horiz	.056 In/Sec
22 - Nash Compr A Motor IB VERT	.078 In/Sec
23 - Nash Compr A Motor IB AXIAL	.131 In/Sec
71 - Nash Compr A COMP IB HORIZ	.128 In/Sec
72 - Nash Compr A Compressor IB Verti	.186 In/Sec
72H - Nash Compr A COMP IB Vertical	.200 In/Sec
73 - Nash Compr A COMP IB AXIAL	.132 In/Sec
81 - Nash Compr A COMP OB HORIZ	.138 In/Sec
82 - Nash Compr A Compressor OB Verti	.229 In/Sec
82H - Nash Compr A COMP OB Vertical	.243 In/Sec
83 - Nash Compr A Compressor OB Axial	.124 In/Sec
83H - Nash Compr A COMP OB AXIAL	.146 In/Sec

NTC-SF - N CT-SOUTH FAN, N TWR	(27-Sep-19)
	OVERALL LEVEL
1 - MOTOR OB HORIZ	.331 In/Sec
2 - MOTOR IB HORIZ	.186 In/Sec
3 - MOTOR IB AXIAL	.175 In/Sec
4 - GEARBOX INPUT HORIZONTAL	.211 In/Sec
5 - GEARBOX VERTICAL	.0079 In/Sec
6 - GEARBOX AXIAL	.250 In/Sec
6L - GEARBOX AXIAL LOW FREQ	.237 In/Sec

NCT - NF	- N CT -NORTH FAN, N TWR	(27-Sep-19)
	OVERALL LEVEL	
7	- MOTOR OB HORIZ	.231 In/Sec
8	- MOTOR IB HORIZ	.156 In/Sec
9	- MOTOR IB AXIAL	.205 In/Sec
10	- GEARBOX INPUT HORIZONTAL	.152 In/Sec
11	- GEARBOX VERTICAL	.184 In/Sec
12	- GEARBOX AXIAL	.200 In/Sec
530-02	- PUMP,N.COOLING TWR,MIDDLE	(27-Sep-19)
	OVERALL LEVEL	
11	- MOT TOP N-S	.062 In/Sec
12	- MOTOR TOP E-W	.177 In/Sec
530-03	- PUMP,N.COOLING TWR,SOUTH	(27-Sep-19)
	OVERALL LEVEL	
11	- MOT TOP N-S	.109 In/Sec
12	- MOTOR TOP E-W	.134 In/Sec
548-7	- IRON-FREE H2O BOOSTER PUMP	(27-Sep-19)
	OVERALL LEVEL	
11	- MOTOR OUTBOARD HORIZONTAL	.026 In/Sec
21	- MOTOR INBOARD HORIZONTAL	.028 In/Sec
23	- MOTOR INBOARD AXIAL	.041 In/Sec
71	- PUMP HORIZONTAL	.059 In/Sec
72	- PUMP VERTICAL	.025 In/Sec
STC-NF	- S CT - NORTH FAN, S TWR	(27-Sep-19)
	OVERALL LEVEL	
1	- MOTOR OB HORIZ	.308 In/Sec
2	- MOTOR IB HORIZ	.229 In/Sec
3	- MOTOR IB AXIAL	.177 In/Sec
4	- GEARBOX INPUT HORIZONTAL	.319 In/Sec
6	- GEARBOX AXIAL	.189 In/Sec
STC-MF	- S CT - MID FAN, S TWR	(27-Sep-19)
	OVERALL LEVEL	
1	- MOTOR OB HORIZ	.263 In/Sec
2	- MOTOR IB HORIZ	.219 In/Sec
3	- MOTOR IB AXIAL	.125 In/Sec
4	- GEARBOX INPUT HORIZONTAL	.137 In/Sec
5	- GEARBOX VERTICAL	.111 In/Sec
6	- GEARBOX AXIAL	.110 In/Sec
STC-SF	- S CT - SOUTH FAN, S TWR	(27-Sep-19)
	OVERALL LEVEL	
1	- MOTOR OB HORIZ	.267 In/Sec
2	- MOTOR IB HORIZ	.304 In/Sec
3	- MOTOR IB AXIAL	.306 In/Sec
4	- GEARBOX INPUT HORIZONTAL	.195 In/Sec
5	- GEARBOX VERTICAL	.288 In/Sec
6	- GEARBOX AXIAL	.388 In/Sec
SCT-1	- SOUTH CT PUMP - EAST	(27-Sep-19)
	OVERALL LEVEL	
11	- MOTOR OUTBOARD HORIZONTAL	.039 In/Sec

21	- MOTOR INBOARD HORIZONTAL	.055 In/Sec
23	- MOTOR INBOARD AXIAL	.072 In/Sec
71	- PUMP HORIZONTAL	.220 In/Sec
72	- PUMP VERTICAL	.129 In/Sec

SCT-2	- SOUTH CT PUMP - MID	(27-Sep-19)
		OVERALL LEVEL
11	- MOTOR OUTBOARD HORIZONTAL	.038 In/Sec
21	- MOTOR INBOARD HORIZONTAL	.045 In/Sec
23	- MOTOR INBOARD AXIAL	.090 In/Sec
71	- PUMP HORIZONTAL	.157 In/Sec
72	- PUMP VERTICAL	.128 In/Sec

SCT-3	- SOUTH CT PUMP - WEST	(27-Sep-19)
		OVERALL LEVEL
11	- MOTOR OUTBOARD HORIZONTAL	.076 In/Sec
21	- MOTOR INBOARD HORIZONTAL	.043 In/Sec
23	- MOTOR INBOARD AXIAL	.070 In/Sec
71	- PUMP HORIZONTAL	.151 In/Sec
72	- PUMP VERTICAL	.231 In/Sec

new AC	- INSTRUMENT AIR COMPRESSOR	(27-Sep-19)	
		OVERALL LEVEL	1-20 KHz
11	- MOTOR OB HOR	.165 In/Sec	.813 G-s
12	- MOTOR OB VERT	.095 In/Sec	1.220 G-s
13	- MOTOR OB AXIAL	.062 In/Sec	.726 G-s
21	- MOTOR IB HOR	.198 In/Sec	2.243 G-s
22	- MOTOR IB VERT	.080 In/Sec	.879 G-s
23	- MOTOR IB AXIAL	.059 In/Sec	.908 G-s
71M	- COMP MALE SHAFT IB HOR	.165 In/Sec	
72M	- COMP MALE SHAFT IB VERT	.212 In/Sec	
73M	- COMP MALE SHAFT IB AXIAL	.265 In/Sec	
81M	- COMP MALE SHAFT OB HOR	.147 In/Sec	
82M	- COMP MALE SHAFT OB VERT	.330 In/Sec	
83M	- COMP MALE SHAFT OB AXIAL	.132 In/Sec	
71F	- COMP FEMALE SHAFT IB HOR	.261 In/Sec	
72F	- COMP FEMALE SHAFT IB VERT	.223 In/Sec	
73F	- COMP FEMALE SHAFT IB AXIAL	.120 In/Sec	
81F	- COMP FEMALE SHAFT OB HOR	.123 In/Sec	
82F	- COMP FEMALE SHAFT OB VERT	.245 In/Sec	
83F	- COMP FEMALE SHAFT OB AXIAL	.147 In/Sec	

2130-1old	- C Concentrator Vacuum Pump	(27-Sep-19)
		OVERALL LEVEL
11	- Motor OB HOR	.069 In/Sec
21	- Motor IB HOR	.051 In/Sec
23	- Motor IB AXIAL	.070 In/Sec
71	- Compressor IB HOR	.117 In/Sec
81	- Compressor OB Horiz	.132 In/Sec
83	- Compressor OB Axial	.158 In/Sec

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Clarification Of Vibration Units:

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