HI-SPEED INDUSTRIAL SERVICE

MILLINGTON, TN

December 30, 2019

ARKEMA

Subject: December week 4 vibration service report

Weekly Equipment

Agitator, Hydrogenator C 7001-01
No legitimate vibrations were found to be above 0.142”/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 dropped slightly for the outboard pump bearing and is at 0.064”/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. No actions required.

Air Compressor C-201
Rotor bar vibrations dropped two points to just over 5.7 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
Rotor bar vibrations increased to just over 3 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 NASH 201-08
Vibration data shows a decrease in the compressor inboard bearing measurement. The overall amplitude is at 0.25”/sec velocity peak. Spectrum shoes two dominant peaks; shaft speed and near 8 orders. We will keep a close eye on this unit. Ensure the unit gets proper lubrication in the near future. **Rated a Class I Defect**.

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D Hydrogenator Agitator 9002-10
Vibration data shows a slight decrease in vibrations this survey. Highest amplitude is at 0.298”/sec velocity peak for the gearbox top E/W measurement. Process variables are suspected for the change. **Still rated a Class I Defect Though.**

C Concentrator Vacuum Pump 2130-1 old
The motor axial vibration has dropped to 0.08”/sec velocity Peak. Check the shaft alignment only as time allows. **Rated a Class I Defect.**

South Cooling Tower, South Fan
The unit axial has jumped up to over 0.4’/sec velocity peak. Inspect the drivetrain for issues.
Rated a Class 1

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

Database: Arkema.rbm
Station: PEROXIDE
Route No. 5: ARK WK 3
Report Date: 30-Dec-19 14:25

MEASUREMENT POINT		OVERALL LEVEL	HFD / VHFD
7000-01	- AGITATOR,HYDROGENATOR C	(30-Dec-19)	
		OVERALL LEVEL	
01	- DRIVESHAFT BRG-NORTH-SOUTH	.062 In/Sec	
02	- DRIVESHAFT BRG-EAST-WEST	.059 In/Sec	
03	- DRIVESHAFT BRG-VERTICAL	.048 In/Sec	
11	- C Hydro Agitator MOTOR OB HORIZ	.039 In/Sec	
12	- C Hydro Agitator MOTOR OB VERT	.051 In/Sec	
13	- C Hydro Agitator Motor OB Axial	.049 In/Sec	
21	- C Hydro Agitator MOTOR IB HORIZ	.053 In/Sec	
22	- C Hydro Agitator MOTOR IB VERT	.062 In/Sec	
23	- C Hydro Agitator Motor IB Axial	.075 In/Sec	
31	- C Hydro Agitator GrBx In Horizon	.076 In/Sec	
32	- C Hydro Agitator GrBx In VERT	.080 In/Sec	
33	- C Hydro Agitator GrBx In Axial	.044 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	.142 In/Sec	
53L	- C Hydro Agitator GrBx Top Axial	.136 In/Sec	
57	- A/B Concentr Vac Pmp-var RPM	(30-Dec-19)	
		OVERALL LEVEL	
11	- Motor OB HOR	.060 In/Sec	
12	- Motor OB VERT	.066 In/Sec	
21	- Motor IB HOR	.094 In/Sec	
23	- Motor IB AXIAL	.066 In/Sec	
71	- Compressor IB HOR	.173 In/Sec	
81	- Compressor OB Horiz	.064 In/Sec	
83	- Compressor OB Axial	.026 In/Sec	
2130-1	- FLASH VAP VAC PUMP-var speed	(30-Dec-19)	
		OVERALL LEVEL	
11	- Motor OB HOR	.045 In/Sec	
12	- Motor OB VERT	.033 In/Sec	
21	- Motor IB HOR	.045 In/Sec	
22	- Motor IB VERT	.048 In/Sec	
23	- Motor IB AXIAL	.054 In/Sec	
71	- Compressor IB HOR	.063 In/Sec	
72	- Compressor IB VERT	.086 In/Sec	
81	- Compressor OB Horiz	.076 In/Sec	
82	- Compressor OB VERT	.097 In/Sec	
83	- Compressor OB Axial	.053 In/Sec	
C-203	- C-203 Comp	(30-Dec-19)	
		OVERALL LEVEL	1-20 KHz
11	- MOTOR OB HOR	.081 In/Sec	3.150 G-s

12	– MOTOR OB VERT	.028 In/Sec	.829 G-s
21	– MOTOR IB HOR	.024 In/Sec	.647 G-s
22	– MOTOR IB VERT	.050 In/Sec	1.861 G-s
23	– MOTOR IB AXIAL	.031 In/Sec	1.268 G-s
71M	– COMP MALE SHAFT IB HOR	.043 In/Sec	
72M	– COMP MALE SHAFT IB VERT	.037 In/Sec	
73M	– COMP MALE SHAFT IB AXIAL	.064 In/Sec	
81M	– COMP MALE SHAFT OB HOR	.035 In/Sec	
82M	– COMP MALE SHAFT OB VERT	.051 In/Sec	
71F	– COMP FEMALE SHAFT IB HOR	.048 In/Sec	
72F	– COMP FEMALE SHAFT IB VERT	.057 In/Sec	
73F	– COMP FEMALE SHAFT IB AXIAL	.066 In/Sec	
81F	– COMP FEMALE SHAFT OB HOR	.044 In/Sec	
82F	– COMP FEMALE SHAFT OB VERT	.045 In/Sec	

C-202 – C-202 Comp (30-Dec-19)

		OVERALL LEVEL	1-20 KHz
11	– MOTOR OB HOR	.056 In/Sec	1.664 G-s
12	– MOTOR OB VERT	.114 In/Sec	.499 G-s
21	– MOTOR IB HOR	.070 In/Sec	.534 G-s
22	– MOTOR IB VERT	.082 In/Sec	1.121 G-s
23	– MOTOR IB AXIAL	.061 In/Sec	1.190 G-s
71M	– COMP MALE SHAFT IB HOR	.043 In/Sec	
72M	– COMP MALE SHAFT IB VERT	.053 In/Sec	
73M	– COMP MALE SHAFT IB AXIAL	.084 In/Sec	
81M	– COMP MALE SHAFT OB HOR	.060 In/Sec	
82M	– COMP MALE SHAFT OB VERT	.059 In/Sec	
71F	– COMP FEMALE SHAFT IB HOR	.034 In/Sec	
72F	– COMP FEMALE SHAFT IB VERT	.056 In/Sec	
73F	– COMP FEMALE SHAFT IB AXIAL	.076 In/Sec	
81F	– COMP FEMALE SHAFT OB HOR	.046 In/Sec	
82F	– COMP FEMALE SHAFT OB VERT	.048 In/Sec	

C-201 – C-201 Comp (30-Dec-19)

		OVERALL LEVEL	1-20 KHz
11	– MOTOR OB HOR	.129 In/Sec	3.835 G-s
12	– MOTOR OB VERT	.096 In/Sec	1.306 G-s
21	– MOTOR IB HOR	.112 In/Sec	3.088 G-s
22	– MOTOR IB VERT	.075 In/Sec	1.961 G-s
23	– MOTOR IB AXIAL	.155 In/Sec	5.746 G-s
71M	– COMP MALE SHAFT IB HOR	.052 In/Sec	
72M	– COMP MALE SHAFT IB VERT	.053 In/Sec	
73M	– COMP MALE SHAFT IB AXIAL	.082 In/Sec	
81M	– COMP MALE SHAFT OB HOR	.032 In/Sec	
82M	– COMP MALE SHAFT OB VERT	.052 In/Sec	
71F	– COMP FEMALE SHAFT IB HOR	.041 In/Sec	
72F	– COMP FEMALE SHAFT IB VERT	.052 In/Sec	
73F	– COMP FEMALE SHAFT IB AXIAL	.060 In/Sec	
81F	– COMP FEMALE SHAFT OB HOR	.062 In/Sec	
82F	– COMP FEMALE SHAFT OB VERT	.059 In/Sec	

9002-10 – D-HYDROGENATOR AGITATOR (30-Dec-19)

		OVERALL LEVEL
11	– MOTOR OUTBOARD HORIZONTAL	.098 In/Sec
21	– MOTOR INBOARD HORIZONTAL	.068 In/Sec
23	– motor inboard axial	.053 In/Sec
31	– GEARBOX INPUT SHAFT -HORIZONTAL	.179 In/Sec

31L	– GEARBOX INPUT SHAFT–N–S–LOW FRQ	.179 In/Sec	
51	– GEARBOX TOP PLATE– E–W	.298 In/Sec	
51L	– GEARBOX OUTPUT SHAFT–E–W–LOW FRQ	.256 In/Sec	
52	– GEARBOX TOP PLATE– N–S	.261 In/Sec	
52L	– GEARBOX OUTPUT SHAFT–E–W–LOW FRQ	.244 In/Sec	
53	– GEARBOX OUTPUT SHAFT –VERTICAL	.137 In/Sec	
61	– GEARBOX OUTPUT SHAFT–HORIZONTAL	.223 In/Sec	
61L	– GEARBOX OUTPUT SHAFT–E–W–LOW FRQ	.236 In/Sec	
81	– AGIT INTERMED BRG @ SEAL– N–S	.038 In/Sec	
82	– AGIT INTERMED BRG @ SEAL– E–W	.046 In/Sec	
83	– AGIT INTERMED BRG @ SEAL– VERT	.043 In/Sec	

201–08A	– COMPRESSOR,NASH A 201–08A	(30–Dec–19)	
		OVERALL LEVEL	
11	– Nash Compr A Motor OB Horiz	.057 In/Sec	
12	– Nash Compr A Motor OB Vertical	.077 In/Sec	
13	– Nash Compr A Motor OB Axial	.162 In/Sec	
21	– Nash Compr A Motor IB Horiz	.113 In/Sec	
22	– Nash Compr A Motor IB VERT	.156 In/Sec	
23	– Nash Compr A Motor IB AXIAL	.182 In/Sec	
71	– Nash Compr A COMP IB HORIZ	.210 In/Sec	
72	– Nash Compr A Compressor IB Verti	.289 In/Sec	
73	– Nash Compr A COMP IB AXIAL	.159 In/Sec	
81	– Nash Compr A COMP OB HORIZ	.156 In/Sec	
82	– Nash Compr A Compressor OB Verti	.281 In/Sec	
83	– Nash Compr A Compressor OB Axial	.155 In/Sec	

NTC–SF	– N CT–SOUTH FAN, N TWR	(30–Dec–19)	
		OVERALL LEVEL	
1	– MOTOR OB HORIZ	.075 In/Sec	
2	– MOTOR IB HORIZ	.063 In/Sec	
3	– MOTOR IB AXIAL	.095 In/Sec	
4	– GEARBOX INPUT HORIZONTAL	.193 In/Sec	
5	– GEARBOX VERTICAL	.0026 In/Sec	
6	– GEARBOX AXIAL	.112 In/Sec	
6L	– GEARBOX AXIAL LOW FREQ	.302 In/Sec	

NCT – NF	– N CT –NORTH FAN, N TWR	(30–Dec–19)	
		OVERALL LEVEL	
7	– MOTOR OB HORIZ	.114 In/Sec	
8	– MOTOR IB HORIZ	.080 In/Sec	
9	– MOTOR IB AXIAL	.395 In/Sec	
10	– GEARBOX INPUT HORIZONTAL	.127 In/Sec	
11	– GEARBOX VERTICAL	.502 In/Sec	suspect measurement
12	– GEARBOX AXIAL	.112 In/Sec	

530–02	– PUMP,N.COOLING TWR,MIDDLE	(30–Dec–19)	
		OVERALL LEVEL	
11	– MOT TOP N–S	.120 In/Sec	
12	– MOTOR TOP E–W	.158 In/Sec	

530–03	– PUMP,N.COOLING TWR,SOUTH	(30–Dec–19)	
		OVERALL LEVEL	
11	– MOT TOP N–S	.112 In/Sec	
12	– MOTOR TOP E–W	.149 In/Sec	

548–7	– IRON–FREE H2O BOOSTER PUMP	(30–Dec–19)

		OVERALL LEVEL
11	– MOTOR OUTBOARD HORIZONTAL	.045 In/Sec
21	– MOTOR INBOARD HORIZONTAL	.043 In/Sec
23	– MOTOR INBOARD AXIAL	.054 In/Sec
71	– PUMP HORIZONTAL	.045 In/Sec
72	– PUMP VERTICAL	.028 In/Sec

STC-NF	– S CT – NORTH FAN, S TWR	(30-Dec-19)
		OVERALL LEVEL
1	– MOTOR OB HORIZ	.031 In/Sec
2	– MOTOR IB HORIZ	.027 In/Sec
3	– MOTOR IB AXIAL	.065 In/Sec
4	– GEARBOX INPUT HORIZONTAL	.044 In/Sec
6	– GEARBOX AXIAL	.242 In/Sec

STC-MF	– S CT – MID FAN, S TWR	(30-Dec-19)
		OVERALL LEVEL
1	– MOTOR OB HORIZ	.289 In/Sec
2	– MOTOR IB HORIZ	.244 In/Sec
3	– MOTOR IB AXIAL	.134 In/Sec
4	– GEARBOX INPUT HORIZONTAL	.272 In/Sec
5	– GEARBOX VERTICAL	.090 In/Sec
6	– GEARBOX AXIAL	.106 In/Sec

STC-SF	– S CT – SOUTH FAN, S TWR	(30-Dec-19)
		OVERALL LEVEL
1	– MOTOR OB HORIZ	.283 In/Sec
2	– MOTOR IB HORIZ	.340 In/Sec
3	– MOTOR IB AXIAL	.521 In/Sec
4	– GEARBOX INPUT HORIZONTAL	.226 In/Sec
5	– GEARBOX VERTICAL	.302 In/Sec
6	– GEARBOX AXIAL	.413 In/Sec

SCT-1	– SOUTH CT PUMP – EAST	(30-Dec-19)
		OVERALL LEVEL
11	– MOTOR OUTBOARD HORIZONTAL	.033 In/Sec
21	– MOTOR INBOARD HORIZONTAL	.060 In/Sec
23	– MOTOR INBOARD AXIAL	.079 In/Sec
71	– PUMP HORIZONTAL	.137 In/Sec
72	– PUMP VERTICAL	.072 In/Sec

SCT-2	– SOUTH CT PUMP – MID	(30-Dec-19)
		OVERALL LEVEL
11	– MOTOR OUTBOARD HORIZONTAL	.039 In/Sec
21	– MOTOR INBOARD HORIZONTAL	.045 In/Sec
23	– MOTOR INBOARD AXIAL	.087 In/Sec
71	– PUMP HORIZONTAL	.173 In/Sec
72	– PUMP VERTICAL	.099 In/Sec

SCT-3	– SOUTH CT PUMP – WEST	(30-Dec-19)
		OVERALL LEVEL
11	– MOTOR OUTBOARD HORIZONTAL	.030 In/Sec
21	– MOTOR INBOARD HORIZONTAL	.043 In/Sec
23	– MOTOR INBOARD AXIAL	.097 In/Sec
71	– PUMP HORIZONTAL	.225 In/Sec
72	– PUMP VERTICAL	.189 In/Sec

new AC	- INSTRUMENT AIR COMPRESSOR	(30-Dec-19)	
		OVERALL LEVEL	1-20 KHz
11	- MOTOR OB HOR	.141 In/Sec	.646 G-s
12	- MOTOR OB VERT	.107 In/Sec	.852 G-s
13	- MOTOR OB AXIAL	.065 In/Sec	.634 G-s
21	- MOTOR IB HOR	.195 In/Sec	.559 G-s
22	- MOTOR IB VERT	.091 In/Sec	.832 G-s
23	- MOTOR IB AXIAL	.088 In/Sec	.908 G-s
71F	- COMP FEMALE SHAFT IB HOR	.202 In/Sec	
72F	- COMP FEMALE SHAFT IB VERT	.164 In/Sec	
73F	- COMP FEMALE SHAFT IB AXIAL	.142 In/Sec	
81F	- COMP FEMALE SHAFT OB HOR	.140 In/Sec	
82F	- COMP FEMALE SHAFT OB VERT	.219 In/Sec	
83F	- COMP FEMALE SHAFT OB AXIAL	.134 In/Sec	
71M	- COMP MALE SHAFT IB HOR	.145 In/Sec	
72M	- COMP MALE SHAFT IB VERT	.152 In/Sec	
73M	- COMP MALE SHAFT IB AXIAL	.175 In/Sec	
81M	- COMP MALE SHAFT OB HOR	.162 In/Sec	
82M	- COMP MALE SHAFT OB VERT	.168 In/Sec	
83M	- COMP MALE SHAFT OB AXIAL	.195 In/Sec	

2130-1old	- C Concentrator Vacuum Pump	(30-Dec-19)	
		OVERALL LEVEL	
11	- Motor OB HOR	.059 In/Sec	
21	- Motor IB HOR	.067 In/Sec	
23	- Motor IB AXIAL	.099 In/Sec	
71	- Compressor IB HOR	.142 In/Sec	
81	- Compressor OB Horiz	.175 In/Sec	
83	- Compressor OB Axial	.098 In/Sec	

Clarification Of Vibration Units:

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