

October 14, 2019

ARKEMA

Subject: October week 2 vibration service report

# Weekly Equipment

# Agitator, Hydrogenator C 7001-01

No legitimate vibrations were found to be above 0.128"/sec velocity peak overall. Spectrum appears normal for unit. No action required.

# A/B Concentrator Vacuum Pump 57

Overall vibrations have jumped for the outboard pump bearing and is at 0.461"/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

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.

7030 Ryburn Drive Millington, TN 38053 P. 901-873-5300 F. 901-873-5301

## D Hydrogenator Agitator 9002-10

Data sets for the gearbox bearings show overall vibrations have increased again to 0.414"/sec velocity peak. Shaft speed fundamental is below the accelerometer high pass filter. Vibrations of interest are around 11.33 and10.52 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

#### Middle Mix Bed Water Pump 191-07

Dominant vibrations are still at shaft speed and 5X shaft speed; however they have dropped. Inspect the coupling and alignment and check to make sure pump is operating in the optimal part of the flow curve. Last, check the pump for wear. **Rated a Class I Defect.** 

Most week 2 route monthly equipment surveyed had normal vibrations. Their measurements are included 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 dshook@gohispeed.com *Hi-Speed* Industrial Service

# Abbreviated Last Measurement Summary

Database: Arkema.rbm Station: PEROXIDE Route No. 4: ARK WK 2 Report Date: 14-Oct-19 13:11

MEASUREMENT POINT

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7000-01 - AGITATOR, HYDROGENATOR C	(11-Oct-19)	
	OVERALL LEVEL	
01 - DRIVESHAFT BRG-NORTH-SOUTH	.051 In/Sec	
02 - DRIVESHAFT BRG-EAST-WEST	.038 In/Sec	
03 - DRIVESHAFT BRG-VERTICAL	.039 In/Sec	
11 - C Hydro Agitator MOTOR OB HORIZ	.058 In/Sec	
11H - MOTOR OB HORIZ - HI FREO	.041 In/Sec	
12 - C Hydro Agitator MOTOR OB VERT	.035 In/Sec	
12H - MOTOR OB VERT - HI FREO	.047 In/Sec	
13 - C Hydro Agitator Motor OB Axial	.041 In/Sec	
13H - MOTOR OB AXIAL - HI FREO	.037 In/Sec	
21 - C Hydro Agitator MOTOR IB HORIZ	062 In/Sec	
21H - MOTOR TE HORIZ - HI FREO	040 Tr/Sec	
22 - C Hydro Agitator MOTOR IB VERT	064 Tn/Sec	
22H - MOTOR TR VERT - HI FRED	050 In/Sec	
23 - C Hydro Agitator Motor TB Axial	059 In/Sec	
23H - MOTOR TE AXIAL - HI FREO	059 In/Sec	
31 - C Hydro Agitator GrBy In Horizon	070 In/Sec	
32 - C Hudro Agitator GrBy In NORIZON	.070 IN/Sec	
33 - C Hudro Agitator GrBy In Avial	.000 IN/Sec	
11 - C Hudro Agitator GrBx Ton Horizo	073 In/Sec	
41 - C Hydro Agitator GIBX TOP MOTIZO 42 - C Hydro Agitator CrPy Top WEPT		
42 - C Hydro Agitator GIBX TOP VERI	129 Tp/Sec	
53 - C Hydro Agitator GrBx Top Axial	120 IN/Sec	
SSL - C Hydro Agitator Grbx rop Axiar	.122 111/560	
57 - A/B Concentr Vac Pmp-war BPM	(11 - 0c + -19)	
57 K/D concenci vac rmp var Nik	OVERALL LEVEL	
11 - Motor OB HOP		
II - MOCOI OB NOR	OVERALL LEVEL	1_20 847
114 - Motor OP HOP		125 C-c
12 - Motor OP WEPT	.049 IN/Sec	.155 G-S
12 - Motor OB VERI	.056 In/Sec	294 C-a
21 - Motor TP HOP	197 Tp/Sec	.204 G-S
22 Motor IB HOR	.197 IN/Sec	
ZS - MOLOF IB AXIAL	.057 IN/Sec	
71 - Compressor IB HOR	.16/ In/Sec	
81 - Compressor OB Horiz	.461 In/Sec	
83 - Compressor OB Axial	.070 In/Sec	
2120 1 FIACH WAD WAC DUMD war groad	(11  Ort  10)	
2130-1 - FLASH VAP VAC POMP-Var speed		
11 Notor OF HOP	OVERALL LEVEL	
11 - MOLOF UB HUK	.050 IN/Sec	
12 - MOTOF UB VERT	.030 IN/Sec	
21 - MOTOR IB HUK	.034 IN/SeC	
ZZ - MOTOT IB VERT	.044 IN/Sec	

23 - Motor IB AXIAL .048 In/Sec

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OVERALL LEVEL HFD / VHFD

	71 - Compressor IB HOR	055 In/Sec	
	72 - Compressor IB VERT	067 In/Sec	
	81 - Compressor OB Horiz	072 In/Sec	
	82 - Compressor OB VERT	083 In/Sec	
	83 - Compressor OB Axial	035 In/Sec	
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	C-203 - C-203 Comp (Old Jov)	(11 - 0ct - 19)	
		OVERALL LEVEL	1-20 KHz
	11 - MOTOR OB HOR	.025 In/Sec	1.094 G-s
	12 - MOTOR OB VERT	.039 In/Sec	.626 G-s
	13 - MOTOR OB AXIAL	.050 In/Sec	1.892 G-s
	21 - MOTOR IB HOR	.015 In/Sec	.127 G-s
	22 - MOTOR IB VERT	.022 In/Sec	.165 G-s
	23 - MOTOR IB AXIAL	.033 In/Sec	.537 G-s
	71M - COMP MALE SHAFT IB HOR	.028 In/Sec	
	72M - COMP MALE SHAFT IB VERT	.041 In/Sec	
	73M - COMP MALE SHAFT IB AXIAL	.075 In/Sec	
	81M - COMP MALE SHAFT OB HOR	.037 In/Sec	
	82M - COMP MALE SHAFT OB VERT	.032 In/Sec	
	83M - COMP MALE SHAFT OB AXIAL	.033 In/Sec	
	71F - COMP FEMALE SHAFT IB HOR	.042 In/Sec	
	72F - COMP FEMALE SHAFT IB VERT	.061 In/Sec	
	73F - COMP FEMALE SHAFT IB AXIAL	.075 In/Sec	
	81F - COMP FEMALE SHAFT OB HOR	.028 In/Sec	
	82F - COMP FEMALE SHAFT OB VERT	.041 In/Sec	
	C-201 - C-201 Comp (Old Centac)	(14-Oct-19)	
		OVERALL LEVEL	1-20 KHz
*	11 - MOTOR OB HOR	.097 In/Sec	.603 G-s
*	12 - MOTOR OB VERT	.159 In/Sec	5.162 G-s
*	13 - MOTOR OB AXIAL	.049 In/Sec	.155 G-s
*	21 - MOTOR IB HOR	.096 In/Sec	.258 G-s
*	22 - MOTOR IB VERT	.061 In/Sec	.176 G-s
*	23 - MOTOR IB AXIAL	.111 In/Sec	3.967 G-s
*	71M - COMP MALE SHAFT IB HOR	.029 In/Sec	
*	72M - COMP MALE SHAFT IB VERT	.028 In/Sec	
*	73M - COMP MALE SHAFT IB AXIAL	.080 In/Sec	
*	81M - COMP MALE SHAFT OB HOR	.055 In/Sec	
*	82M - COMP MALE SHAFT OB VERT	.045 In/Sec	
*	83M - COMP MALE SHAFT OB AXIAL	.073 In/Sec	
	71F - COMP FEMALE SHAFT IB HOR	.036 In/Sec	
	72F - COMP FEMALE SHAFT IB VERT	.043 In/Sec	
	73F - COMP FEMALE SHAFT IB AXIAL	.048 In/Sec	
	81F - COMP FEMALE SHAFT OB HOR	.045 In/Sec	
	82F - COMP FEMALE SHAFT OB VERT	.054 In/Sec	
		(11 0-+ 10)	
	$c_{202} = c_{202} \operatorname{comp}(\text{New Location})$	(II-OCL-I9)	1_20 884
		029 In/Sec	395 C-c
	12 - MOTOR OB VERT	105  Tr/Sec	681 C-2
	13 - MOTOR OB AXIAL	058  Tr/Sec	1 162 C-e
	21 - MOTOR TB HOR	063  Tr/Sec	1.102 G-S
	22 - MOTOR TB VERT	058  Tr/Sec	343 C-e
	23 - MOTOR TB AXTAL	050  Tr/Sec	127 C-e
	71M - COMD MALE SHAFT TE HOD	040  Tr/Sec	.12/ 6-5
	72M - COMP MALE SHAFT ID NOR 72M - COMD MALE SHAFT ID VEDT	047  Tr/Sec	
	73M - COMP MALE SHAFT ID VERI	072  Tr/Sec	
	OFF PALE SHAFT ID ANTAL	.0/2 11/300	

81M - COMP MALE SHAFT OB HOR.047 In/Sec82M - COMP MALE SHAFT OB VERT.050 In/Sec83M - COMP MALE SHAFT OB AXIAL.072 In/Sec71F - COMP FEMALE SHAFT IB HOR.028 In/Sec72F - COMP FEMALE SHAFT IB VERT.049 In/Sec73F - COMP FEMALE SHAFT IB AXIAL.064 In/Sec81F - COMP FEMALE SHAFT OB HOR.036 In/Sec82F - COMP FEMALE SHAFT OB VERT.048 In/Sec - INSTRUMENT AIR COMPRESSOR (14-Oct-19) new AC OVERALL LEVEL1-20 KHz11 - MOTOR OB HOR.149 In/Sec.464 G-s12 - MOTOR OB VERT.101 In/Sec1.004 G-s13 - MOTOR OB AXIAL.063 In/Sec.746 G-s21 - MOTOR IB HOR.122 In/Sec1.000 G-s22 - MOTOR IB VERT.074 In/Sec1.078 G-s23 - MOTOR IB AXIAL.291 In/Sec1.175 G-s71M - COMP MALE SHAFT IB HOR.120 In/Sec72M - COMP MALE SHAFT IB VERT.162 In/Sec73M - COMP MALE SHAFT OB HOR.179 In/Sec81M - COMP MALE SHAFT OB VERT.203 In/Sec71F - COMP MALE SHAFT OB AXIAL.203 In/Sec71F - COMP FEMALE SHAFT IB HOR.190 In/Sec72F - COMP FEMALE SHAFT IB AXIAL.159 In/Sec73F - COMP FEMALE SHAFT OB HOR.157 In/Sec81F - COMP FEMALE SHAFT OB HOR.157 In/Sec82F - COMP FEMALE SHAFT OB VERT.256 In/Sec83F - COMP FEMALE SHAFT OB AXIAL.264 In/Sec OVERALL LEVEL 1-20 KHz - COMPRESSOR, NASH A 201-08A (14-Oct-19) 201-08A OVERALL LEVEL OVERALL LEVEL11- Nash Compr A Motor OB Horiz.061 In/Sec12- Nash Compr A Motor OB Vertical.070 In/Sec12H - Nash Compr A Motor OB Vertical.066 In/Sec13- Nash Compr A Motor OB Axial.128 In/Sec21- Nash Compr A Motor IB Horiz.056 In/Sec22- Nash Compr A Motor IB VERT.097 In/Sec23- Nash Compr A Motor IB VERT.097 In/Sec23- Nash Compr A Motor IB AXIAL.134 In/Sec71- Nash Compr A COMP IB HORIZ.138 In/Sec72- Nash Compr A COMP IB Vertical.205 In/Sec73- Nash Compr A COMP IB Vertical.206 In/Sec73- Nash Compr A COMP OB HORIZ.146 In/Sec81- Nash Compr A COMP OB HORIZ.146 In/Sec82- Nash Compr A COMP OB Vertical.242 In/Sec83- Nash Compr A COMP OB AXIAL.130 In/Sec - D-HYDROGENATOR AGITATOR (14-Oct-19) 9002-10 10DefinitionDefinition(14-Oct-19)11- MOTOR OUTBOARD HORIZONTAL.103 In/Sec21- MOTOR INBOARD HORIZONTAL.083 In/Sec23- motor inboard axial.067 In/Sec31- GEARBOX INPUT SHAFT -HORIZONTAL.277 In/Sec31L - GEARBOX INPUT SHAFT -N-S-LOW FRQ.290 In/Sec

.240 In/Sec 51 - GEARBOX TOP PLATE- E-W .208 In/Sec 51L - GEARBOX OUTPUT SHAFT-E-W-LOW FRQ .414 In/Sec - GEARBOX TOP PLATE- N-S 52 -.414 In/Sec .339 In/Sec .068 In/Sec .273 In/Sec .045 In/Sec .044 In/Sec 52L - GEARBOX OUTPUT SHAFT-E-W-LOW FRQ 53 - GEARBOX OUTPUT SHAFT -VERTICAL 61 - GEARBOX OUTPUT SHAFT-HORIZONTAL 61L - GEARBOX OUTPUT SHAFT-E-W-LOW FRQ 81 - AGIT INTERMED BRG @ SEAL- N-S 82 - AGIT INTERMED BRG @ SEAL- E-W 83 - AGIT INTERMED BRG @ SEAL- VERT .034 In/Sec 9003-01 - D-HYDRO PRIMARY FILT FD PUMP (14-Oct-19) OVERALL LEVEL 11 - MOTOR OUTBOARD HORIZONTAL .070 In/Sec 21 - MOTOR INBOARD HORIZONTAL .040 In/Sec - MOTOR INBOARD AXIAL .054 In/Sec 23 71 - PUMP HORIZONTAL .109 In/Sec 72 - PUMP VERTICAL .121 In/Sec 9001-01 - D-HYDRO SECOND. FILT FD PUMP (14-Oct-19) OVERALL LEVEL .057 In/Sec 11 - MOTOR OUTBOARD HORIZONTAL 21 - MOTOR INBOARD HORIZONTAL .046 In/Sec 23 - MOTOR INBOARD AXIAL .039 In/Sec 71 - PUMP HORIZONTAL .092 In/Sec 72 - PUMP VERTICAL .078 In/Sec 192-03 - Two Stage Water Pump A-WEST (14-Oct-19) OVERALL LEVEL .070 In/Sec 11 - MOTOR OUTBOARD HORIZONTAL .096 In/Sec 21 - MOTOR IB HORIZ .057 In/Sec - motor inboard axial 23 71 - PUMP HORIZONTAL .169 In/Sec 72 - PUMP VERTICAL .058 In/Sec 191-07 - M MIX BED WATER PUMP 191-07 (14-Oct-19) OVERALL LEVEL .141 In/Sec 11 - Chilled H2O Pump Motor OB Horizo 21 - Chilled H2O Pump Motor IB Horizo .106 In/Sec 23 - MOTOR INBOARD .062 In/Sec .312 In/Sec 71 - Chilled H2O Pump IB Horizontal 72 - PUMP VERTICAL .132 In/Sec 2130-1old - C Concentrator Vacuum Pump (14-Oct-19) OVERALL LEVEL .046 In/Sec 11 - Motor OB HOR 21 - Motor IB HOR .051 In/Sec 23 - Motor IB AXIAL .150 In/Sec 71 - Compressor IB HOR .123 In/Sec 81 - Compressor OB Horiz .141 In/Sec 83 - Compressor OB Axial .064 In/Sec

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Clarification Of Vibration Units: Acc --> G-s PK Vel --> In/Sec PK \* - Indicates Data Has Date/Time Different From Machine Date/Time