

March 23, 2020

ARKEMA

Subject: March week 3 vibration service report

## Weekly Equipment

## C Concentrator Vacuum Pump 2130-1

The pump axial vibration has dropped considerably; the outboard radial is steady at 0.177"/sec velocity. No action is required.

## Agitator, Hydrogenator C 7001-01

No legitimate vibrations were found to be above 0.158"/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 increased for the outboard pump bearing and is at 0.354"/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 appear to be normal this survey. No actions required.

## Air Compressor C-201

Rotor bar vibrations are at 1.84 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

Rotor bar vibrations are under 1g RMS. The trend clearly shows that the vibrations vary considerably over time. No actions required.

## Air Compressor C-203

Rotor bar vibrations are under 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. No actions required.

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

#### Instrument Air Compressor new

Vibration appeared to be about normal at near 0.28"/sec velocity peak for the female shaft. **Rated a Class I 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 relubrication 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 0.278"/sec velocity peak, 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 at 0.269"/sec velocity peak for the gearbox top E/W measurement. **Still rated a Class I Defect.** 

## Monthly Equipment

On the week 4 report.

*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. 5: ARK WK 3 Report Date: 23-Mar-20 12:13 MEASUREMENT POINT OVERALL LEVEL HFD / VHFD \_\_\_\_\_ \_\_\_\_\_ \_\_\_\_\_ (20-Mar-20) 2130-1old - C Concentrator Vacuum Pump OVERALL LEVEL 11 - Motor OB HOR .069 In/Sec 21 - Motor IB HOR .073 In/Sec 23 - Motor IB AXIAL .119 In/Sec 71 - Compressor IB HOR .140 In/Sec .169 In/Sec 81 - Compressor OB Horiz 83 - Compressor OB Axial .090 In/Sec 7000-01 - AGITATOR, HYDROGENATOR C (20-Mar-20) OVERALL LEVEL .046 In/Sec - DRIVESHAFT BRG-NORTH-SOUTH 01 02 - DRIVESHAFT BRG-EAST-WEST .046 In/Sec .046 In/Sec .046 In/Sec .046 In/Sec .076 In/Sec .052 In/Sec .053 In/Sec .067 In/Sec .085 In/Sec .067 In/Sec .053 In/Sec 03 - DRIVESHAFT BRG-VERTICAL 11 - C Hydro Agitator MOTOR OB HORIZ - C Hydro Agitator MOTOR OB VERT 12 - C Hydro Agitator Motor OB Axial 13 21 - C Hydro Agitator MOTOR IB HORIZ 22 - C Hydro Agitator MOTOR IB VERT 23 - C Hydro Agitator Motor IB Axial 31 - C Hydro Agitator GrBx In Horizon 32 - C Hydro Agitator GrBx In VERT 33 - C Hydro Agitator GrBx In Axial .067 In/Sec .053 In/Sec .061 In/Sec .040 In/Sec 41 - C Hydro Agitator GrBx Top Horizo 41 - C Hydro Agitator GrBx Top VERT .040 In/Sec 53 - C Hydro Agitator GrBx Top Axial .158 In/Sec 156 In/Sec .156 53L - C Hydro Agitator GrBx Top Axial .156 In/Sec 57 - A/B Concentr Vac Pmp-var RPM (20-Mar-20) OVERALL LEVEL 11 - Motor OB HOR .055 In/Sec 12 - Motor OB VERT .059 In/Sec 21 - Motor IB HOR .077 In/Sec 23 - Motor IB AXIAL .065 In/Sec 71 - Compressor IB HOR .155 In/Sec .354 In/Sec 81 - Compressor OB Horiz 83 - Compressor OB Axial .048 In/Sec 2130-1 - FLASH VAP VAC PUMP-var speed (20-Mar-20) OVERALL LEVEL 11 - Motor OB HOR .049 In/Sec 12 - Motor OB VERT .032 In/Sec .039 In/Sec 21 - Motor IB HOR 22 - Motor IB VERT .048 In/Sec 23 - Motor IB AXIAL .056 In/Sec

71 - Compressor IB HOR 72 - Compressor IB VERT 81 - Compressor OB Horiz 82 - Compressor OB VERT 83 - Compressor OB Axial C-203 - C-203 Comp 11 - MOTOR OB HOR 12 - MOTOR OB VERT 21 - MOTOR IB HOR 22 - MOTOR IB VERT 23 - MOTOR IB AXIAL 71M - COMP MALE SHAFT IB HOR 72M - COMP MALE SHAFT IB VERT 73M - COMP MALE SHAFT IB AXIAL 81M - COMP MALE SHAFT OB HOR 82M - COMP MALE SHAFT OB VERT 71F - COMP FEMALE SHAFT IB HOR 72F - COMP FEMALE SHAFT IB VERT 73F - COMP FEMALE SHAFT IB AXIAL 81F - COMP FEMALE SHAFT OB HOR 82F - COMP FEMALE SHAFT OB VERT C-202 - C-202 Comp 11 - MOTOR OB HOR 12 - MOTOR OB VERT 21 - MOTOR IB HOR 22 - MOTOR IB VERT 23 - MOTOR IB AXIAL 71M - COMP MALE SHAFT IB HOR 72M - COMP MALE SHAFT IB VERT 73M - COMP MALE SHAFT IB AXIAL 81M - COMP MALE SHAFT OB HOR 82M - COMP MALE SHAFT OB VERT 71F - COMP FEMALE SHAFT IB HOR 72F - COMP FEMALE SHAFT IB VERT 73F - COMP FEMALE SHAFT IB AXIAL 81F - COMP FEMALE SHAFT OB HOR 82F - COMP FEMALE SHAFT OB VERT C-201 - C-201 Comp 11 - MOTOR OB HOR 12 - MOTOR OB VERT 21 - MOTOR IB HOR 22 - MOTOR IB VERT 23 - MOTOR IB AXIAL 71M - COMP MALE SHAFT IB HOR 72M - COMP MALE SHAFT IB VERT 73M - COMP MALE SHAFT IB AXIAL 81M - COMP MALE SHAFT OB HOR 82M - COMP MALE SHAFT OB VERT 71F - COMP FEMALE SHAFT IB HOR 72F - COMP FEMALE SHAFT IB VERT 73F - COMP FEMALE SHAFT IB AXIAL

| .063<br>.075<br>.078<br>.094 | In/Sec<br>In/Sec<br>In/Sec<br>In/Sec |   |       |     |
|------------------------------|--------------------------------------|---|-------|-----|
| .050                         | In/Sec                               |   |       |     |
| (20-Mar-20)                  |                                      |   |       |     |
| OVERAL                       | - /~                                 | T | -20   | KHZ |
| .020                         | In/Sec                               |   | . 366 | G-s |
| .029                         | In/Sec                               |   | .168  | G-s |
| .018                         | In/Sec                               |   | .324  | G-s |
| .033                         | In/Sec                               |   | .252  | G-s |
| .014                         | In/Sec                               |   | .093  | G-s |
| .035                         | In/Sec                               |   |       |     |
| .033                         | In/Sec                               |   |       |     |
| .075                         | In/Sec                               |   |       |     |
| .058                         | In/Sec                               |   |       |     |
| .032                         | In/Sec                               |   |       |     |
| .043                         | In/Sec                               |   |       |     |
| .037                         | In/Sec                               |   |       |     |
| .068                         | In/Sec                               |   |       |     |
| .034                         | In/Sec                               |   |       |     |
| .047                         | In/Sec                               |   |       |     |
| (20-Ma)                      | c-20)                                |   |       |     |
| OVERAI                       | LL LEVEL                             | 1 | -20 1 | KHz |
| .046                         | In/Sec                               |   | .394  | G−s |
| .111                         | In/Sec                               |   | .379  | G−s |
| .067                         | In/Sec                               |   | .458  | G−s |
| .053                         | In/Sec                               |   | .120  | G−s |
| .059                         | In/Sec                               |   | .497  | G-s |
| .048                         | In/Sec                               |   |       |     |
| .046                         | In/Sec                               |   |       |     |
| .090                         | In/Sec                               |   |       |     |
| .044                         | In/Sec                               |   |       |     |
| .058                         | In/Sec                               |   |       |     |
| .038                         | In/Sec                               |   |       |     |
| .073                         | In/Sec                               |   |       |     |
| .063                         | In/Sec                               |   |       |     |
| .045                         | In/Sec                               |   |       |     |
| .056                         | In/Sec                               |   |       |     |
| (20-Ma)                      | c-20)                                |   |       |     |
| OVERAI                       | LL LEVEL                             | 1 | -20 1 | KHz |
| .099                         | In/Sec                               | 1 | .327  | G−s |
| .082                         | In/Sec                               | 1 | .841  | G−s |
| .095                         | In/Sec                               |   | .611  | G−s |
| .047                         | In/Sec                               |   | .202  | G−s |
| .068                         | In/Sec                               |   | . 687 | G−s |
| .051                         | In/Sec                               |   |       |     |
| .044                         | In/Sec                               |   |       |     |
| .078                         | In/Sec                               |   |       |     |
| .059                         | In/Sec                               |   |       |     |
| .061                         | In/Sec                               |   |       |     |
| .050                         | In/Sec                               |   |       |     |
| .058                         | In/Sec                               |   |       |     |
| .074                         | In/Sec                               |   |       |     |

82F - COMP FEMALE SHAFT OB VERT.063 In/Sec054 Ta/Sec - INSTRUMENT AIR COMPRESSOR (20-Mar-20) new AC 1-20 km 1.432 G-s 838 G-s OVERALL LEVEL .167 In/Sec .117 In/Sec 11 - MOTOR OB HOR .838 G-s 12 - MOTOR OB VERT .11/ 11/500 .087 In/Sec 13 - MOTOR OB AXIAL .518 G-s .144 In/Sec 21 - MOTOR IB HOR 1.364 G-s 22- MOTOR IB VERT.080 In/Sec23- MOTOR IB AXIAL.049 In/Sec71F- COMP FEMALE SHAFT IB HOR.136 In/Sec72F- COMP FEMALE SHAFT IB VERT.193 In/Sec73F- COMP FEMALE SHAFT IB AXIAL.173 In/Sec81F- COMP FEMALE SHAFT OB HOR.144 In/Sec82F- COMP FEMALE SHAFT OB VERT.281 In/Sec71M- COMP FEMALE SHAFT OB AXIAL.153 In/Sec71M- COMP MALE SHAFT IB HOR.095 In/Sec72M- COMP MALE SHAFT IB VERT.162 In/Sec73M- COMP MALE SHAFT OB HOR.172 In/Sec81M- COMP MALE SHAFT OB HOR.172 In/Sec82M- COMP MALE SHAFT OB VERT.205 In/Sec83M- COMP MALE SHAFT OB AXIAL.181 In/Sec .080 In/Sec .760 G-s 22 - MOTOR IB VERT .809 G-s 201-08A - COMPRESSOR, NASH A 201-08A (20-Mar-20) OVERALL LEVEL OVERALL LEVEL11- Nash Compr A Motor OB Horiz.067 In/Sec12- Nash Compr A Motor OB Vertical.082 In/Sec13- Nash Compr A Motor OB Axial.137 In/Sec21- Nash Compr A Motor IB Horiz.089 In/Sec22- Nash Compr A Motor IB VERT.099 In/Sec23- Nash Compr A Motor IB AXIAL.150 In/Sec71- Nash Compr A COMP IB HORIZ.162 In/Sec72- Nash Compr A Compressor IB Verti.232 In/Sec73- Nash Compr A COMP OB HORIZ.159 In/Sec81- Nash Compr A Compressor OB Verti.255 In/Sec83- Nash Compr A Compressor OB Axial.152 In/Sec 9002-10 - D-HYDROGENATOR AGITATOR (20-Mar-20) OVERALL LEVEL11- MOTOR OUTBOARD HORIZONTAL.083 In/Sec21- MOTOR INBOARD HORIZONTAL.078 In/Sec23- motor inboard axial.042 In/Sec31- GEARBOX INPUT SHAFT -HORIZONTAL.186 In/Sec31L- GEARBOX INPUT SHAFT-N-S-LOW FRQ.188 In/Sec51- GEARBOX TOP PLATE- E-W.283 In/Sec51L- GEARBOX OUTPUT SHAFT-E-W-LOW FRQ.265 In/Sec52- GEARBOX OUTPUT SHAFT-E-W-LOW FRQ.265 In/Sec52- GEARBOX OUTPUT SHAFT-E-W-LOW FRQ.257 In/Sec53- GEARBOX OUTPUT SHAFT -VERTICAL.122 In/Sec61- GEARBOX OUTPUT SHAFT -VERTICAL.214 In/Sec61L- GEARBOX OUTPUT SHAFT-E-W-LOW FRQ.181 In/Sec81- AGIT INTERMED BRG @ SEAL- N-S.041 In/Sec82- AGIT INTERMED BRG @ SEAL- E-W.054 In/Sec83- AGIT INTERMED BRG @ SEAL- VERT.038 In/Sec OVERALL LEVEL

Clarification Of Vibration Units: Acc --> G-s PK Vel --> In/Sec PK