

December 28, 2020

Arkema

Subject: December week 3/4 vibration service report

Most of the machines surveyed were found to be in good condition except for the following:

QualiTest® uses a four-step rating system for defects.

<u>Class I:</u> Defect is present, but effect on reliability is not clear; no immediate action is required. Continue to normally monitor.

<u>Class II:</u> Defect (s) present that may cause problem in long term (2-6 months.). Repair during normal maintenance scheduling. Continue to monitor.

<u>Class III</u>: Defect (s) present that may cause failure in short term (less than 2 months.). This should be addressed as soon as practical, with a high maintenance priority. Increase monitoring frequency.

<u>Class IV</u>; Defect (s) present that makes continued reliability unpredictable, and possibility of secondary damage is high. Repairs should be made ASAP. An unscheduled shutdown should be considered for repairs

*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 Specialists *Hi-Speed* Industrial Service dshook@gohispeed.com

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

### Weekly Route Critical Equipment Observations

### C Concentrator Vacuum Pump 2130-1

Vibrations appear to be slightly elevated this survey. Pump vibration is virtually unchanged at 0.162"/sec velocity peak for the outboard pump bearing. No actions required just yet.

### Agitator, Hydrogenator C 7001-01

The highest motor overall vibration is lower now at 0.109"/sec velocity peak for the inboard vertical. We will continue to monitor normally. Gearbox looks good.

## A/B Concentrator Vacuum Pump 57

The outboard pump bearing overall is 0.249"/sec peak velocity, with a dominant vibration at 16 orders, which is most likely vane pass. We will continue to watch for changes. **Rated a Class I Defect.** 

### Flash Vacuum Pump 2130-1

Vibrations appear to be normal this survey. All velocity measurements are below 0.10"/sec peak. No actions required.

### Air Compressor C-201

Rotor bar vibrations are normal for this motor's history. The trend clearly shows that the vibrations vary considerably over time but have risen considerably. We still believe these motors have possible weak rotor bar end connections that cause the vibrations to fluctuate higher due to loading. There are still blower case vibrations around 3 KHz. With a wide noise floor. We will continue to monitor this unit for changes. **Rated a Class I Defect**.

### Air Compressor C-202

Rotor bar vibrations are normal for this motor's history. The trend clearly shows that the vibrations vary considerably over time. We are still watching acceleration near 2500 Hz for the compressor section. **Rated a Class I Defect**. No immediate actions required at this time.

### Air Compressor C-203

Rotor bar vibrations are normal for this motor's history. The waterfall spectra clearly show 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 are still watching acceleration near 2500 Hz for the compressor section. We will continue to monitor this unit for changes. **Rated a Class II Defect**.

#### Instrument Air Compressor



The male and female shaft vibrations still seem to show gear mesh and harmonics as well as a beat vibration occasionally. They continue to vary over time. The female shaft inboard horizontal overall vibration is at 11 g's RMS. The dominant vibration appears to be the second gear mesh harmonic at near 2500 Hz. We are still watching this unit closely and will be going forward. **Rated a Class I Defect for now.** 

### Air Compressor NASH A 201-08A

Highest vibration is still in the pump itself at 0.303"/sec velocity peak for the outboard vertical. The vibration spectrum is still dominated by a 20-order vibration, which is thought to be vane pass. **Rated a Class I Defect.** 

### D Hydrogenator Agitator 9002-10

Vibration data shows a slight change in vibrations this survey. Highest overall vibration is 0.261"/sec velocity peak for the gearbox upper output bearing plate in the E/W direction. **Rated a Class I Defect.** No immediate issue.

### North Cooling Tower, South Fan

Motor overall outboard vibration is at 0.355"/sec velocity peak. The dominant resulting vibration is a beat vibration at about 2-3 Hz which was caused by two close peaks at near 30 and 32 Hz. The beat has a period of about 400ms. Inspect for possible causes such as loose, misaligned, or worn drive shaft components. **Rated a Class I Defect.** 

# South Cooling Tower, North Fan

The overall vibration is highest in the motor and is at 0.321"/sec velocity peak. 2 main vibration peaks under 100 Hz combine to elevate the overall. Inspect for possible causes such as loose, worn, or misaligned drive shaft components. **Rated a Class I Defect.** 

# South Cooling Tower, Middle Fan

This unit suffers from a beat vibration like the North fan on the North cooling tower but at the lower amplitude of 0.316"/sec velocity peak. Inspect as time allows. **Rated a Class I Defect.** 

# Hydrogen Monthly

# H2 FD Fan



The unit 1xRPM vibration has jumped up recently. Clean the fan wheel, inspect the bearings and coupling for wear. Confirm precision shaft alignment, and trim balance, as time allows. **Rated a Class I Defect.** 

# H2 ID Fan

The unit bearings show multiple harmonics of shaft speed in the data. Clean the fan wheel, inspect the bearings and coupling for wear. Confirm precision shaft alignment, and trim balance, as time allows. **Rated a Class I Defect.** 

#### H2 East Cooling Tower Pump

The pump input vertical is dominated by a shaft speed vibration at near 0.5:/sec velocity peak. We suspect a poor installation is at the root cause. Have the unit base leveled and grouted properly. Adjust piping to relieve any pipe stress and realign the shafts after the coupling is inspected. **Rated a Class II Defect.** 

Abbreviated Last Measurement Summary \* Database: Arkema.rbm Station: PEROXIDE Route No. 5: ARK WK 3/4 Report Date: 28-Dec-20 13:26 MEASUREMENT POINT OVERALL LEVEL HFD / VHFD -----\_\_\_\_\_ -----2130-1old - C Concentrator Vacuum Pump (28-Dec-20) 1-20 KHz OVERALL LEVEL .062 In/Sec .489 G-s .062 In/Sec .400 G-s 11 - Motor OB HOR 

 .062
 In/Sec
 .469
 G-s

 .102
 In/Sec
 .400
 G-s

 .109
 In/Sec
 .173
 G-s

 .123
 In/Sec
 .906
 G-s

 .162
 In/Sec
 .734
 G-s

 .083
 In/Sec
 1.496
 G-s

21 - Motor IB HOR 23 - Motor IB AXIAL 71 - Compressor IB HOR 81 - Compressor OB Horiz 83 - Compressor OB Axial 7000-01 - AGITATOR, HYDROGENATOR C (28-Dec-20) OUT-OFAGTINION, HIDROGENATION COVERALL LEVEL1-20 KHZ02- DRIVESHAFT BRG-EAST-WEST.043 In/Sec.017 G-s03- DRIVESHAFT BRG-VERTICAL.047 In/Sec.016 G-s11- C Hydro Agitator MOTOR OB HORIZ.072 In/Sec.774 G-s12- C Hydro Agitator MOTOR OB VERT.067 In/Sec.587 G-s13- C Hydro Agitator MOTOR OB VERT.067 In/Sec.343 G-s21- C Hydro Agitator MOTOR IB HORIZ.072 In/Sec.299 G-s22- C Hydro Agitator MOTOR IB VERT.109 In/Sec.146 G-s23- C Hydro Agitator GrBx In Horizon.093 In/Sec.654 G-s31- C Hydro Agitator GrBx In VERT.077 In/Sec.873 G-s33- C Hydro Agitator GrBx In Axial.054 In/Sec.236 G-s341- C Hydro Agitator GrBx In Axial.054 In/Sec.1187 G-s33- C Hydro Agitator GrBx In Axial.052 In/Sec.593 G-s341- C Hy AG GBX INPUT OUTBOARD VERT.081 In/Sec.1187 G-s51- C Hydro GrBx shaft 2 Top HZ E-W.052 In/Sec.593 G-s53- C Hydro GrBx shaft 2 Top AXIAL.080 In/Sec.343 G-s61- C Hydro GrBx shaft 2 BOT HZ E-W.020 In/Sec.440 G-s51- C Hydro GrBx shaft 2 BOT HZ E-W.020 In/Sec.447 G-s51- C Hydro GrBx Shaft 2 BOT HZ E-W.020 In/Sec.343 G-s51- C Hydro GrBx OUTPUT TOP HZ E-W.024 In/Sec.380 G-s53- C Hydro GrBx OUTPUT TOP AXIAl.061 In/Sec. OVERALL LEVEL 1-20 KHZ - A/B Concentr Vac Pmp-var RPM (28-Dec-20) 57 OVERALL LEVEL1-20 KHz.044 In/Sec.241 G-s 11 - Motor OB HOR

12 - Motor OB VERT	.048 In/Sec	.227 G-s
21 - Motor IB HOR	.072 In/Sec	.198 G-s
23 - Motor IB AXIAL	.059 In/Sec	.130 G-s
71 - Compressor IB HOR	119 In/Sec	643 G-s
81 - Compressor OB Horiz	249 Tr/Sec	590 C-8
83 - Compressor OB Avial	050 In/Sec	.550 G S
85 - Compressor OB Axiai	.050 III/Sec	.000 G-S
2120-1 - FLACH VAD VAC DUMD-war speed	(28-Doc-20)	
2150-1 - FLASH VAP VAC POMP-Var speed		1 00 1711-
	OVERALL LEVEL	1-20 KHZ
11 - Motor OB HOR	.051 In/Sec	.235 G-s
12 - Motor OB VERT	.034 In/Sec	.265 G-s
21 - Motor IB HOR	.041 In/Sec	.263 G-s
22 - Motor IB VERT	.044 In/Sec	.294 G-s
23 - Motor IB AXIAL	.054 In/Sec	.214 G-s
71 - Compressor IB HOR	.064 In/Sec	.501 G-s
72 - Compressor IB VERT	.079 In/Sec	.696 G-s
81 - Compressor OB Horiz	.083 In/Sec	.227 G-s
82 - Compressor OB VERT	.082 In/Sec	.543 G-s
83 - Compressor OB Axial	.042 In/Sec	.491 G-s
C-203 - C-203 Comp	(28-Dec-20)	
_	OVERALL LEVEL	1-20 KHz
11 - MOTOR OB HOR	.025 In/Sec	.724 G-s
12 - MOTOR OB VERT	.032 In/Sec	.552 G-s
21 - MOTOR IB HOR	.108 In/Sec	2.896 G-s
22 - MOTOR TR VERT	077 In/Sec	2 658 G-s
23 - MOTOR TB AXTAL	032 Tn/Sec	376 G-s
	OVERALL LEVEL	1-20 KHZ
71M - COMP MALE SHAFT IN HOP		2 379 C-e
72M - COMP MALE SHAFT IB NOR	059 In/Sec	2.373 G 3
72M COMP MALE SHAFT ID VERI		2.402 G-S
15M - COMP MALE SHAFT ID AXIAL		2.304 G-S
SIM - COMP MALE SHAFT OB HOR	.039 IN/Sec	2.761 G-S
82M - COMP MALE SHAFT OB VERT	.0/0 IN/Sec	3.852 G-S
/IF - COMP FEMALE SHAFT IB HOR	.06/ In/Sec	2.936 G-S
72F - COMP FEMALE SHAFT IB VERT	.079 In/Sec	3.041 G-s
73F - COMP FEMALE SHAFT IB AXIAL	.105 In/Sec	5.482 G-s
81F - COMP FEMALE SHAFT OB HOR	.071 In/Sec	4.076 G-s
82F - COMP FEMALE SHAFT OB VERT	.070 In/Sec	2.830 G-s
C-202 - C-202 Comp	(28-Dec-20)	
	OVERALL LEVEL	1-20 KHz
11 - MOTOR OB HOR	.029 In/Sec	.329 G-s
12 - MOTOR OB VERT	.109 In/Sec	.165 G-s
21 - MOTOR IB HOR	.068 In/Sec	.587 G-s
22 - MOTOR IB VERT	.131 In/Sec	5.216 G-s
23 - MOTOR IB AXIAL	.113 In/Sec	3.250 G-s
	OVERALL LEVEL	1-20 KHZ
71M - COMP MALE SHAFT IB HOR	.046 In/Sec	1.575 G-s
72M - COMP MALE SHAFT IB VERT	.049 In/Sec	1.292 G-s
73M - COMP MALE SHAFT IB AXIAL	.080 In/Sec	1.785 G-s
81M - COMP MALE SHAFT OB HOR	.059 In/Sec	2.074 G-s
82M - COMP MALE SHAFT OB VERT	.078 In/Sec	3.399 G-s
71F - COMP FEMALE SHAFT TE HOR	.056 In/Sec	2.119 G-e
72F - COMP FEMALE SHAFT IB VERT	.056 In/Sec	1.457 G-e
73F - COMP FEMALE SHAFT TE AYTAL	.098 Tn/Sec	5.222 6-6
81F - COMP FEMALE SHAFT OR HOP	063 In/Sec	2 461 C-S
82F - COMP FEMALE SHAFT OF VERT	067  Tr/800	1 929 6-5
OZE COME FEMALE SHAFT OD VERT	.007 11/360	1.920 G-S

C-201	- C-201 Comp	(28-Dec-20)	
		OVERALL LEVEL	1-20 KHz
11 -	MOTOR OB HOR	.094 In/Sec	1.341 G-s
12 -	MOTOR OB VERT	.067 In/Sec	1.069 G-s
21 -	MOTOR IB HOR	.122 In/Sec	3.437 G-s
22 -	MOTOR IB VERT	.050 In/Sec	.906 G-s
23 -	MOTOR IB AXIAL	.055 In/Sec	1.309 G-s
		OVERALL LEVEL	1-20 KHZ
71M -	COMP MALE SHAFT IB HOR	.052 In/Sec	2.885 G-s
72M -	COMP MALE SHAFT IB VERT	.065 In/Sec	2.551 G-s
73M -	COMP MALE SHAFT IB AXIAL	.079 In/Sec	3.035 G-s
81M -	COMP MALE SHAFT OB HOR	.083 In/Sec	4.336 G-s
82M -	COMP MALE SHAFT OB VERT	.072 In/Sec	1.979 G-s
71F -	COMP FEMALE SHAFT IB HOR	.056 In/Sec	2.553 G-s
72F -	COMP FEMALE SHAFT IB VERT	.051 In/Sec	1.474 G-s
73F -	COMP FEMALE SHAFT IB AXIAL	.047 In/Sec	1.428 G-s
81F -	COMP FEMALE SHAFT OB HOR	.083 In/Sec	3.186 G-s
82F -	COMP FEMALE SHAFT OB VERT	.081 In/Sec	2.596 G-s
new A	C - INSTRUMENT AIR COMPRESSOR	(28-Dec-20)	
		OVERALL LEVEL	1-20 KHz
11 -	MOTOR OB HOR	.159 In/Sec	1.188 G-s
12 -	MOTOR OB VERT	.108 In/Sec	.659 G-s
13 -	MOTOR OB AXIAL	.083 In/Sec	.501 G-s
21 -	MOTOR IB HOR	.146 In/Sec	1.323 G-s
22 -	MOTOR IB VERT	.078 In/Sec	.917 G-s
23 -	MOTOR IB AXIAL	.046 In/Sec	.656 G-s
		OVERALL LEVEL	1-20 KHZ
71F -	COMP FEMALE SHAFT IB HOR	.306 In/Sec	11.06 G-s
72F -	COMP FEMALE SHAFT IB VERT	.153 In/Sec	3.863 G-s
73F -	COMP FEMALE SHAFT IB AXIAL	.194 In/Sec	6.153 G-s
81F -	COMP FEMALE SHAFT OB HOR	.131 In/Sec	2.680 G-s
82F -	COMP FEMALE SHAFT OB VERT	.253 In/Sec	7.124 G-s
83F -	COMP FEMALE SHAFT OB AXIAL	.229 In/Sec	6.026 G-s
71M -	COMP MALE SHAFT IB HOR	.137 In/Sec	5.457 G-s
72м -	COMP MALE SHAFT IB VERT	.200 In/Sec	7.605 G-s
73М -	COMP MALE SHAFT IB AXIAL	.116 In/Sec	5.776 G-s
81M -	COMP MALE SHAFT OB HOR	.196 In/Sec	6.571 G-s
82M -	COMP MALE SHAFT OB VERT	.256 In/Sec	5.125 G-s
83м -	COMP MALE SHAFT OB AXIAL	.190 In/Sec	.873 G-s
		·	
201-0	8A - COMPRESSOR, NASH A 201-08A	(28-Dec-20)	
		OVERALL LEVEL	1-20 KHz
11 -	Nash Compr A Motor OB Horiz	.073 In/Sec	.224 G-s
12 -	Nash Compr A Motor OB Vertical	.079 In/Sec	.136 G-s
13 -	Nash Compr A Motor OB Axial	148 In/Sec	.098 G-s
21 -	Nash Compr A Motor TB Horiz	090 In/Sec	118 G-s
22 -	Nash Compr A Motor IB VERT	095 In/Sec	132 G-s
23 -	Nash Compr A Motor TB AXIAL	152 In/Sec	168 G-s
71 -	Nash Compr A COMP IB HORIZ	.162 In/Sec	.505 G-s
72 -	Nash Compr A Compressor TR Verti	256 Tr/Sec	1 298 6-9
73 -	Nash Compr A COMP TR AYTAL	149  Tr/Sec	199 6-9
81 -	Nash Compr A COMP OB HORTZ	195  Tr/Sec	295 G-s
82 -	Nash Compr A Compressor OB Verti	303  Tr/Sec	319 6-9
83 -	Nash Compr A Compressor OB Avial	161  Tr/Sec	451 6-9
55			

9002-10 - D-HYDROGENATOR AGITATOR (28-Dec-20) OVERALL LEVEL 1-20 KHz 11 - MOTOR OUTBOARD HORIZONTAL .097 G-s .085 In/Sec 11- MOTOR OUTBOARD HORIZONTAL.085 In/Sec21- MOTOR INBOARD HORIZONTAL.064 In/Sec23- MOTOR INBOARD AXIAL.048 In/Sec31- GEARBOX INPUT SHAFT -HORIZONTAL.234 In/Sec51- GEARBOX TOP PLATE- E-W.261 In/Sec52- GEARBOX TOP PLATE- N-S.127 In/Sec53- GEARBOX OUTPUT TOP -VERTICAL.129 In/Sec61- GEARBOX BOTTOM E-W-HORIZONTAL.126 In/Sec81- AGIT INTERMED BRG @ SEAL- N-S.035 In/Sec82- AGIT INTERMED BRG @ SEAL- VERT.035 In/Sec .038 G-s .065 G-s .604 G-s .196 G-s .268 G-s .661 G-s .152 G-s 

 81
 - AGIT INTERMED BRG @ SEAL- N-S

 82
 - AGIT INTERMED BRG @ SEAL- E-W

 83
 - AGIT INTERMED BRG @ SEAL- VERT

.024 G-s .023 G-s .169 G-s NTC-SF - N CT-SOUTH FAN, N TWR (28-Dec-20) 
 OVERALL LEVEL
 1-20 KHz

 .355 In/Sec
 .548 G-s

 .188 In/Sec
 .478 G-s

 .215 In/Sec
 .478 G-s
 - MOTOR OB HORIZ 1 - MOTOR IB HORIZ 2 .188 In/Sec .478 G-s .215 In/Sec .478 G-s OVERALL LEVEL 1-20 KHZ .227 In/Sec .427 G-s .0034 In/Sec .0012 G-s .303 In/Sec .398 G-s 3 - MOTOR IB AXIAL - GEARBOX INPUT HORIZONTAL 4 5 - GEARBOX VERTICAL .303 In/Sec .289 In/Sec .398 G-s .384 G-s - GEARBOX AXIAL 6 6L – GEARBOX AXIAL LOW FREQ NCT - NF - N CT -NORTH FAN, N TWR (28-Dec-20) OVERALL LEVEL 1-20 KHz .281 G-s 7 - MOTOR OB HORIZ .094 In/Sec .252 G-s 8 - MOTOR IB HORIZ .086 In/Sec .086 In/Sec .252 G-s .121 In/Sec .230 G-s OVERALL LEVEL 1-20 KHZ .230 G-s 9 - MOTOR IB AXIAL .138 In/Sec .080 In/Sec .159 G-s 10 - GEARBOX INPUT HORIZONTAL - GEARBOX VERTICAL .162 G-s 11 12 - GEARBOX AXIAL .131 In/Sec .187 G-s 530-02 - PUMP, N. COOLING TWR, MIDDLE (28-Dec-20) OVERALL LEVEL1-20 KHz.108 In/Sec.651 G-s .651 G-s 11 - MOT TOP N-S 12 - MOTOR TOP E-W .148 In/Sec .488 G-s 530-03 - PUMP, N. COOLING TWR, SOUTH (28-Dec-20) OVERALL LEVEL 1-20 KHz .532 G-s .099 In/Sec 11 - MOT TOP N-S 12 - MOTOR TOP E-W .134 In/Sec .459 G-s 548-7 - IRON-FREE H2O BOOSTER PUMP (28-Dec-20) 
 OVERALL LEVEL
 1-20 KHz

 .017 In/Sec
 .308 G-s

 .019 In/Sec
 .822 G-s

 .050 In/Sec
 .320 G-s

 .062 In/Sec
 .088 G-s
 11 - MOTOR OUTBOARD HORIZONTAL 21 - MOTOR INBOARD HORIZONTAL 23 - MOTOR INBOARD AXIAL 71 - PUMP HORIZONTAL 72 - PUMP VERTICAL .043 In/Sec .132 G-s STC-NF - S CT - NORTH FAN, S TWR (28-Dec-20) 
 OVERALL LEVEL
 1-20 KHz

 .321 In/Sec
 .593 G-s

 .259 In/Sec
 .566 G-s
 1 - MOTOR OB HORIZ 2 - MOTOR IB HORIZ

1	Vel>	In/Sec	PK	1	Abbreviated	Last N	leasurement
	Acc>	G-s	PK				
Cla	rification Of	Vibratic	on Units:				
12	- PUMP VERTI	ц <b>А</b> Г		.148	in/Sec	.583	G-S
71	- PUMP HORIZ	UNTAL		.180	IN/Sec	.541	G-S
23	- MOTOR INBO	ARD AXIAI		.068	In/Sec	. 392	G-s
21	- MOTOR INBO	ARD HORIZ	ZONTAL	.047	In/Sec	.472	G-s
11	- MOTOR OUTBO	OARD HORI	ZONTAL	.043	In/Sec	1.308	G-s
SCT	-3 - 500	TH CT PUN	17 - WEST	(28-Dec OVERAL	-∠U) L LEVEL	1-20 F	(Hz
	-3 001			(20 D			
72	- PUMP VERTT	CAL		.137	In/Sec	.888	G-s
71	- PUMP HORTZ	ONTAL	-	.145	In/Sec	. 405	G-s
23	- MOTOR INBO	ARD AXIAI		.109	In/Sec	.402	G-s
21	- MOTOR INBO	ARD HORTS	ZONTAL	.034	In/Sec	1.252	G-s
11	- MOTOR OUTB	OARD HORI	ZONTAL	.037	In/Sec	1.653	G-s
SCT	-2 - SOU	TH CT PUN	1P - MID	(28-Dec OVERAL	-20) L LEVEL	1-20 F	KHz
12	- PUMP VERTI	CAL		.0/1	in/Sec	. 730	G-S
/1	- PUMP HORIZ	ONTAL		.111	IN/Sec	.945	G-S
23	- MOTOR INBO	AKU AXIAI	-	.043	IN/Sec	.415	G-S
21	- MOTOR INBO	ARD HORIZ	CONTAL	.038	In/Sec	1.355	G-S
11	- MOTOR OUTB	UARD HOR	LZONTAL	.037	in/Sec	.457	G-s
SCT	-1 - 500		HF - EAST	OVERAL	L LEVEL	1-20 F	CHz
<u>در</u>	-1 - 901	דיו ריד סיזא	10 - FAST	(28-000	-20)		
5	- GEARBOX VE	RTICAL		.185	In/Sec	. 689	G-s
4	- GEARBOX IN	PUT HORIZ	ZONTAL	.103	In/Sec	.576	G-s
6	- GEARBOX AX	IAL		.164	In/Sec	.513	G-s
				OVERAL	L LEVEL	1-20 F	KHZ
3	- MOTOR IB A	XIAL		.270	In/Sec	.093	G-s
2	- MOTOR IB H	ORIZ		.253	In/Sec	.217	G-s
1	- MOTOR OB H	ORIZ		.193	In/Sec	.368	G-s
STC	-SF - S C	t – South	I FAN, S TWR	(28-Dec OVERAL	-20) L LEVEL	1-20 F	(Hz
5	- GEARBOX VE	KTICAL		.086	IN/Sec	.490	G-S
4	- GEARBOX IN	PUT HORIZ	ZONTAL	.172	In/Sec	.432	G-s
6	- GEARBOX AX	IAL		.105	In/Sec	.300	G-s
~				OVERAL	L LEVEL	1-20 F	KHZ
3	- MOTOR IB A	XIAL		.134	In/Sec	.167	G-s
2	- MOTOR IB H	URIZ		.255	in/Sec	.113	G-S
1	- MOTOR OB H	ORIZ		.316	In/Sec	.434	G-s
-	VOTE: 05			OVERAL	L LEVEL	1-20 F	KHz
STC	-MF - S C	T - MID H	FAN, S TWR	(28-Dec	-20)		
4	- GEARBOX IN	PUT HORIZ	ZONTAL	.148	In/Sec	.468	G-s
6	- GEARBOX AX	IAL		.147	In/Sec	.362	G-s
				OVERAL	L LEVEL	1-20 F	KHZ

Database: Arkema.rbm

Station: HYDROGEN Route No. 1: H2 MONTHLY Report Date: 28-Dec-20 13:27

	MEASUREMENT POINT	OVERALL LEVEL	hfd / vhfd
P2A	- PUMP MEA CIRC WEST P2A	(28-Dec-20)	1-20 KH4
11	- West MEA Circ Dwo Mtr OB Herizon	078 Tp/Soc	166 C-S
21	- West MEA CITC PMp Mtr OB Horizon	.078 IN/Sec	.100 G-S
22	- west MEA CITC PMp MCI IB HOIIZON	.055 IN/Sec	.130 G-S
23 71	- Most MEA Cing Dwp Dump TR Honizo	212 Tr/Sec	.235 G-S
71	- West MEA CITC Pmp Pump IB Horizo	.213 IN/Sec	.260 G-S
12	- pump vertical	.130 In/Sec	.700 G-S
P1A	- PUMP BFW WEST P1A	(28-Dec-20)	
		OVERALL LEVEL	1-20 KHz
11	- Mtr OB Horizo	.095 In/Sec	.220 G-s
21	- Mtr IB Horizo	.116 In/Sec	.789 G-s
23	- motor axial	.134 In/Sec	.430 G-s
71	- Pump IB HORIZ	.099 In/Sec	.885 G-s
72	- Pump IB Vertical	.116 In/Sec	.658 G-s
81	- Pump OB HORIZ	.149 In/Sec	.524 G-s
82	- Pump OB Vertical	.133 In/Sec	.502 G-s
83	- OB Axial	.133 In/Sec	.622 G-s
~~		(00 5.4 00)	
CZ	- FD BLOWER CZ	(28-Dec-20)	1 00 ****-
	T. D. Tan. Makan OD. Kanimankal	OVERALL LEVEL	1-20 KHZ
11	- F.D.Fan Motor OB Horizontal	.253 In/Sec	.234 G-S
21	- F.D.Fan Motor 1 Horizontal	.248 In/Sec	.404 G-S
23	- F.D.Fan Motor AXIAL INBOARD	.188 In/Sec	.117 G-s
71	- F.D.Fan Coupling End Brg Horizon	.187 In/Sec	1.591 G-s
81	- F.D.Fan Fan End Brg Horizon	.198 In/Sec	1.091 G-s
C1	- ID -BLOWER C1	(28-Dec-20)	
		OVERALL LEVEL	1-20 KHz
11	- I.D.Fan Motor OB Horizontal	.138 In/Sec	.380 G-s
21	- I.D.Fan Motor IB Horizontal	.158 In/Sec	.394 G-s
23	- motor inboard axial	.184 In/Sec	.288 G-s
71	- I.D.Fan Coupling End Horizontal	.135 In/Sec	1.044 G-s
72	- I.D.Fan Coupling End VERTICAL	.085 In/Sec	1.236 G-s
81	- I.D.Fan Fan End Horizontal	.246 In/Sec	1.096 G-s
82	- I.D.Fan Fan End VERTICAL	.222 In/Sec	.810 G-s
CTP	- EAST COOLING TOWER PUMP	(28-Dec-20)	
-		OVERALL LEVEL	1-20 KHz
11	- MOTOR OUTBOARD HORIZONTAL	265 In/Sec	808 G-s
21	- MOTOR INBOARD HORIZONTAL	.065 In/Sec	.272 G-s
23	- MOTOR INBOARD AXIAL	.233 In/Sec	1.392 G-s
71	- PUMP HORIZONTAL	.195 In/Sec	.393 G-s
72	- PUMP VERTICAL	.496 In/Sec	.449 G-s
000		(28 Dec 20)	
CTP	- WEST COOLING TOWER PUMP		1 00 ****-
		OVERALL LEVEL	1-20 KHZ
71	- MOTOR OUTBOARD HORIZONTAL	.106 In/Sec	.384 G-S
21	- MOTOK INBOARD HORIZONTAL	.104 In/Sec	.504 G-s
23	- MOTOR INBOARD AXIAL	.072 In/Sec	.739 G-s

71	- PUMP HORIZONTAL	.150 In/Sec	.909 G-s
72	- PUMP VERTICAL	.176 In/Sec	1.022 G-s

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Clarificati	on Of	Vibratio	on Units:
Acc	>	G-s	PK
Vel	>	In/Sec	PK